YAMAHA

MUSIC SYNTHESIZER

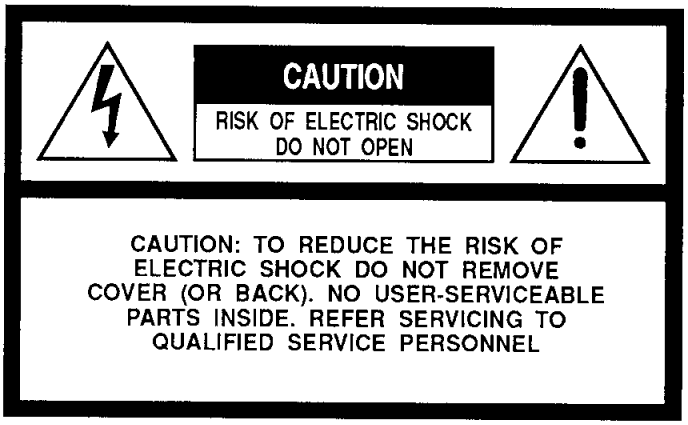
SY55

OPERATING MANUAL

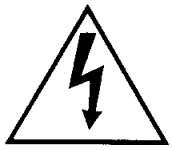
SUPPLEMENTAL MARKING INFORMATION

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

YAMAHA Digital Musical Instrument Products will have either a label similar to the graphic shown below or a molded/ stamped facsimile of the graphic on its enclosure. The explanation of these graphics appears on this page. Please observe all cautions indicated.



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



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

FCC INFORMATION (USA)

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 or 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 a 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.

* This applies only to products distributed by YAMAHA CORPORATION OF AMERICA.

IMPORTANT NOTICE FOR THE UNITED KINGDOM

Connecting the Plug and Cord

IMPORTANT. The wires in this mains lead are coloured in accordance with the following code:

BLUE : NEUTRAL

BROWN : LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

* This applies only to products distributed by YAMAHA-KEMBLE MUSIC (U.K.) LTD.

CANADA

THIS APPARATUS COMPLIES WITH THE "CLASS B" LIMITS FOR RADIO NOISE EMISSIONS SET OUT IN RADIO INTERFERENCE REGULATIONS.

CET APPAREIL EST CONFORME AUX NORMES "CLASS B", POUR BRUITS RADIOELECTRIQUES, TEL QUE SPECIFIE DANS LE REGLEMENT SUR LE BROUILLAGE RADIOELECTRIQUE.

* This applies only to products distributed by YAMAHA CANADA MUSIC LTD.

SY55 Music Synthesizer

Operating Manual

Congratulations!

Your YAMAHA SY55 Music Synthesizer features a breakthrough voice architecture that allows extensive sample layering and programmable dynamic timbre variation. With the SY55, individual sampled "waves" — either those pre-programmed in ROM or others available via plug-in waveform cards — are building blocks that you arrange and process with a sophisticated dynamic filter system to create sound that's a perfect match for your music. You also have pitch envelope generators, amplitude envelope generators, a range of 34 programmable effects, real-time sound control via a range of controllers, and a wealth of other ways to customize your sound. Add to all this a sophisticated 8-track sequencer, and you have a complete music production workstation as well as an outstanding performance tool.

The SY55 is one digital synthesizer that puts samples in their proper place. Rather than rigid sounds that limit the musical outcome, the SY55's samples are flexible tools that the musician can shape, color and combine to create an original world of sound.

MAIN FEATURES

- Second-generation 16-bit AWM2 (Advanced Wave Memory) technology for superior sound.
- Versatile 1, 2, or 4-element voice architecture and complex envelope generators for extensive sample layering capability.
- Sophisticated dynamic filter system offers unlimited real-time timbre variation.
- 74 waveform samples in ROM.
- 64 preset voices in ROM.
- 64-voice internal RAM memory.
- External waveform and voice card slots.
- Multi-play mode allows independent control of up to 16 voices.
- 16 memory locations for multi-play setups.
- Drum voices allow 61 different drum and other waveforms to be assigned to different keys.
- Sophisticated built-in 8-track sequencer takes full advantage of the multi-play mode and drum-set voices.
- Velocity switching for expressive power.
- Extensive voice editing functions.
- Keyboard initial and after touch response.
- A range of controllers: pitch wheel, modulation wheel, continuous slider, breath controller jack, foot volume jack, sustain switch jack.
- 34 high-quality programmable digital effects built in.
- Stereo output.

Contents

* See these pages for local tables of contents.

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 — including the AC cord — 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

The power requirements for the SY55 are clearly marked on the rear panel. Make sure the specified mains voltage matches the voltage in your area before using the unit!

8. Electrical Interference

Since the SY55 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 SY55 further away from the affected equipment.

9. Memory Backup

The SY55 contains a special long-life battery that retains the contents of its internal RAM memory even when the power is turned OFF. The backup battery should last for approximately 5 years. When the battery voltage drops to a level that is too low to maintain the memory contents, the following message will appear on the SY55 display when the power is turned ON:

```
ERROR! Hit"EXIT"
Internal Bat.Lo
```

If this display appears, have the backup battery replaced by qualified YAMAHA service personnel. DO NOT ATTEMPT TO REPLACE THE BACKUP BATTERY YOURSELF!

HOW TO USE THIS OPERATIONAL MANUAL

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

What's In the TUTORIALS Section

The TUTORIALS section contains five separate tutorials that take you step-by-step through the main procedures you will need to know to become familiar with your SY55:

1. SETTING UP YOUR SYSTEM [Page 11]
   Basic system connections.
2. SELECTING AND PLAYING VOICES [Page 13]
   Selecting and playing voices from the PRESET, INTERNAL and CARD voice banks.
3. THE MULTI PLAY MODE [Page 19]
   Creating multi-voice setups for use with the SY55 sequencer.
4. RECORDING & PLAYBACK WITH THE SEQUENCER [Page 27]
   Using the SY55's internal sequencer to record and play back your original compositions.
5. EDITING VOICES [Page 35]
   The basic information you need to know about the AWM2 tone generation system in order to edit voices quickly and efficiently, and general procedure for editing and creating new voices.

We recommend that you go through the tutorials in sequence while actually carrying out the procedures on your SY55. Once you've gone through the entire TUTORIALS section in this way, you should be familiar enough with the SY55 to need only the REFERENCE section in future.

What's In the REFERENCE Section

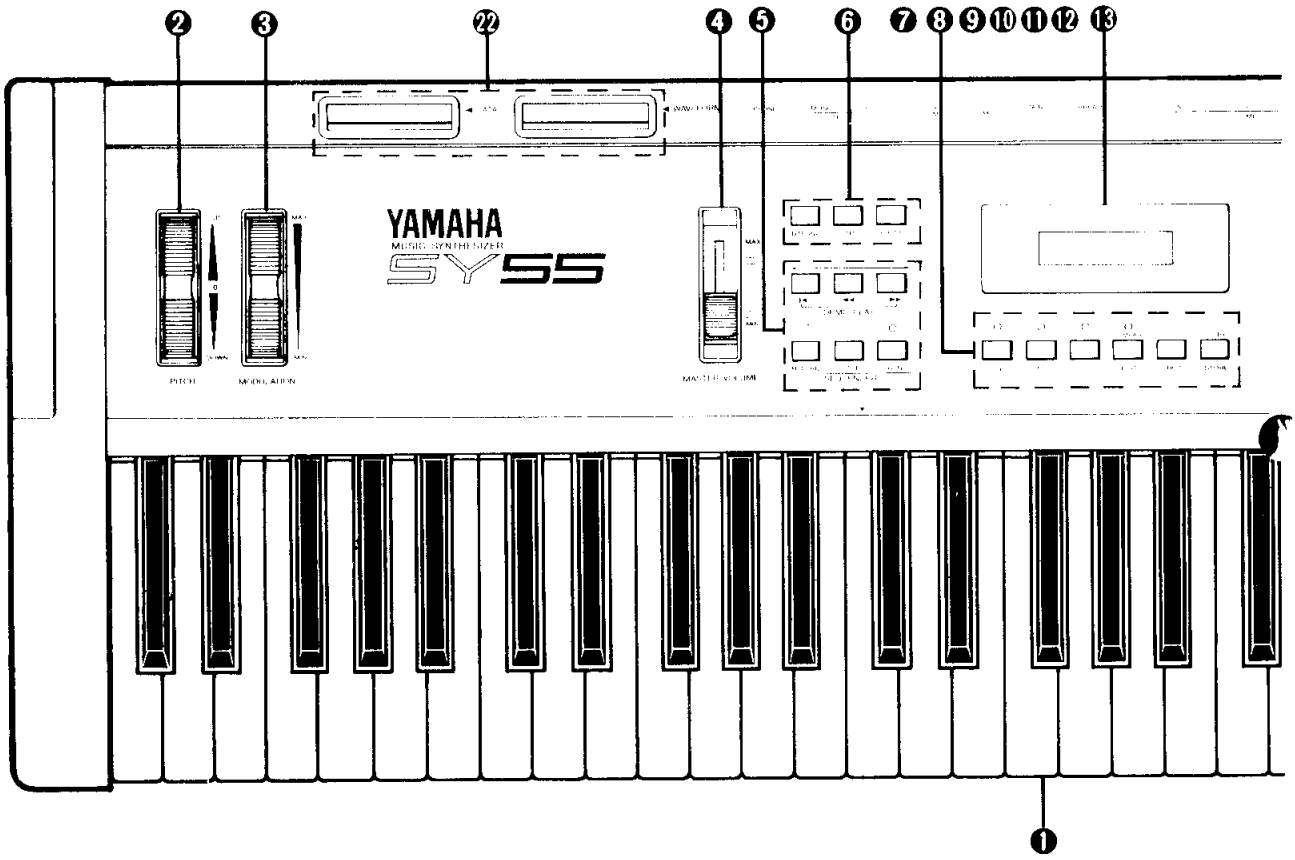
The REFERENCE section is the "nuts and bolts" section of the manual, individually describing each of the SY55's many functions or "jobs" in detail. The REFERENCE section is divided into five sub-sections, each describing the various jobs within a particular SY55 mode.

1. VOICE EDIT MODE [Page 50]
2. DRUM EDIT MODE [Page 92]
3. MULTI EDIT MODE [Page 104]
4. SEQUENCER MODE [Page 118]
5. UTILITY MODE [Page 130]

Once you have become completely familiar with the way the SY55 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 jobs you've never used before, or refresh your memory about jobs 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 job quickly and easily. Functions and references can also be located by referring to the INDEX at the back of the manual.

■ FRONT PANEL



❶ **Keyboard** — The SY55 keyboard is both velocity and after-touch sensitive for broad expressive control.

❷ **[PITCH] Wheel** — This self-cenetering pitch bend wheel allows smooth upward and downward pitch bends.

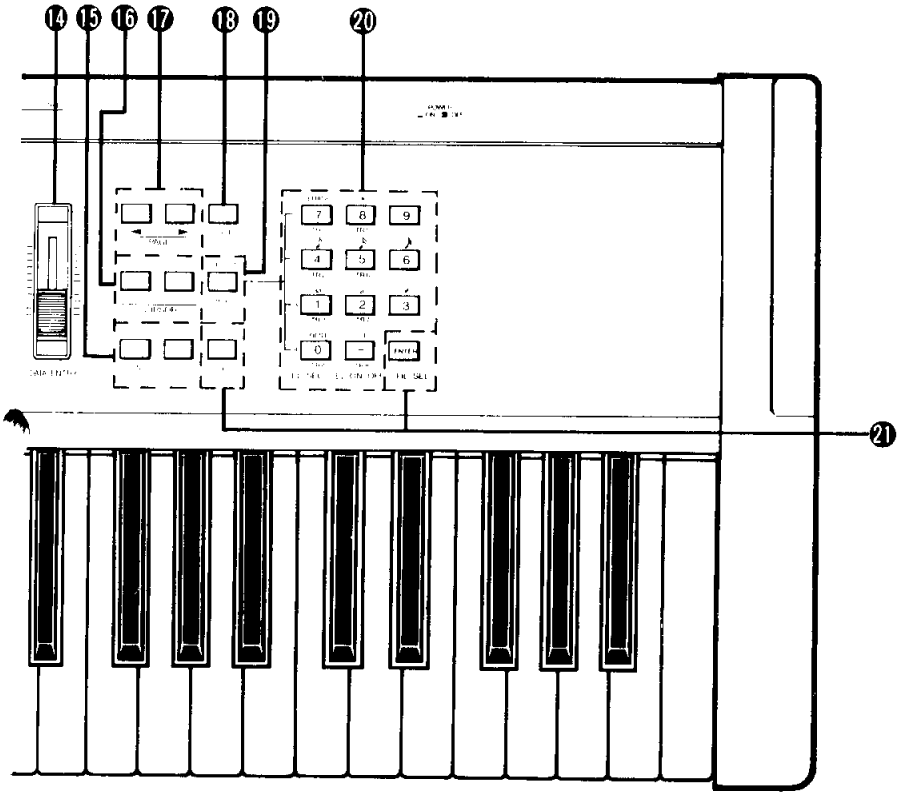
❸ **[MODULATION] Wheel** — Can be assigned to apply pitch modulation, amplitude modulation, cutoff modulation, envelope generator bias, and other effects.

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

❺ **[SEQUENCER] Keys & Indicator** — Control the record, play and measure selection functions of the internal sequencer.

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

❼ **[VOICE] Key & Indicator** — Selects the normal voice play mode in which any of the SY55's preset, internal or card voices can be played via the keyboard or an external controller connected to the MIDI IN connector.



❽ [MULTI] Key & Indicator Selects the multi-play mode in which up to 16 voices can be controlled on 16 different MIDI channels via the SY55's internal sequencer or an external MIDI sequencer.

❾ [SEQ] Key & Indicator Selects the sequencer mode in which 8 independent tracks can be recorded and played back using the various instruments in one of the SY55 multi-play setups.

❿ [EDIT/COMPARE] Key & Indicator Activates the voice edit mode when a voice between 1 and 62 is selected, the drum edit mode when voice number 63 or 64 is selected, the multi-play edit mode if the multi-play mode is selected, or the sequencer edit mode if the sequencer mode is selected. Also activates the compare function in certain edit modes, allowing quick comparison of the original and edited voice or multi-play setup.

⓫ [UTILITY] Key Accesses the SY55 utility functions including MIDI parameters, master tuning, transposition, overall velocity curve selection, effect on/off switching, memory card formatting and save/load operations.

⓬ [STORE/COPY] Key Used to store edited data to an internal or card memory location. Also selects several handy data copy functions in the SY55 edit modes.

⑬ **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 job names and parameters in the sequencer, utility, and edit modes.

⑭ **[DATA ENTRY] Control**

The [DATA ENTRY] control is the fastest way to select a value or item from a large range when editing.

⑮ **[–1/NO] and [+1/YES] Keys**

Select voices and multi-play setups, and are used to edit parameter values in any of the SY55 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 "Sure?" confirmation prompt when saving or initializing data.

⑯ **[◁] and [▷] Cursor Keys**

Move the screen cursor from parameter to parameter in many of the SY55 editing functions.

⑰ **[PAGE ◄] and [PAGE ►] Keys**

These keys are used primarily to select the various function screens in the SY55 voice, multi-play, drum, and sequencer editing modes, as well as in the utility mode.

⑱ **[JOB] Key**

Allows fast, direct access to any of the SY55 voice, drum, multi-play, and sequencer editing jobs.

⑲ **[SELECT] Key**

Allows selection of voice elements and filters during voice editing, or track record and mute assignments in the sequencer mode.

⑳ **Numeric Keys**

The SY55 numeric keys allow direct selection of voices or multi-play setups, editing jobs and parameter values. These keys also function as track and note-length selectors in the sequencer mode.

㉑ **[ENTER] and [EXIT] Keys**

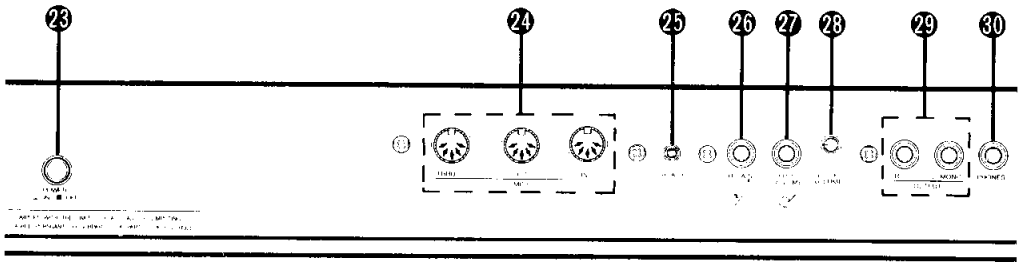
The [ENTER] key is used to enter job subsets while editing, initiate data save and initialize operations, start demo playback, etc. The [EXIT] allows you to immediately exit from editing job subsets, exit from any editing or utility mode, stop demo playback, etc.

㉒ **DATA and WAVEFORM Card Slots**

The DATA card slot accepts YAMAHA MCD64 or MCD32 Memory Cards for storage and retrieval of SY55 voices, multi-play setups and system data.

The WAVEFORM card slot accepts pre-programmed waveform cards — i.e. cards containing sets of sampled waveforms for use in SY55 voices.

■ REAR PANEL



㉓ [POWER] Switch

Press to turn power ON or OFF.

㉔ MIDI IN, OUT and THRU Connectors

The MIDI IN connector receives data from an external MIDI device which is to control the SY55. 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 SY55 performance or sequencer operations, or bulk data from the SY55 when one of the MIDI bulk dump functions are activated.

㉕ BREATH Jack

An optional YAMAHA breath controller can be pluggeed in here to allow wind-instrument type tounging and breath effects to be applied to appropriately programmed SY55 voices.

㉖ SUSTAIN Jack

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

㉗ FOOT VOLUME Jack

An optional YAMAHA FC-7 foot controller connected here can be used for volume control or other effects.

㉘ [CLICK VOLUME] Control

Adjusts the volume of the SY55 click metronome (used primarily in the sequencer mode).

㉙ OUTPUT R and L/MONO Jacks

These are the main stereo outputs from the SY55. 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).

㉚ PHONES Jack

Accepts a standard pair of stereo headphones (1/4" stereo phone plug) for headphone monitoring of the SY55 sound without the need for external amplification equipment.

TUTORIALS SECTION

TUTORIALS

Contents

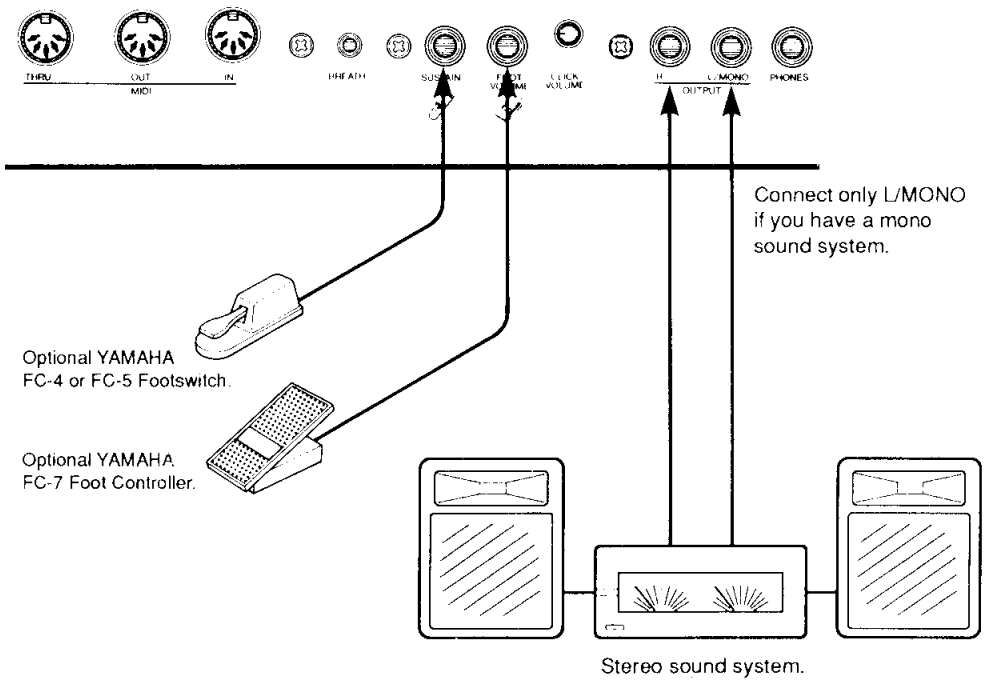
1. SETTING UP YOUR SYSTEM

Connections

Assuming that you will not be using the SY55 with other MIDI devices for the time being, your system should be set up as shown below.

CAUTION!!: Make sure that both the SY55 and your sound system are turned OFF when making connections.

SY55



If you do connect the SY55 to other MIDI devices, be sure to use high-quality MIDI cables of not longer than about 15 meters.

Power-on Procedure

1. Make sure that both your sound system's volume control and the SY55 [MASTER VOLUME] control are turned almost all the way down prior to turning power on.

2. Turn on the SY55.

3. Turn on the sound system.

4. Carefully adjust the SY55 [MASTER VOLUME] control and your sound system's volume control while playing one of the voices (see "SELECTING AND PLAYING VOICES' on page 13).

Enjoy the Demos

The SY55 is programmed with three demo tunes that you might enjoy listening to after setting up your system. Take a short break and enjoy the demos:

1. Press and then release the SEQUENCER [⏮] and [⏭] keys at the same time.

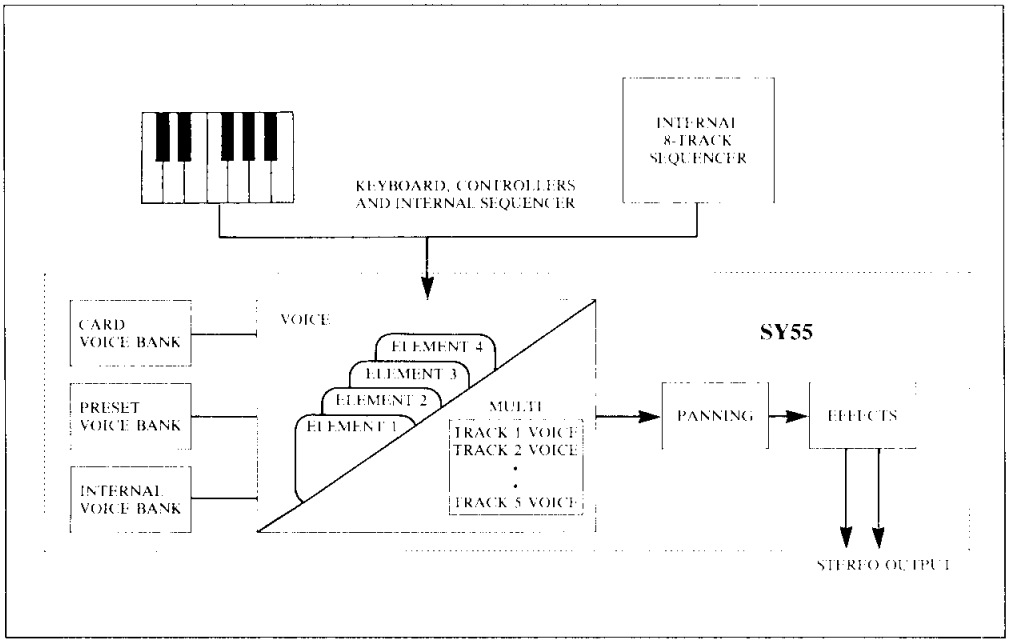
2. Press the [ENTER] key to start demo playback.

3. Press the [EXIT] key when you want to stop demo playback. Pressing [EXIT] a second time returns you to the mode the SY55 was in prior to the demo playback mode.

2. SELECTING AND PLAYING VOICES

The PRESET, INTERNAL and CARD Voice Banks

Here's a global view of the SY55 system:



Please note that the voices played by the SY55 can come from three different sources: the PRESET voice bank, the INTERNAL voice bank, or a CARD voice bank:

PRESET

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

INTERNAL

The INTERNAL voice bank 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 bank 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 SY55 DATA card slot on the front 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. The CARD voice bank is represented on the display by the letter "C" (the second bank of MCD64 cards is represented by a reversed "Ↄ").

Any voice in any of these voice banks can be selected and played while the SY55 is in the VOICE PLAY mode.

● PRESET VOICE LIST

No.	EL*	Name	No.	EL	Name	No.	EL	Name
1	1	Piano	23	4	Big Band	45	2	VCO Lead
2	2	Voyager	24	2	Orch Brass	46	2	Spirit VCF
3	2	Pro55Brass	25	2	SynthBrass	47	2	OZ Lead
4	2	Elektrodes	26	1	Flute	48	4	Get Lucky
5	4	Zuratustra	27	1	Saxophone	49	4	Gamma Band
6	2	DawnChorus	28	2	FolkGuitar	50	2	Metal Reed
7	2	GX Dream	29	2	12 String	51	4	Modomatic
8	2	GrooveKing	30	2	MuteGuitar	52	2	DataStream
9	4	DistGuitar	31	2	SingleCoil	53	2	Mystichoir
10	4	ZenAirBell	32	1	Pick Bass	54	2	St.Michael
11	2	FullString	33	2	Thumb Bass	55	2	Scatter
12	4	Jazz Man	34	2	SynBadBass	56	2	Triton
13	2	ClassPiano	35	2	VCO Bass	57	4	Amazon
14	2	Rock Piano	36	2	Violin	58	2	SatinGlass
15	1	DX E.Piano	37	1	ChamberStr	59	4	BrassChime
16	2	Hard EP	38	2	VCF String	60	2	Piano Mist
17	2	Cry Clav	39	2	Nova Quire	61	4	Xanadu
18	2	Funky Clav	40	2	Vibraphone	62	2	WdBass Duo
19	2	Deep Organ	41	2	Takerimba	63	(61)	Drum Set 1
20	2	Warm Organ	42	1	Gloken	64	(61)	Drum Set 2
21	1	Trumpet	43	2	DigiBell			
22	4	Stab Brass	44	2	Oriental			

* EL=Number of elements see page 35.

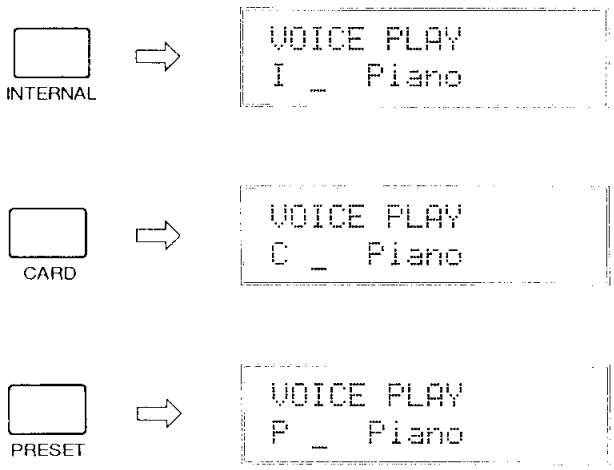
No.	Name	Comments
P01	Piano	Orthodox acoustic piano.
P02	Voyager	Choir with "sizzle." Play long chords.
P03	Pro55Brass	Fat analog brass pad.
P04	Elektrodes	Mellow electric piano.
P05	Zaratustra	Big orchestra. Brass volume on MW.
P06	DawnChorus	Breathy choir. MW fades out breath.
P07	GX Dream	A punchy voice reminiscent of the YAMAHA GX1.
P08	GrooveKing	Classic funky, resonant synth voice.
P09	DistGuitar	Heavy guitar. Slow fade to feedback.
P10	ZenAirBell	Percussive bell/gong combination.
P11	FullString	Light touch for small, heavy for large string section.
P12	JazzMan	Split wood bass and trumpet. MW swaps horns.
P13	ClassPiano	Classical Grand Piano
P14	RockPiano	Fat piano. Perfect for chord work.
P15	DX E.Piano	Electronic piano.
P16	Hard EP	Electric piano with sharp attack and hard tone.
P17	Cry Clav	Automatic "wah" clav with resonant attack.
P18	Funky Clav	Fat, funky clav.
P19	Deep Organ	Rock Organ
P20	Warm Organ	Full, rich organ with rotating speaker effect.
P21	Trumpet	Solo trumpet.
P22	Stab Brass	Thin pop brass section.
P23	Big Band	Big unison horn section. Play in octaves. MW fades to solo trumpet.
P24	Orch Brass	Big classical brass section with pan.

No.	Name	Comments
P25	SynthBrass	Powerful synth brass pad.
P26	Flute	Breathy when played hard.
P27	Saxophone	Solo sax with lots of presence.
P28	FolkGuitar	Steel-string acoustic folk guitar.
P29	12 String	Full 12-string guitar.
P30	MuteGuitar	Muted electric guitar.
P31	SingleCoil	Single-coil electric guitar pickup.
P32	Pick Bass	Punchy picked bass.
P33	Thumb Bass	Play hard for slap bass sound.
P34	SynBadBass	Funky synth bass.
P35	VCO Bass	Fat analog bass.
P36	Violin	Solo violin with after-touch vibrato.
P37	ChamberStr	Small violin section.
P38	VCF String	Analog synth strings. Brightness on MW.
P39	Nova Quire	Choir with a unique attack.
P40	Vibraphone	Traditional vibrophone with tremolo on MW.
P41	Takerimba	Bamboo marimba. Brightness on MW.
P42	Glocken	Glockenspiel. Brightness on MW.
P43	DigiBell	Spacious synth bell.
P44	Oriental	Oriental orchestra. Light touch for string section only.
P45	VCO Lead	Analog sawtooth lead voice.
P46	Spirit VCF	Analog synth with big, slow filter sweep.
P47	OZ Lead	Soft synth lead.
P48	Get Lucky	Fat square-wave synth sound with detune on MW.
P49	Gamma Band	Oriental percussion ensemble. MW fades in metal drums and bells.
P50	Metal Reed	Harmonica or accordion with after-touch pitch bend.
P51	Modomatic	Choir with big MW filter sweep.
P52	DataStream	Best with long notes.
P53	Mystichoir	Play long chords for shifting notes.
P54	St.Michael	Choir with bells on release.
P55	Scatter	Voice on staccato notes, filtered synth on long tones.
P56	Triton	Best with long chords.
P57	Amazon	Wide touch range.
P58	SatinGlass	Metallic, spacious synth voice.
P59	BrassChime	Filtered brass with chimes.
P60	Piano Mist	Piano bell. MW fades to staccato filtered voice.
P61	Xanadu	Solo multi-tuned flute.
P62	WdBass Duo	Split wood bass and piano.
P63	Drum Set 1	Drum set inlcuding bass and sound effects.
P64	Drum Set 2	Drum set inlcuding bass and sound effects.

Selecting the VOICE PLAY Mode, a Voice Bank, 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.

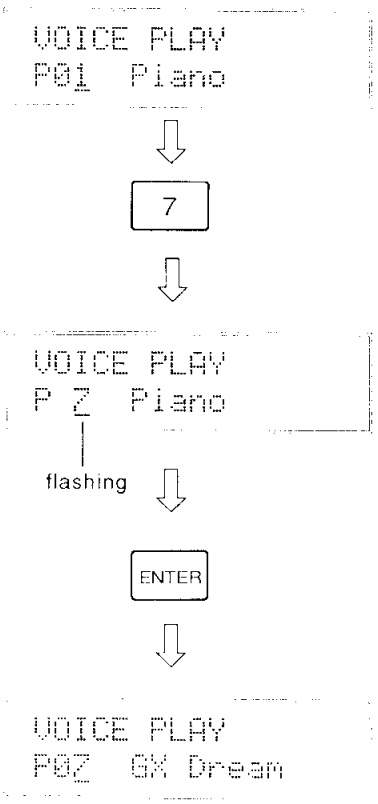
2. The [INTERNAL], [CARD] and [PRESET] keys are used to select the desired voice bank. If no memory card is inserted in the DATA slot, pressing the [CARD] key has no effect.



If a 2-bank memory card such as an MCD64 is inserted into the DATA slot and both banks of the card are properly formatted ("REFERENCE" section, page 138), pressing the [CARD] key alternately selects bank 1 (indicated by "C" on the display) or bank 2 ("Ↄ" on the display).

3. The [–1/NO] and [+1/YES] keys can be used to select the desired voice within the current bank. Holding the [–1/NO] and [+1/YES] causes continuous scrolling in the specified direction.

Any voice can also be directly selected by inputting its number via the numeric keys and then pressing [ENTER]. The entered number will flash on the display until the [ENTER] key is pressed, indicating that a new voice number has been selected but the voice has not yet been recalled.



Special technique: If you press the [SELECT/HOLD] key while in the voice play mode, "Hold" will appear in the upper right-hand corner of the display. This function "holds" the current tens digit of the voice number so that pressing a numeric key changes only the ones digit, directly calling the corresponding voice without the need to press the [ENTER] key. If, for example, the [SELECT/HOLD] key is pressed while a voice in the thirties is selected, then pressing numeric key [1] will immediately select voice number 31, the [5] key will immediately call voice number 35, etc. The hold mode can be released by pressing the [SELECT/HOLD] key a second time.

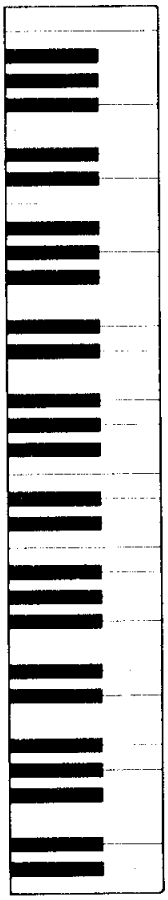
4. Play the selected voice via the SY55 keyboard.
If you don't get any sound at this point:

- Make sure your sound system is turned ON and the volume is turned up to a reasonable level.
- Make sure that the SY55 MASTER VOLUME control is turned up to a reasonable level.
- Check all connections.

Voice Numbers 63 and 64 are Drum-set Voices

Although most SY55 voices have a 1, 2 or 4-element configuration (we'll learn more about elements in the "EDITING VOICES" section, beginning on page 35), voices 63 and 64 in any voice bank are special drum-set voices that essentially have a 61-element configuration. Each element, in this case, corresponds to a different key on a keyboard. A range of high-quality drum and percussion waveforms can be assigned to the different elements/keys and handled as a single voice — i.e. each key plays a different instrument within that "drum set."

The drum-set voices are particularly useful with the SY55's MULTI PLAY mode and sequencer, described in the following two sections.



● Voice 63: Drum Set 1

Key	Wave Name	No.
A#5	Syn Bass	P28
G#5	Syn Bass	P28
F#5	Syn Bass	P28
D#5	Syn Bass	P28
C#5	Syn Bass	P28
A#4	Vocal Ga	P53
G#4	Bell Mix	P58
F#4	Bottle	P51
D#4	Shaker	P74
C#4	Bamboo	P54
A#3	Claps	P72
G#3	Popping	P26
F#3	Tube	P52
D#3	Ride	P71
C#3	Crash	P70
A#2	Crash	P70
G#2	Shaker	P74
F#2	Claps	P72
D#2	Rim	P65
C#2	SD 2	P63
A#1	SD 3	P64
G#1	BD 2	P60
F#1	Tom 2	P67
D#1	BD 3	P61
C#1	BD 2	P60

Key	Wave Name	No.
C6	Syn Bass	P28
B5	Syn Bass	P28
A5	Syn Bass	P28
G5	Syn Bass	P28
F5	Syn Bass	P28
E5	Syn Bass	P28
D5	Syn Bass	P28
C5	Syn Bass	P28
B4	Bulb	P57
A4	Vocal Ga	P53
G4	Bottle	P51
F4	Bottle	P51
E4	Styroll	P56
D4	Ride	P71
C4	Vibe Np	P50
B3	Vibe Np	P50
A3	Claps	P72
G3	Popping	P26
F3	Tube	P52
E3	Tube	P52
D3	Ride	P71
C3	Crash	P70
B2	HH open	P69
A2	HH closed	P68
G2	Cowbell	P73
F2	Tom 1	P66
E2	SD 1	P62
D2	Tom 1	P66
C2	Tom 1	P66
B1	Tom 1	P66
A1	BD 1	P59
G1	Tom 2	P67
F1	Tom 2	P67
E1	Tom 2	P67
D1	BD 3	P61
C1	BD 2	P60

● Voice 64: Drum Set 2

Key	Wave Name	No.
A#5	Syn Bass	P28
G#5	Syn Bass	P28
F#5	Syn Bass	P28
D#5	Syn Bass	P28
C#5	Syn Bass	P28
A#4	Vocal Ga	P53
G#4	Bell Mix	P58
F#4	Bottle	P51
D#4	Shaker	P74
C#4	Bamboo	P54
A#3	Claps	P72
G#3	Popping	P26
F#3	Tube	P52
D#3	Ride	P71
C#3	Crash	P70
A#2	Crash	P70
G#2	Shaker	P74
F#2	Claps	P72
D#2	Rim	P65
C#2	SD 1	P62
A#1	SD 3	P64
G#1	BD 1	P59
F#1	Tom 1	P66
D#1	BD 3	P61
C#1	BD 1	P59

Key	Wave Name	No.
C6	Syn Bass	P28
B5	Syn Bass	P28
A5	Syn Bass	P28
G5	Syn Bass	P28
F5	Syn Bass	P28
E5	Syn Bass	P28
D5	Syn Bass	P28
C5	Syn Bass	P28
B4	Bulb	P57
A4	Vocal Ga	P53
G4	Bottle	P51
F4	Bottle	P51
E4	Styroll	P56
D4	Ride	P71
C4	Vibe Np	P50
B3	Vibe Np	P50
A3	Claps	P72
G3	Popping	P26
F3	Tube	P52
E3	Tube	P52
D3	Ride	P71
C3	Crash	P70
B2	HH open	P69
A2	HH closed	P68
G2	Cowbell	P73
F2	Tom 2	P67
E2	SD 2	P63
D2	Tom 2	P67
C2	Tom 2	P67
B1	Tom 2	P67
A1	BD 2	P60
G1	Tom 1	P66
F1	Tom 1	P66
E1	Tom 1	P66
D1	BD 3	P61
C1	BD 1	P59

3. THE MULTI PLAY MODE

MULTI PLAY Setups

The SY55 MULTI PLAY (multi-timbre) mode allows different voices to be assigned to up to 16 different MIDI channels. This allows you to record and play multi-voice compositions using the SY55's internal 8-track sequencer, or an external sequencer if desired.

Here's an example — the preset "POP" multi-play setup (MULTI P01):

● **MULTI P01: POP instruments and channel assignments**

- Channel-1 voice: Pick Bass
- Channel-2 voice: Deep Organ
- Channel-3 voice: Trumpet
- Channel-4 voice: Saxophone
- Channel-5 voice: off
- Channel-6 voice: off
- Channel-7 voice: off
- Channel-8 voice: Drum Set 2
- Channel-9 voice: off

  ⋮ ⋮
- Channel-16 voice: off

In addition to 16 PRESET MULTI PLAY setups including the one described above, 16 INTERNAL memory locations are provided for complete "MULTI PLAY" setups including voice-to-channel assignments, individual voice volume, note shift, tuning, panning, and effects. This allows you to create up to 16 original "orchestras" with different combinations of voices that can be recalled whenever needed. MULTI PLAY setups can also be stored on external memory cards in the same way as ordinary voices.

MULTI PLAY Mode, Bank and Setup Selection

The MULTI PLAY mode, memory banks and individual MULTI PLAY setups are selected in the same way as the SY55 voices:

- [MULTI] to select the MULTI PLAY mode.
- [INTERNAL], [CARD] or [PRESET] to select the desired memory bank.
- [–1/NO] and [+1/YES] or numeric keys plus [ENTER] to select the desired MULTI PLAY setup.

MULTI PLAY Polyphony and Dynamic Note Allocation

Since the SY55 can produce a maximum of 16 notes at the same time (16-note polyphony), the number of simultaneous notes that each voice in a MULTI PLAY setup can produce depends on the number of voices being played at the time. If all 16 voices are played at once, each can only produce a single note. On the other hand, if only one voice is being played the SY55's "Dynamic Note Allocation" feature allows 16 notes to be played simultaneously by that one voice even if 16 voices are assigned.

The SY55 also has a RESERVED NOTE function that allows you to specify a minimum number of notes for each voice ("REFERENCE" section, page 110).

Checking and Modifying MULTI PLAY Voice Assignments

Here's how you can see what voices are assigned to the various channels in any MULTI PLAY setup, and change the voice assignments temporarily to try out alternative voices.

1. When you first select the MULTI PLAY mode by pressing the [MULTI] key, a display similar to the following will appear:

```
MULTI PLAY
P01  POP
```

   At this point you can use the [–1/NO] and [+1/YES] keys or numeric keys plus [ENTER] to select any of the 16 MULTI PLAY setups within the current bank.

2. If you press either the [PAGE ◄] or [PAGE ►] key after selecting the desired MULTI PLAY setup, a display similar to the following will appear:

```
<Pick Bass >
        CH 1=P32
```

   This display allows you to see and change the voices assigned to each channel. In the above display, "CH 1=P32" on the bottom line indicates that voice P32 is assigned to channel 1 (CH 1). Voice P32 is "Pick Bass," as indicated on the top display line. Note the underline cursor under the "1" of "CH 1."

3. While the underline cursor is positioned below the channel (CH) parameter, the [–1/NO] and [+1/YES] keys or numeric and [ENTER] keys can be used to select any of the 16 MIDI channels and see which voices are assigned to each.

4. When you're done checking the voice assignments you can return to the normal MULTI PLAY mode display by pressing either the [PAGE ◄] or [PAGE ►] key ... or you could continue and temporarily change one or more voices assignments as described in the following steps.

5. To change a voice assignment, first select the channel to which the new voice will be assigned, as described in the preceding steps.

6. Move the cursor to the voice parameter by pressing the [▷] key. The underline cursor should now be located under the voice number.

7. Use the [–1/NO] and [+1/YES] keys or numeric and [ENTER] keys to select the new voice for that channel, or turn the channel "off" (decrementing below voice number 01 selects "off"). Different memory banks can be selected by using the [MEMORY] key.

8. To assign a new voice to a different channel, simply move the cursor back to the channel parameter by pressing the [◁] key and repeat the above procedure.

Note: This function is primarily intended for checking voice assignments and making temporary changes to try out different voices in a MULTI PLAY setup. Voice assignment changes are only temporary and the original voice assignments will be restored as soon as a different MULTI PLAY setup or mode is selected. Permanent changes can be made in the MULTI PLAY EDIT mode, described next.

Creating an Original MULTI PLAY Setup

In this section we'll go through the steps to create a simple "Jazz Quartet" MULTI PLAY setup consisting of the following voices:

Channel 1 .....P01 Piano
Channel 2 .....P62 WdBass Duo
Channel 3 .....P40 Vibraphone
Channel 4 .....P63 Drum Set 1
Channels 5 ... 16 ...off

Note: P62 WdBass Duo is actually a split voice with wood bass ranging from C–2 to E3 and piano on all higher keys up to G8.

1. If it is not already selected, press [MULTI] to select the MULTI PLAY mode.

2. Use the [INTERNAL], [–1/NO] and [+1/YES] keys to select MULTI PLAY setup I01.

3. Press [EDIT/COMPARE] to enter the MULTI PLAY EDIT mode.

4. If a display similar to the following is not showing, press the [JOB] key, then the numeric [1] key, and finally the [ENTER] key to select it (while the [PAGE ◄] and [PAGE ►] keys can be used to step forward and backward through the jobs in any edit mode, using job numbers is often the fastest way to access a specific editing job — "REFERENCE" section, page 52).

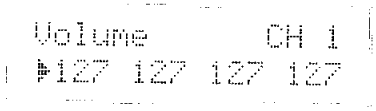
This is the display for the MULTI PLAY EDIT mode voice assignment function ("REFERENCE" section, page 108).

5. The [<] and [>] cursor keys are used to move the cursor (♯) to the desired channel (a channel number between CH1 and CH16 will appear in the upper right-hand corner of the display), and the [DATA ENTRY] control, [+1/YES] and [–1/NO], keys or numeric and [ENTER] keys are used to assign the desired voice to the selected channel.

   - With the cursor at the channel-1 position, make sure the P01 (Piano) voice is selected.
   - Move the cursor to the channel-2 position by pressing [>], then select voice P62 (WdBass Duo).
   - Move the cursor to the channel-3 position by pressing [>], then select voice P40 (Vibraphone).
   - Move the cursor to the channel-4 position by pressing [>], then select voice P63 (Drum Set 1).

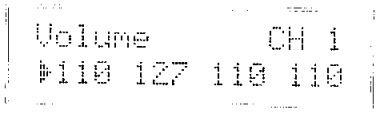
- Move the cursor to all the remaining channel positions (5 ... 16) and turn each "off" by holding the [–1/NO] key until the "off" display appears. Note that the cursor can be moved past the end of the display screen to access the remaining channels in groups of four.

6. Press the [PAGE ►] key to move to the next MULTI PLAY EDIT mode job: Volume ("REFERENCE" section, page 108).



7. The volume job operates in basically the same way as the voice assignment job described above. The [<] and [>] cursor keys are used to select the channel/voice for which the volume is to be adjusted, then the [DATA ENTRY] control, [+1/YES] and [–1/NO] keys, or numeric and [ENTER] keys are used to set the desired volume. A setting of "0" produces no sound while a setting of "127" produces maximum volume.

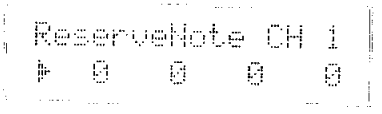
   With the Jazz Quartet setup, the relatively gentle wood bass sound tends to become "buried" under the other instruments, so leave its volume setting at the maximum of 127, and lower the other three voices to about 110.



Volume

Piano 110
WdBass Duo 127
Vibraphone 110
Drum Set 1 110

8. Press the [JOB] key, the numeric [5] key, and then the [ENTER] key to move to the Reserved Note job ("REFERENCE" section, page 110). We'll skip the Note Shift and Tune ("REFERENCE" section, page 109) jobs for this setup, since we don't need to tune or transpose the pitch of any of the voices in the Jazz Quartet setup.



9. The main use for Reserved Note job is to ensure that a minimum number of notes are available to specific instruments even under circumstances in which less would normally be available. In this case we'll set channel 1 (Piano) to 8 since jazz piano tends to involve a lot of "thick" chord work, and channel 3 (Vibraphone) to 4, which is enough for two-handed phrases. This simply means that there will always be at least 8 notes available for piano and 2 notes available for vibraphone (Vibraphone uses 2-elements: 2 elements x 2 notes = 4), no matter how many notes are played at the same time by bass and drums. If the total number of notes played exceeds 16 at any instant, the bass or drum voice notes will be truncated rather than the piano or vibes notes.

Reserved Note

Piano 8
WdBass Duo 0
Vibraphone 4
Drum Set 1 0

The [<] and [>] cursor keys are used to select the voice/channel, then the [DATA ENTRY] control, [+1/YES] and [–1/NO] keys, or numeric and [ENTER] keys are used to set the number of reserved notes.

10. Press the [PAGE ►] key to move to the next MULTI PLAY EDIT mode job: Pan ("REFERENCE" section, page 110).

11. This job allows each individual voice in the setup to be panned to a different position in the stereo sound field (you'll only hear this if you're using a stereo sound system fed by the SY55 OUTPUT R and L/MONO jacks).

As always, the [<] and [>] cursor keys are used to select the voice/channel for which the pan position is to be set, then the [DATA ENTRY] control, [+1/YES] and [–1/NO] keys, or numeric and [ENTER] keys are used to set the pan position.

The upper line of the display also shows a graphic representation of the stereo sound field with "L" representing "left" and "R" representing "right." As you change the pan value the vertical bar will appear at the corresponding position on the graphic display.

Set the pan positions of the Jazz Quartet voices as follows:

Pan

Piano .....–17 (half way to the left)
WdBass Duo .....–9 (slightly to the left)
Vibraphone .....+17 (half way to the right)
Drum Set 1 .....+5 (slightly to the right)

12. Press the [PAGE ►] key once to move on to the Effect Level job ("REFERENCE" section, page 111).

13. The Effect Level job individually sets the effect level for each voice in the setup. You know how to move the cursor around and change settings by now.

    Set the Effect Level for all four voices to 100 (this is equivalent to the individual voice effect level settings).

    Effect Level

    Piano 100
    WdBass Duo 100
    Vibraphone 100
    Drum Set 1 100

    A hall reverb effect is already selected for the I01 MULTI PLAY setup, so we won't bother with the many possible effect settings for now ("REFERENCE" section, page 86).

14. Press the [PAGE ►] key twice to move on to the MULTI Name job ("REFERENCE" section, page 113).

15. Here's where we actually name our MULTI PLAY setup: "Jazz Quart". The MULTI Name job allows a name of up to 10 characters to be assigned to the current setup. Use the [◁] and [▷] cursor keys to place the underline cursor under the character to be changed, then use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to select the desired character. Continue until the entire voice name has been programmed.

16. Press [MULTI] to exit from the edit mode and return to the MULTI PLAY mode. The reversed letter "E" that appears to the right of the voice number indicates that the MULTI PLAY setup has been edited.

    Caution!!: If you select a different MULTI PLAY setup or mode at this point, the edited MULTI PLAY setup will be erased. To keep an edited setup, it must be stored to an INTERNAL or CARD memory location, as described in the following section. For a special method of recalling a multi-play setup lost in this way, see "MULTI RECALL" on page 113.

Storing an Edited MULTI PLAY Setup

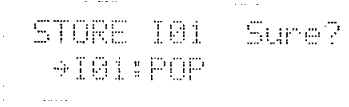
Now that you've created your first MULTI PLAY setup — "Jazz Quart" — you'll want to store it to one of the SY55's 16 internal MULTI PLAY memory locations or a memory card location.

1. After exiting the edit mode by pressing the [MULTI] key, press the [STORE/COPY] key. The following display will appear:

The MULTI PLAY memory number on the top line indicates the source setup — i.e. "Jazz Quart," the setup we just created. The MULTI PLAY number after the arrow on the bottom line is the target setup — i.e. the memory location to which we will store the edited setup.

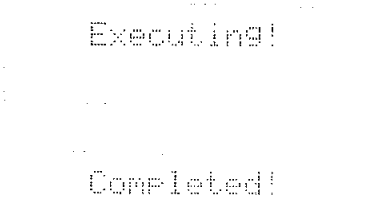
2. The target memory location can be changed by using the [DATA ENTRY] control, [+1/YES] and [–1/NO] keys, or numeric and [ENTER] keys. The [INTERNAL] and [CARD] keys can be used to change banks, if necessary (obviously you can't store to the read-only PRESET bank, or to a card if no card is loaded).

3. When you're satisfied with the target memory location selection, press [ENTER].



"Sure?" appears on the top line of the display, asking you to confirm you intention to store to the selected target location. This confirmation step is important because once you store, all previous data in the target location is erased and completely replaced by the new data.

4. Press [+1/YES] to confirm and actually execute the store operation, or [–1/NO] to cancel. "Executing!" will appear on the display during store, and "Completed!" will appear briefly when the store operation is finished.



Your "Jazz Quart" MULTI PLAY setup has now been stored and can be recalled whenever needed!

Note: See the ERROR MESSAGES section on page 144 for information on memory-card related error messages.

Conclusion

If you've gone all the way through this section and followed all the instructions, you've actually done much more than program your first MULTI PLAY setup. You've learnt about many of the most important SY55 programming procedures and, as a result, should find the next tutorial easy to handle.

There are a few functions and features of the MULTI PLAY mode that we haven't looked at in this tutorial. Refer to the "REFERENCE" section for details.

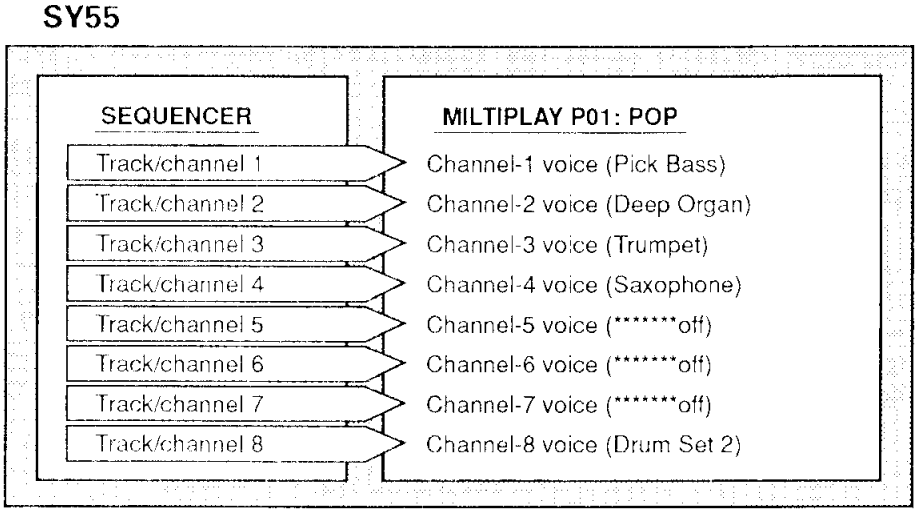
4. RECORDING & PLAYBACK WITH THE SEQUENCER

In the preceding section we learned about the SY55 multi-play mode, and how to create original multi-play setups. In this section we'll see how the SY55 sequencer can be used to record the various parts of a musical composition, and "drive" the corresponding instruments of a multi-play setup. The SY55 sequencer can hold up to 8 separate "songs," each with its own song name ("REFERENCE" section, page 127), that can be selected and recorded or played as required. Completed songs can also be stored to external memory cards for long-term storage ("REFERENCE" section, pages 140 and 141).

The Sequencer/Multi-Play Interface

The SY55 sequencer has 8 separate tracks, each of which can control a separate multi-play instrument. Which track controls which instrument is determined by both the multi-play setup MIDI channel assignments ("REFERENCE" section, page 108) and the sequencer track channel assignments ("REFERENCE" section, page 119). Normally, sequencer tracks 1 through 8 are assigned to the correspondingly numbered MIDI transmit channels, so tracks 1 through 8 control the multi-play instruments assigned to MIDI channels 1 through 8, respectively.

In the example below, preset multi-play setup P01 ("POP") is selected. In the "POP" setup, bass, organ, trumpet and saxophone are assigned to channels 1 through 4, channels 5 through 7 are off, drums are assigned to channel 8, and channels 9 through 16 are off. We therefore have 5 active instruments which will be controlled by the corresponding sequencer tracks.



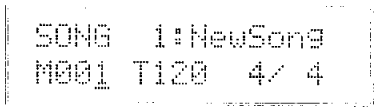
There are basically two ways to record using the sequencer realtime or step. Both of these methods are described below.

Realtime Recording: Replace & Overdub

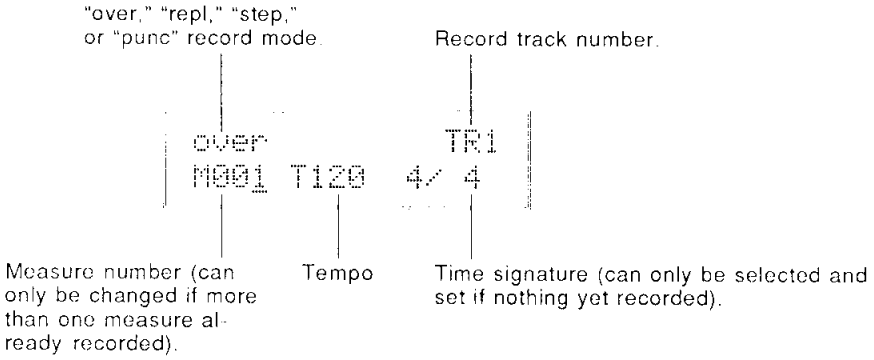
Realtime recording allows you to directly record anything you play on the keyboard, capturing the spontaneous timing, keyboard dynamics and controller operations of the performance. Using the realtime recording mode is, in fact, very much like using a conventional tape recorder. Realtime recording is best for parts you can play easily on the keyboard, and for passages in which you want to retain the human "feel" of naturally varying timing and other musical factors.

1. Before recording, press the [MULTI] key and select the multi-play setup you intend to use, then press the [SEQ] key to enter the sequencer mode.

2. At this point you're in the sequencer play mode. The underline cursor will be under the "SONG" (song number) parameter, so you can use the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to select the song number you want to record to (1 through 8).



3. Press the [RECORD] key. The [RECORD] key indicator will light and a display similar to the following will appear.



4. Use the [◁] and [▷] keys to move the underline cursor to the parameter in the upper right-hand corner of the display, and use the [DATA ENTRY] control or [–1/NO] and [+1/YES] keys to select the "repl" (replace) or "over" (overdub) record mode.

The Replace Record Mode

Anything recorded in this mode replaces previously recorded material. That is, previous data on the current track is erased and replaced by the new material.

The Overdub Record Mode

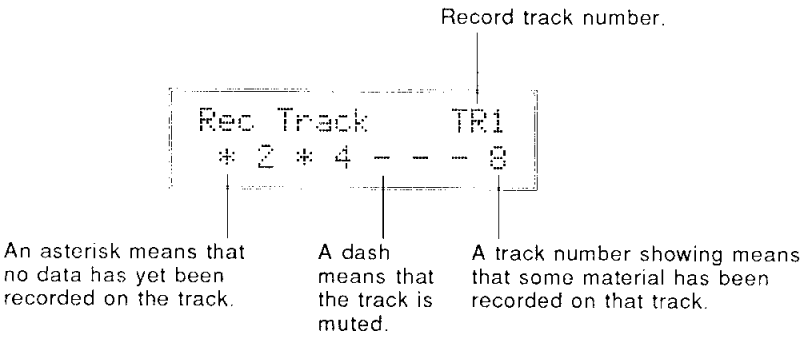
Material recorded in the overdub mode is recorded "over" any previous material, so you end up with a combination of the previous and newly-recorded data.

5. If necessary, the tempo, measure, and time signature parameters can also be set at this time. The time signature can only be set if nothing has been recorded in the current song. You can start recording from any measure number within the range of already-recorded measures by setting the measure parameter accordingly. The tempo can be set before recording any track. This is useful because you might want to record complex passages at a slower tempo to minimize mistakes.

   Time Signatures

   When setting the time signature, the cursor can be moved to the time signature numerator or denominator so that these two values can be set separately. Available time signature ranges are: 1/4 ... 4/4, 1/8 ... 8/8, and 1/16 ... 16/16.

6. Select the track you want to record by pressing the appropriate track key (TR1 ... TR8, labelled in green below the numeric keys) while holding the [SELECT] key. A display similar to the following will appear while the [SELECT] key is held.

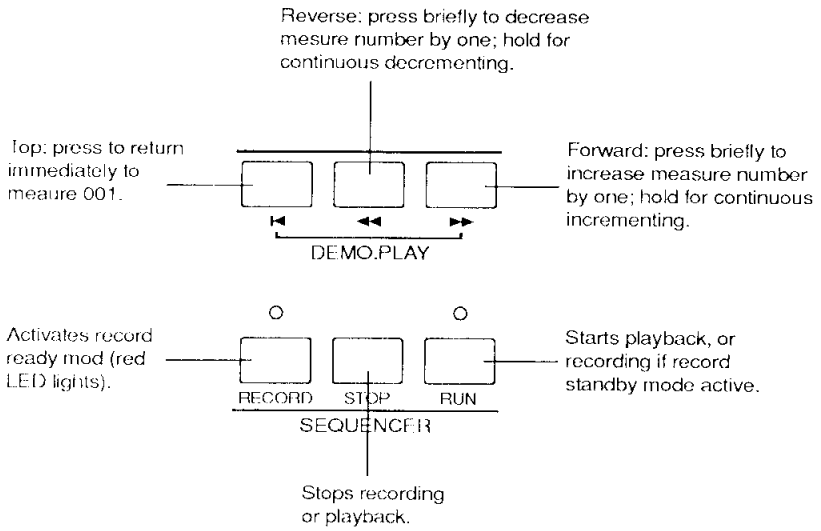


   When the desired record track is selected, the corresponding instrument in the current multi-play setup will sound when the keyboard is played.

7. Press the [RUN] key and start recording after a two-measure count-in. The count-in is indicated visually on the LCD by "minus" measure numbers — e.g. recording will actually begin after a two-measure count-in from –8 to 0 if 4/4 time is selected, –16 to 0 if 8/8 time is selected, etc. The "click" metronome will also sound as long as the "CLICK SELECT" function is set appropriately ("REFERENCE" section, page 118) and the rear-panel [CLICK VOLUME] control is set to an appropriate level. After the count-in, the measure numbers will increase as recording progresses. The [RUN] key indicator also flashes to indicate the tempo — red on the first beat of every measure and green on all other beats.

8. When you have finished playing the part for the current track, press the [STOP] key to stop recording. Both the [RUN] and [RECORD] key indicators will go out, and "Executing!" will appear on the display briefly while recorded data is being processed. After this, the SY55 will return to the sequencer play mode.

9. You can now listen to the part you've just recorded by pressing the sequencer [⏮] key (see illustration below) to return to the first measure, and then the [RUN] key. You can also use the forward and reverse keys to move to any measure and listen to playback from that point.

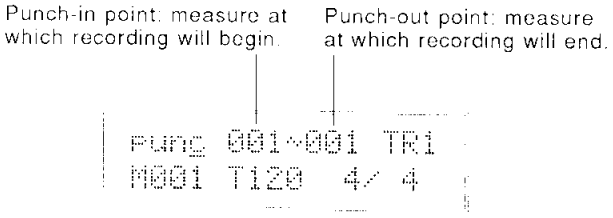


Playback will stop automatically when the end of the recorded sequence is reached, or it can be stopped at any time by pressing the [STOP] key.

10. When you're satisfied that the first track is OK, go back to step 5 and select a new record track, then record. Continue this process until your composition is complete. For difficult tracks you might want to use the step record mode, described on the next page.

Punch-in Recording

Punch-in recording makes it possible to re-record (replace) a section of a previously-recorded track without affecting the data before and after the punch-in section. All operations are the same as for replace recording, except that you must specify the measure numbers for the beginning and end of the punch-in segment. If you select "punc" instead of "over" or "repl," (see step 4, above) the display will appear as follows:



Move the cursor to the punch-in and punch-out point parameters and set as required prior to recording. Other parameters within this display can be set in the same way as for replace or overdub recording.

Once recording is started the sequence will play back until the punch-in point is reached, then the replace record mode will be activated until the punch-out point is reached, allowing you to record the new material. If recorded material exists following the punch-out point, playback will continue until the end of the sequence.

Step Recording

Step recording allows you to input parts note by note, rest by rest, without having to actually play the part on the keyboard. This is ideal for entering difficult parts from written music, or for extremely complex or fast passages that would be impossible to play in real time.

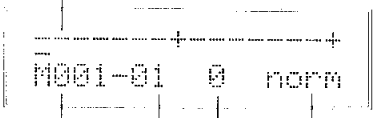
The step recording mode can also be used to edit tracks previously recorded using one of the realtime record modes, allowing you to add or erase notes where necessary.

1. The sequencer and record standby modes are entered in the same was as described in the "REALTIME RECORDING" section, above.

2. Instead of choosing the "repl" or "over" record mode, select "step." You can also select a time signature at this point if nothing has been recorded yet.

3. Press the [RUN] key, to call the step record edit display.

Step write input display line. Each dash represents a 32nd beat. Plus signs mark the beginning of each beat specified by the selected time signature. The example below corresponds to a 1/4 ... 4/4 time signature. If an 8-beat time signature (1/8 ... 8/8) were selected, plus signs would appear every 4 32nd beats. The cursor is placed under the appropriate beat of the display line by using the [◁] and [▷] cursor keys or the sequencer [◀◀] and [▶▶] keys to enter notes or rests. The position of the cursor is also reflected by the measure and beat number displays below.



Measure number.

Beat number. A measure and beat number display of "M004-03," for example, would mean "fourth measure, third beat." The measure and beat number correspond to the position of the cursor under the step recoprd input display line.

Staccato, normal or slur. This refers to the note "gate time" and is set using the step write Gate Time function described later.

Note length to be entered. A "0" indicates that no note will be entered. Standard note lengths from 32nd to whole notes, including dotted versions, are displayed in this position in standard written form. Others are displayed as numbers.

4. Select the note length for the first note by pressing the corresponding numeric key (standard notes are displayed in white above the keys), or by incrementing/decrementing using the [–1/NO] and [+1/YES] keys. The number of 32nd-note segments corresponding to the selected note length will be emphasized on the display. If you select 8th notes in 4/4 time, for example, the display will look something like this:

Four 32nd-notes equal one eighth note.

Dotted Notes

Pressing the dot [•] key (numeric key [8]) adds half the value of the currently displayed note length. If this results in a standard note length, it is displayed as a dotted note. Otherwise it is displayed as a numeric value.

Triplets

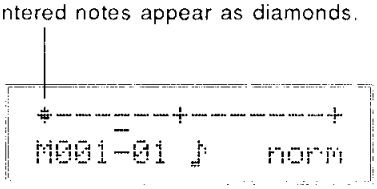
Triplet-length notes are entered by first selecting the basic note length — e.g. 8th notes if you want 8th-note triplets, 16th notes if you want 16-note triplets, etc. — and then the [⌐3¬] key (numeric key [9]). When a note is being displayed "♪³" appears to the right of the note, while numeric values are divided by two-thirds (since triplets squeeze three notes in the space normally occupied by two, triplet notes are two-thirds the length of their standard counterparts). You should normally enter triplet notes in groups of 3, 6, 9, 12 or other multiples of 3, in order to end up with standard note lengths.

Ties

Press the [TIE] key (numeric key [–]) immediately after entering a note to tie that note to the next note entered. The tie function is cancelled if you move the cursor between pressing the [TIE] key and entering the second note.

5. When you've selected the required note length, play the note to be entered on the keyboard. The entered note will appear as a diamond (◆) on the step record input display line. The cursor will move to the beginning of the next note.

Entered notes appear as diamonds.



Press the [REST] key (numeric key [0]) instead of playing a note if you want to enter a rest of the currently specified length.

6. Repeat steps 4 and 5 until the required material is entered. You can move the cursor back and forth using the [◁] and [▷] cursor keys or sequencer [◀◀] and [▶▶] keys, adding notes wherever you like — even on top of other notes to create chords.

Erasing Notes

To erase a note, move the cursor to that note and press the [ERASE] key (numeric key [7]). The diamond note marker will disappear. If the diamond marks a chord, the entire chord will be erased.

Staccato and Slurred Notes

Staccato and slurred notes can be entered by using the Gate Time function — press the [PAGE ►] key while the step record edit display is showing.

Use the [DATA ENTRY] control or [–1/NO] and [+1/YES] keys to select "Staccato:50%," "Normal:80%," or "Slur:99%." The percentage values are the gate time of the notes. Gate time is the time between the beginning of one note and the beginning of the next. Once the desired gate time has been set, press the [PAGE ◄] key to return to the step record edit display and continue recording.

Switching Voices Mid-track

You can switch to a different voice anywhere in a track by entering a program change command at the required point. After moving the cursor to the point at which you want to change voices in the step record edit display, press the [PAGE ►] key twice or the [PAGE ◄] key once to select the program change display.

Select the desired bank and voice in the normal way, then press the [ENTER] key. The display will return to the step record edit display, and a "p" will occur at the point at which the program change command was entered. Program change commands can be erased in the same was as notes by using the [ERASE] key.

7. Press the [STOP] key to exit the step record mode and return to the sequencer play mode.

Playback

The sequencer play mode is selected anytime you press the [SEQ] key from another mode. The sequencer play display, shown below, allows selection of the song number to play, the measure from which to begin playback, and tempo.

```
SONG  1:NewSong
M001 T120  4/ 4
```

Once the sequencer play mode has been selected, you can use the sequencer [◄◄] and [►►] keys to move to any measure from which you want to begin playback, or the [⏮] key to move directly to the first measure. The [RUN] key starts playback from the selected measure, and the [STOP] key stops playback at any time.

Track Muting

If you press the [SELECT] key at any time in the sequencer play mode — even while a sequence is playing — the track mute display appears.

```
Track Mute
 * 2 * 4 - - - 8
```

An asterisk means that no data has yet been recorded on the track.

A dash means that the track is muted.

A track number showing means that some material has been recorded on that track.

Then, while holding the [SELECT] key, the TR1 through TR8 keys (numeric keys [7], [4], [1], [0], [8], [5], [2], and [–], respectively) can be used to alternately engage or disengage muting for the corresponding track. A dash appears in place of the track number when a track is muted.

Conclusion

Now that you now how to record and play back sequences with the SY55, you'll want to take a look at the "SEQUENCER MODE" information beginning on page 116 of the reference section. There are many important editing and other jobs that have not been described here, but which can make the process of "sequencing" smoother and much more versatile.

5. EDITING VOICES

SY55 Voicing Basics

AWM2 Waveforms

"AWM2" is an acronym for YAMAHA's second-generation 16-bit Advanced Wave Memory. This is a digital waveform storage and reproduction system that rivals the quality of the finest compact disc players, providing unprecedented clarity and realism in the reproduction of acoustic instruments and other natural timbres. Technically speaking, AWM2 deals with 16-bit wave data sampled at 32 or 48 kilohertz, 24-bit internal signal processing, and high-resolution 22-bit digital-to-analog converters.

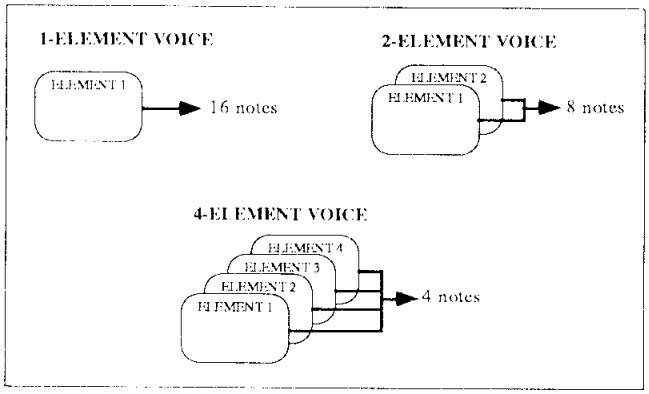
The SY55 contains 2 megabytes of of sampled waveform ROM, so you have a choice of 74 built-in waveforms from which to construct voices.

● PRESET WAVE LIST

No.	Name	No.	Name	No.	Name	No.	Name
1	Piano	21	GtrSteel	41	Digital2	61	BD 3
2	E.Piano1	22	Gtr Gut	42	Digital3	62	SD 1
3	E.Piano2	23	12string	43	Pulse 10	63	SD 2
4	E.Piano3	24	E.Guitar	44	Pulse 25	64	SD 3
5	E.Piano4	25	E.Bass	45	Pulse 50	65	Rim
6	E.Piano5	26	Popping	46	Tri	66	Tom 1
7	E.Piano6	27	WoodBass	47	Voice	67	Tom 2
8	E.Piano7	28	Syn Bass	48	Piano Np	68	HHclosed
9	Harpsi	29	Violin	49	EPianoNp	69	HH open
10	Organ 1	30	Strings	50	Vibe Np	70	Crash
11	Organ 2	31	Chorus	51	Bottle	71	Ride
12	Pipe	32	Itopia	52	Tuba	72	Claps
13	Trumpet	33	Vibe	53	Vocal Ga	73	Cowbell
14	Mute Tp	34	Marimba	54	Bamboo	74	Shaker
15	Trombone	35	Glocken	55	Noise		
16	Flugel	36	Shamisen	56	Styroll		
17	Sax	37	Harp	57	Bulb		
18	Flute	38	Mtl Reed	58	Bell Mix		
19	Brass	39	Saw	59	BD 1		
20	SynBrass	40	Digital1	60	BD 2		

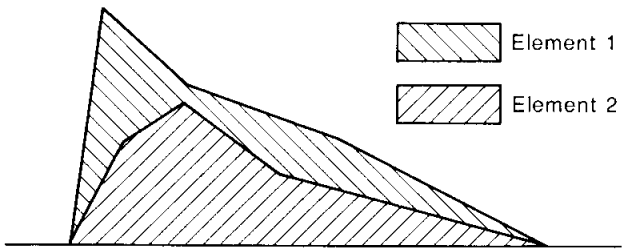
Elements and Voice Architecture

Each SY55 voice is composed of one, two or four "elements." The only limitation is that the maximum polyphony of the SY55 is 16 (i.e. the maximum number of notes that can be played simultaneously is 16). This means that a 1-element voice can produce the full 16 notes, while a "layered" 2-element voice can produce 8, and a layered 4-element voice can produce 4.



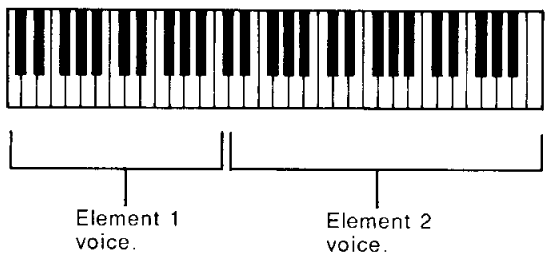
Each element can be assigned an AWM2 waveform from the 74 provided in internal ROM, or others available on plug-in waveform cards. You can have a single element voice that uses only a single waveform, or multi-element voices that combine two or four different waveforms in a number of ways. Each element has its own programmable 5-segment amplitude envelope generator so you can "layer" waveforms enveloped in different ways to create any number of unique sonic hybrids. See page 64 of the "REFERENCE" section for a full description of the amplitude envelope generator parameters.

Example of 2-element voice with "layered" envelopes.

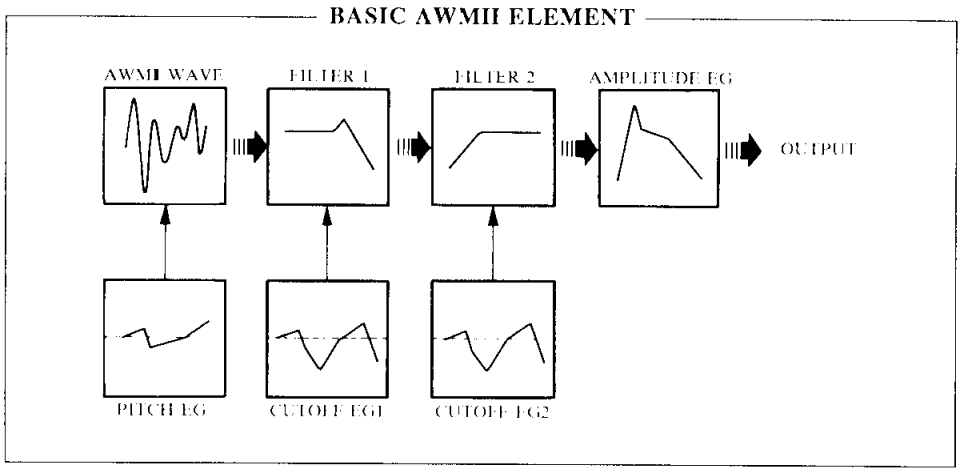


As an alternative to layering elements, each element can be assigned to a different section of the keyboard for exotic split keyboard setups using the low and high-note limit functions described on page 60 of the "REFERENCE" section.

Split keyboard created with 2-element voice.



Each element also has a pitch envelope generator and two filter cutoff envelope generators that control the SY55's innovative digital filter system. The block diagram below shows how the various operational blocks within each element are interconnected.

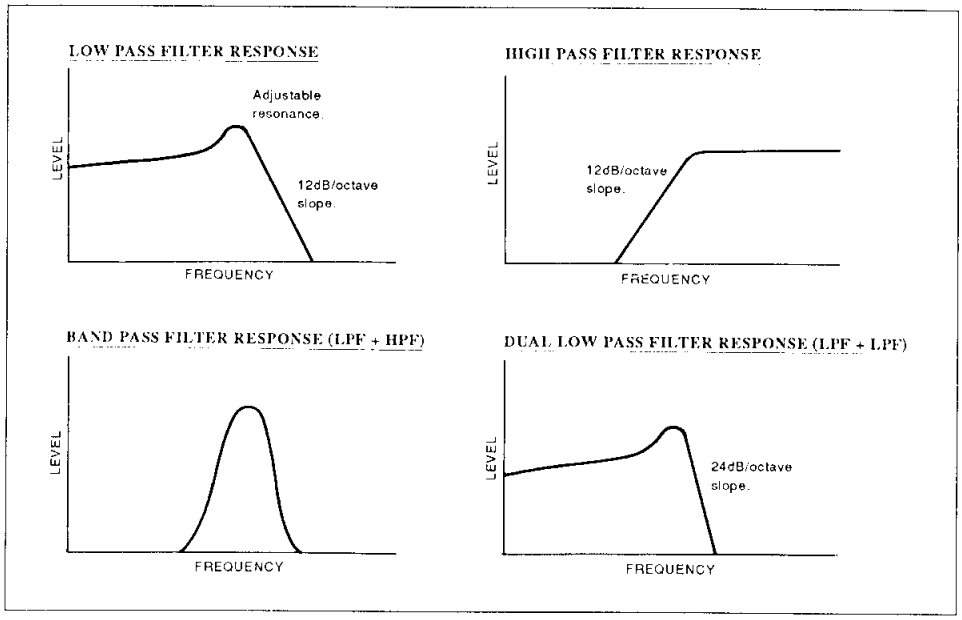


Digital Filters

Each element has two digital filters. Filter 1 (FL1) is switchable for either low-pass or high-pass response, while Filter 2 (FL2) is a low-pass type. Each filter has its own 6-segment envelope generator so that a virtually unlimited range of dynamic filtering patterns can be produced. See page 63 of the "REFERENCE" section for details on the filter cutoff envelope generators. Filter cutoff can also be controlled by the element's LFO (low-frequency oscillator).

Low-pass and high-pass filters can be combined to create a bandpass response, or both filters can be set for low-pass operation — each with a rolloff slope of 12-dB/octave — to produce a steep 24-dB/octave low-pass curve. The filters also have a resonance parameter in the low-pass mode that allows you to boost their cutoff-frequency peak — all the way into oscillation if you like. The following graphs show the types of filter response that can be achieved.

Filter Response Examples



Other Programmable Parameters & Effects

For each element in any voice you can also control volume, note shift, detuning, high and low note limits, high and low velocity limits for velocity-switched keyboard dynamics, pan position, LFO modulation, controller assignments and more. Of course, the standard pitch and modulation wheels perform their familiar functions, but you can also assign any MIDI controller to amplitude modulation, pitch modulation, filter cutoff modulation, direct filter cutoff control, envelope generator bias and volume ... not to mention after-touch pitch bias ("REFERENCE" section, pages 81 through 84).

You also have direct access to 34 digital effect programs including reverb, delay, early reflection, tone control and distortion — each with several programmable parameters. See page 86 of the "REFERENCE" section for details on the effects and their various parameters.

SY55 Effects

1: Rev.Hall	(Reverb Hall)
2: Rev.Room	(Reverb Room)
3: RevPlate	(Reverb Plate)
4: RevChrch	(Reverb Church)
5: Rev.Club	(Reverb Club)
6: RevStage	(Reverb Stage)
7: BathRoom	(Reverb Bath Room)
8: RevMetal	(Reverb Metal)
9: Delay	(Single Delay)
10: DelayL/R	(Stereo Delay)
11: St.Echo	(Stereo Echo)
12: Doubler1	(Single Doubler)
13: Doubler2	(Stereo Doubler)
14: PingPong	(Ping Pong Delay)
15: Pan Ref.	(Pan Reflections)
16: EarlyRef	(Early Reflections)
17: Gate Rev	(Gate Reverb)
18: Rvs Gate	(Reverse Gate)
19: FB E/R	(Feedback Early Reflections)
20: FB Gate	(Feedback Gate)
21: FB Rvs	(Feedback Reverse)
22: Dly1&Rev	(Delay 1 & Reverb)
23: Dly2&Rev	(Delay 2 & Reverb)
24: Tunnel	(Tunnel Reverb)
25: Tone 1	(Tone Control 1)
26: Dly1&T1	(Delay 1 & Tone Control 1)
27: Dly2&T1	(Delay 2 & Tone Control 1)
28: Tone 2	(Tone Control 2)
29: Dly1&T2	(Delay 1 & Tone Control 2)
30: Dly2&T2	(Delay 2 & Tone Control 2)
31: Dist&Rev	(Distortion & Reverb)
32: Dst&Dly1	(Distortion & Delay 1)
33: Dst&Dly2	(Distortion & Delay 2)
34: Dist.	(Distortion)

SY55 Voice Parameter Chart

The voice parameter chart on the following page lists all of the programmable voice parameters — titled as they appear on the SY55 editing screen. You might want to make copies of this chart in order to jot down parameters as you program your own voices.

SY55 Voice Parameter Chart.

Voice Name:

	EL1	EL2	EL3	EL4
VOICE Mode				
Wave Select				
Volume				
Note Shift				
Detune				
Note Limit/L				
Note Limit/H				
Vel. Limit/L				
Vel. Limit/H				
Pan				
EF Balance				
OSC Frq.Mode				
OSC Frq.Note				
OSC Frq.Tune				
AEG Mode				
AEG R1/HT				
AEG R2				
AEG L2				
AEG R3				
AEG L3				
AEG R4				
AEG RR				
AEG R.Scale				
AEG LS BP1				
AEG LS BP2				
AEG LS BP3				
AEG LS BP4				
AEG LS OFS1				
AEG LS OFS2				
AEG LS OFS3				
AEG LS OFS4				
Sens. Vel.				
Sens. V.Rate				
Sens. AMS				
Sens. PMS				
LFO Wave				
LFO Speed				
LFO Delay				
LFO Phase				
LFO AMOD				
LFO PMOD				
LFO CutofMOD				
PEG L0				
PEG R1				
PEG L1				
PEG R2				
PEG L2				
PEG R3				
PEG L3				
PEG RR				
PEG RL				
PEG Range				
PEG R.Scale				
PEG Vel.SW				
FL1\Type				
FL1\Cutoff				
FL1\Mode				
FL1\CEG L0				
FL1\CEG R1				
FL1\CEG L1				
FL1\CEG R2				
FL1\CEG L2				
FL1\CEG R3				

	EL1	EL2	EL3	EL4
FL1\CEG L3				
FL1\CEG R4				
FL1\CEG L4				
FL1\CEG RR1				
FL1\CEG RL1				
FL1\CEG RR2				
FL1\CEG RL2				
FL1\R.Scale				
FL1\LS BP1				
FL1\LS BP2				
FL1\LS BP3				
FL1\LS BP4				
FL1\LS OFS1				
FL1\LS OFS2				
FL1\LS OFS3				
FL1\LS OFS4				
FL2\Type				
FL2\Cutoff				
FL2\Mode				
FL2\CEG L0				
FL2\CEG R1				
FL2\CEG L1				
FL2\CEG R2				
FL2\CEG L2				
FL2\CEG R3				
FL2\CEG L3				
FL2\CEG R4				
FL2\CEG L4				
FL2\CEG RR1				
FL2\CEG RL1				
FL2\CEG RR2				
FL2\CEG RL2				
FL2\R.Scale				
FL2\LS BP1				
FL2\LS BP2				
FL2\LS BP3				
FL2\LS BP4				
FL2\LS OFS1				
FL2\LS OFS2				
FL2\LS OFS3				
FL2\LS OFS4				
FL\Resonance				
FL\Vel.Sens				
FL\Mod.Sens				
CNTL\Pitch Bend				
CNTL\AT P.Bias				
CNTL\RandomPitch				
CNTL\AMOD CTL#				
CNTL\AMOD RNG				
CNTL\PMOD CTL#				
CNTL\PMOD RNG				
CNTL\CoffMOD CTL#				
CNTL\CoffMOD RNG				
CNTL\Cutoff CTL#				
CNTL\Cutoff RNG				
CNTL\EG Bias CTL#				
CNTL\EG Bias RNG				
CNTL\Volume CTL#				
CNTL\Volume MIN				
EF\Type				
EF\Output Level				
EF\ ** Others **				

SY55 Voice Parameter Chart.

Voice Name: VeloChorus

	EL1	EL2	EL3	EL4
VOICE Mode	2 Element			
Wave Select	P31	P56		
Volume	127	100		
Note Shift	0	0		
Detune	0	0		
Note Limit/L	C-2	C-2		
Note Limit/H	G8	G8		
Vel. Limit/L	1	55		
Vel. Limit/H	127	127		
Pan	0	0		
EF Balance	50	60		
OSC Frq.Mode	norm	norm		
OSC Frq.Note	—	—		
OSC Frq.Tune	0	0		
AEG Mode	nrm	nrm		
AEG R1/HT	30	63		
AEG R2	37	12		
AEG L2	59	50		
AEG R3	28	30		
AEG L3	54	47		
AEG R4	0	0		
AEG RR	30	30		
AEG R.Scale	0	0		
AEG LS BP1	C1	C1		
AEG LS BP2	G2	G2		
AEG LS BP3	E4	E4		
AEG LS BP4	C6	C6		
AEG LS OFS1	0	0		
AEG LS OFS2	0	0		
AEG LS OFS3	0	0		
AEG LS OFS4	0	0		
Sens. Vel.	0	0		
Sens. V.Rate	off	off		
Sens. AMS	0	0		
Sens. PMS	2	0		
LFO Wave	tri	tri		
LFO Speed	57	65		
LFO Delay	70	0		
LFO Phase	0	0		
LFO AMOD	0	0		
LFO PMOD	0	0		
LFO CutofMOD	0	0		
PEG L0	–15	–22		
PEG R1	60	40		
PEG L1	0	0		
PEG R2	63	63		
PEG L2	0	0		
PEG R3	63	63		
PEG L3	0	0		
PEG RR	63	63		
PEG RL	0	0		
PEG Range	2 oct	2 oct		
PEG R.Scale	0	0		
PEG Vel.SW	off	off		
FL1\Type	LPF	LPF		
FL1\Cutoff	114	127		
FL1\Mode	EG	EG		
FL1\CEG L0	–20	0		
FL1\CEG R1	27	16		
FL1\CEG L1	0	–18		
FL1\CEG R2	0	0		
FL1\CEG L2	0	0		
FL1\CEG R3	0	0		

	EL1	EL2	EL3	EL4
FL1\CEG L3	0	0		
FL1\CEG R4	0	0		
FL1\CEG L4	0	0		
FL1\CEG RR1	0	0		
FL1\CEG RL1	0	0		
FL1\CEG RR2	0	0		
FL1\CEG RL2	0	0		
FL1\R.Scale	0	0		
FL1\LS BP1	C1	C1		
FL1\LS BP2	G2	G2		
FL1\LS BP3	E4	E4		
FL1\LS BP4	C6	C6		
FL1\LS OFS1	0	0		
FL1\LS OFS2	0	0		
FL1\LS OFS3	0	0		
FL1\LS OFS4	0	0		
FL2\Type	THU	THU		
FL2\Cutoff	127	127		
FL2\Mode	LFO	LFO		
FL2\CEG L0	—	—		
FL2\CEG R1	—	—		
FL2\CEG L1	—	—		
FL2\CEG R2	—	—		
FL2\CEG L2	—	—		
FL2\CEG R3	—	—		
FL2\CEG L3	—	—		
FL2\CEG R4	—	—		
FL2\CEG L4	—	—		
FL2\CEG RR1	—	—		
FL2\CEG RL1	—	—		
FL2\CEG RR2	—	—		
FL2\CEG RL2	—	—		
FL2\R.Scale	—	—		
FL2\LS BP1	C1	C1		
FL2\LS BP2	G2	G2		
FL2\LS BP3	E4	E4		
FL2\LS BP4	C6	C6		
FL2\LS OFS1	0	0		
FL2\LS OFS2	0	0		
FL2\LS OFS3	0	0		
FL2\LS OFS4	0	0		
FL\Resonance	3	0		
FL\Vel.Sens	0	0		
FL\Mod.Sens	0	0		

CNTL\Pitch Bend	2
CNTL\AT P.Bias	0
CNTL\RandomPitch	0
CNTL\AMOD CTL#	12
CNTL\AMOD RNG	64
CNTL\PMOD CTL#	1
CNTL\PMOD RNG	64
CNTL\CoffMOD CTL#	1
CNTL\CoffMOD RNG	0
CNTL\Cutoff CTL#	12
CNTL\Cutoff RNG	0
CNTL\EG Bias CTL#	2
CNTL\EG Bias RNG	0
CNTL\Volume CTL#	14
CNTL\Volume MIN	0
EF\Type	1: Rev.Hall
EF\Output Level	100%
EF\ ** Others **	Time 2.6 / LPF 8.0 / Delay 29

Programming the "VeloChorus" Voice

Now that you've got the basic idea, try programming the VeloChorus voice described below. VeloChorus is a 2-element voice in which the "Chorus" waveform is assigned to element 1 and the "Styroll" waveform is assigned to element 2. Both waveforms are enveloped and filtered, and the Styroll waveform is "velocity switched" so it only appears — layered onto the chorus sound — when you play the keys on your keyboard quite hard.

Here's the Voice Parameter Chart for the VeloChorus voice.

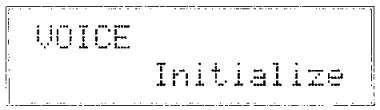
The changes are made in "real time" as you program. So don't be afraid to play the voice via your keyboard/controller as you program, to hear the sound as it gradually takes shape.

1. If it is not already selected, press [VOICE] to select the VOICE PLAY mode.

2. Use the [INTERNAL], [–1/NO] and [+1/YES] keys to select VOICE I01.

3. Press [EDIT/COMPARE] to enter the VOICE EDIT mode.

4. Press the [JOB] key, the numeric [4] and [2] keys, and then the [ENTER] key to select voice edit job 42: Voice Initialize.



5. The voice initialize function allows us to to create an "initialized" voice in which all parameters are set to their "standard" values. This is useful because the controller parameters — i.e. pitch wheel and modulation wheel — are also set to function normally, so we won't have to go to the trouble to program these particular parameters for this example ("REFERENCE" section, page 90).

   Press the [ENTER] key.

"Sure?" appears on the top line of the display, asking you to confirm you intention to initialize the voice. Press [+1/YES] to confirm and actually execute the initialize operation. "Completed!" will appear briefly when the initialization is finished.

6. Press the [PAGE ►] key once to move ahead to the VOICE Mode job ("REFERENCE" section, page 58).

7. Press the [+1/YES] key to change "=1 Element" to "=2 Element". This selects the 2-element voice configuration (the [–1/NO] and [+1/YES] keys are just one means of changing the value of a selected parameter in the edit modes — "REFERENCE" Section, page 53).

8. Press the [PAGE ►] key once to move ahead the AWM Wave Selection job ("REFERENCE" section, page 58).

9. When the 2-element mode is selected (as it should be after the last step), element 1 (EL1) and element 2 (EL2) are available and a different waveform from among the SY55's 74 preset waveforms can be assigned to each. The unavailable elements are represented by "***" on the display.

   The [◁] and [▷] cursor keys are used to move the cursor to the desired element (EL1 or EL2 will appear in the upper right-hand corner of the display), and the [DATA ENTRY] control, [+1/YES] and [–1/NO] keys, or numeric and [ENTER] keys are used to assign the desired wave to the selected element. The selected wave number is shown at the current cursor location, and the full name of the assigned wave is shown in the upper left-hand corner of the display.

   - With the cursor at the EL1 position, select the P31 (Chorus) waveform.
   - Move the cursor to the EL2 position by pressing [▷], then select the P56 (Styroll) waveform.

10. Press the [PAGE ►] key to move to the Volume job ("REFERENCE" section, page 47).

11. The volume job operates in basically the same way as the voice assignment job described above. The [◁] and [▷] cursor keys are used to select the element for which the volume is to be adjusted, then the [DATA ENTRY] control, [+1/YES] and [–1/NO] keys, or numeric and [ENTER] keys are used to set the desired volume. A setting of "0" produces no sound while a setting of "127" produces maximum volume.

    For the VeloChorus voice, leave the Chorus volume setting at the maximum of 127, and lower the Styroll setting to about 100.

12. Press the [JOB] key, the numeric [8] key, and then the [ENTER] key to select the Vel. Limit/L job ("REFERENCE" section, page 61). We'll skip the Note Shift ("REFERENCE" section, page 59), Detune, and Note Limit ("REFERENCE" section, page 60) jobs for this voice, since we don't need to detune or transpose the pitch of either of the waveforms in the VeloChorus voice, or set note limits to create a split keyboard setup.

13. The Velocity Limit job is where we setup the VeloChorus voice's interesting velocity switching feature. This job lets us set the lowest velocity value for a range of velocity values over which the element will produce output. A little more explanation is in order:

    Every MIDI "note on message" (the MIDI message that is transmitted every time a note is played on a keyboard or other MIDI controller) contains a "velocity" value that tells the tone generator how hard the note has been played. The range of MIDI velocity values is from 1 to 127 — thus the 1 ... 127 range of this function. By setting the low velocity limit of the Styroll element to about "55", the Styroll portion of the voice will only sound when a key is played hard enough to transmit a velocity value greater than 55. The low velocity limit of the Chorus waveform is left at "1" so that the Chorus element sounds no matter how hard or soft you play the keys.

    You should be getting quite familiar with the basic procedure by now: the [◁] and [▷] cursor keys are used to select the element for which the low velocity limit is to be set, and the [DATA ENTRY] control, [+1/YES] and [–1/NO] keys, or numeric and [ENTER] keys are used to set the low velocity limit.

14. Next select job 11: EF Balance ("REFERENCE" section, page 63), skipping the Vel. Limit/H ("REFERENCE" section, page 62) and Pan ("REFERENCE" section, page 62.

15. Set the EF Balance (Effect Balance) for EL1 and EL2 as follows:

    EL1 (Chorus) 50
    EL2 (Styroll) 60

16. Select job 13: Amplitude EG ("REFERENCE" section, page 64), skipping the OSC Frq.Mode ("REFERENCE" section, page 63) display.

17. Here we program the amplitude envelope generators for EL1 and EL2 — and learn a new element selection technique.

Element Selection: If you press and hold the [SELECT] key the element selection and switching display will appear.

On the upper display line "FL1" indicates that Filter 1 is selected and "EL1" indicates that Element 1 is selected. The lower display line indicates that the 2-element mode has been selected (elements 1 and 2 are active). The asterisks (*) indicate elements that are not available (3 and 4 in this case).

While the [SELECT] key is held, any of the available elements can be selected by pressing the corresponding [EL SEL] key (note the green markings next to the numeric [7], [4], [1] and [0] keys).

Also while the [SELECT] key is pressed, any of the available elements can also be turned ON or OFF (usually to hear how a single element in a multiple-element voice sounds) by pressing the corresponding [EL ON/OFF] key (the numeric [8], [5], [2] and [-] keys). An available element that has been turned OFF in this manner appears as a "-" on the display.

Releasing the [SELECT] key returns the display to the current job.

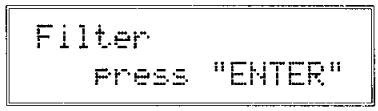
You know how to select elements, select parameters using the [◁] and [▷] keys, and change values using the [DATA ENTRY] control or [-1/NO] and [+1/YES] keys, so go ahead and program the various amplitude envelope generator parameters for each element as follows:

Hint: The arrow symbols (+ and +) that appear at either end of the display mean that more parameters can be accessed by moving the cursor in the indicated direction using the [◁] and [▷] keys.

18. Use the [PAGE ►] key to step through the next eight jobs yourself while referring to the VeloChorus Voice Chart on the previous page, checking all parameters and making adjustments when necessary.

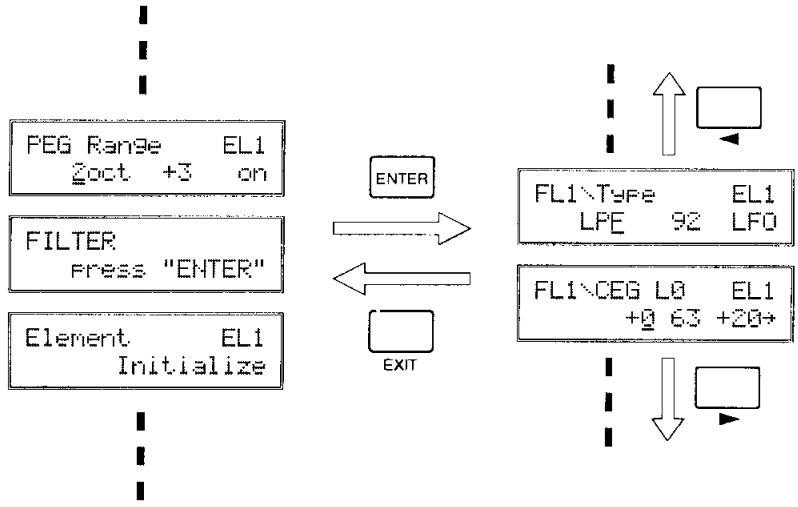
Parameter	E1 (Chorus)	E2 (Styroll)
AEG Mode	nrm	nrm
AEG R1 (Rate 1)	30	63
AEG R2 (Rate 2)	37	12
AEG L2 (Level 2)	59	50
AEG R3 (Rate 3)	28	30
AEG L3 (Level 3)	54	47
AEG R4 (Rate 4)	0	10
AEG RR (Release Rate)	30	30

19. When you get to this display:



It's time to learn a new technique.

The filter functions can be accessed by pressing the [ENTER] key from the above display — just like it says on the screen. Once you're "in" the filter function subset, you can move around using the [PAGE ◄] and [PAGE ►] keys just as you can anywhere else. When you're finished with the filter function subset, return to the main function set by pressing the [EXIT] key.



Of course you can also access any of the filter jobs by pressing the [JOB] key and entering the appropriate job number.

The filter 1 or filter 2 envelope generator can be selected by holding the [SELECT] key and pressing the numeric [9] or [6] key, respectively (this operation will also take you directly to the filter functions from anywhere within the voice edit mode).

Now that you're in the filter function subset, go ahead and program the filter parameters, referring to the VeloChorus voice parameter chart on page 40.

20. Next select job 40: Voice Name ("REFERENCE" section, page 89). Here we'll give our original voice a name: "VeloChorus".

21. The VOICE Name job allows a name of up to 10 characters to be assigned to the current voice. Use the [◁] and [▷] cursor keys to place the underline cursor under the character to be changed, then use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to select the desired character. Continue until the entire voice name has been programmed.

22. Press [VOICE] to exit from the edit mode and return to the VOICE mode. The reversed letter "E" that appears to the right of the voice number indicates that the voice has been edited.

Caution!!: If you select a different voice or mode at this point, the edited voice will be erased. To keep an edited voice, it must be stored to an INTERNAL or CARD memory location, as described in the following section. For a special method of recalling a voice lost in this way, see "VOICE RECALL" on page 89.

Storing an Edited Voice

Now that you've created your first original voice — "VeloChorus" — you'll want to store it to one of the SY55's 64 internal voice memory locations or a memory card location.

1. After exiting the edit mode by pressing the [VOICE] key, press the [STORE/COPY] key. The following display will appear:

The voice number on the top line indicates the source setup — i.e. the "VeloChorus" voice we just created in the SY55's edit buffer memory. The voice number after the arrow on the bottom line is the target voice — i.e. the memory location to which we will store the edited voice.

2. The target memory location can be changed by using the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys. The [INTERNAL] and [CARD] keys can be used to change banks, if necessary (obviously you can't store to the read-only PRESET bank, or to a card if no card is loaded).

Note: If you intend to store the voice to a memory card, make sure that the card has been properly formatted ("REFERENCE" section, page 138), and that the card's WRITE PROTECT switch is turned OFF (refer to the MCD64 or MCD32 Memory Card instructions for details).

3. When you're satisfied with the target memory location selection, press [ENTER].

"Sure?" appears on the top line of the display, asking you to confirm you intention to store to the selected target location. This confirmation step is important because once you store, all previous data in the target location is erased and completely replaced by the new data.

4. Press [+1/YES] to confirm and actually execute the store operation, or [–1/NO] to cancel. "Executing!" will appear on the display during store, and "Completed!" will appear briefly when the store operation is finished.

Your "VeloChorus" voice has now been stored and can be recalled whenever needed!

Note: Refer to the "ERROR MESSAGES" section on page 144 for information on memory-card related error messages.

Conclusion

Well that's about it. You've learned the basics of getting around in the SY55's play and edit modes. Be sure to read the "General Operation" sections in the reference section for more important operating techniques. The voice edit mode, for example, offers element, AEG and effect copy functions that can make the job of programming voices much faster and more efficient.

If you've carefully gone through all five tutorials, you should now be able to handle just about any SY55 job simply by referring to the reference section.

REFERENCE SECTION

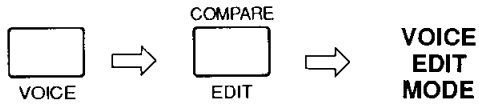
VOICE EDIT MODE

Contents

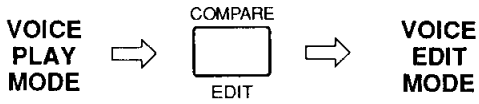
GENERAL OPERATION

Selecting the Voice Edit Mode

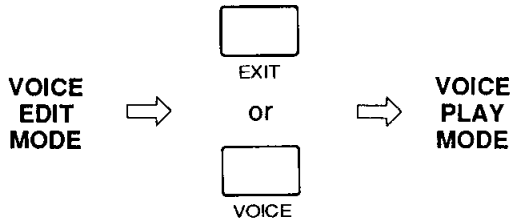
Press the [VOICE] key followed by the [EDIT/COMPARE] key. Both the [VOICE] and [EDIT/COMPARE] key indicators should be lit.



If the VOICE PLAY mode is already selected (i.e. the [VOICE] key indicator is lit), it is only necessary to press the [EDIT/COMPARE] key.



You can exit the voice edit mode and return to the voice play mode at any time by pressing either the [VOICE] key or the [EXIT] key.



Selecting the Various Edit Mode Jobs

Once the voice edit mode has been selected, two different methods can be used to select the various voice editing jobs.

Method 1: Page Access.

The [PAGE ◄] and [PAGE ►] keys can be used to scroll forward and backward through the editing jobs.

- To step forward through the voice edit job list.
- Hold for continuous scrolling.

- To step backward through the voice edit job list.
- Hold for continuous scrolling.

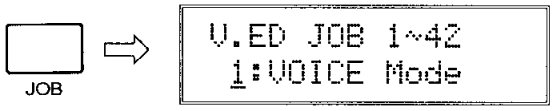
In some cases a display screen accessed by the [PAGE ◄] and [PAGE ►] keys will actually be a "doorway" to a separate list of jobs relating to that function. In the voice edit mode, the FILTER, CONTROLLER and EFFECT jobs are of this type. When "Filter" is selected, for example, "press ENTER" will appear on the bottom line of the display.

When you press [ENTER], the [PAGE ◄] and [PAGE ►] keys can be used to access a whole subset of FILTER jobs. When you're finished editing filter jobs, press the [EXIT] key to return to the primary job list.

Method 2: Direct Job Number Entry.

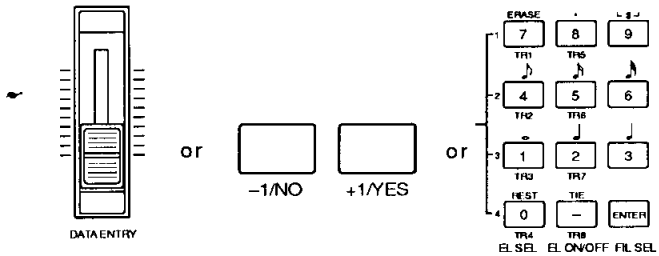
All edit mode jobs have a "job number." These are listed along with the job names throughout the reference section of this manual. Any editing job can be directly accessed by first pressing the [JOB] key, and then selecting the desired job number using the [DATA ENTRY] control, the [-1/NO] and [+1/YES] keys, or the numeric and [ENTER] keys.

When the [JOB] key is pressed, the job selection display appears showing the currently selected job.



On the upper display line "V.ED JOB 1—42" means that you are in the voice edit mode (V.ED) and that you have a choice of jobs 1 through 42 (JOB 1—42).

You can now select the desired job number by using the [DATA ENTRY] control, the [–1/NO] and [+1/YES] keys, or the numeric keys.



• To select the desired job number.

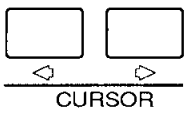
If you use the numeric keys, the entered number will flash on the display. Confirm that the desired job name appears on the display, then press the [ENTER] key to go directly to the selected job.

Selecting and Editing Parameter Values

Some jobs only have a single parameter, while others contain several that must be selected using the [◁] and [▷] cursor keys. In many cases the [◁] and [▷] keys are used to select one of the available elements in a multi-element voice.

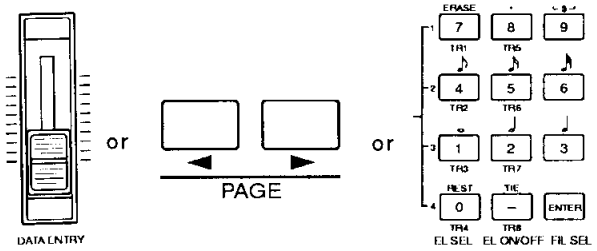
The value of a selected parameter is adjusted using the [DATA ENTRY] control, the [–1/NO] and [+1/YES] keys, or the numeric and [ENTER] keys.

1:



• To select desired element or parameter.

2:



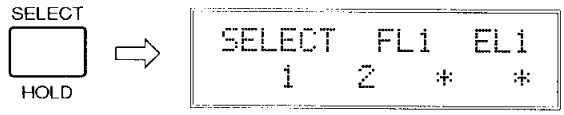
• To edit value of selected element or parameter.

When using the numeric keys, first enter the desired value in one, two, or three digits (the value will flash on the display), then press the [ENTER] key (the value will stop flashing). In general, if you enter a value higher than the maximum value or lower than the minimum value for the selected parameter, the maximum or minimum value will be selected, respectively, when the [ENTER] key is pressed. The numeric [–] key can be used to make positive values negative, and vice versa, for parameters which accept negative values.

Selecting an Element to Edit/Element ON-OFF Switching

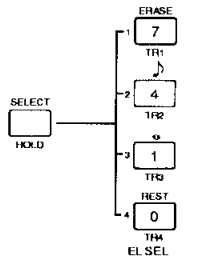
Although the ◁ and ▷ cursor keys are used to select a particular element in many functions, some functions that can be individually programmed for each element contain several different parameters which must be selected using the ◁ and ▷ keys, so an alternative means of element selection has been provided.

If you press and hold the [SELECT] key the element selection and switching display will appear.

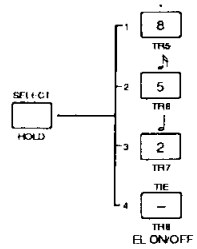


On the upper display line "FL1" indicates that Filter 1 is selected and "EL1" indicates that Element 1 is selected. The lower display line indicates that the 2-element mode has been selected (elements 1 and 2 are active). The asterisks (*) indicate elements that are not available (3 and 4 in this case).

While the [SELECT] key is held, any of the available elements can be selected by pressing the corresponding [EL SEL] key (note the green markings next to the numeric [7], [4], [1] and [0] keys).



Also while the [SELECT] key is pressed, any of the available elements can also be turned ON or OFF (usually to hear how a single element in a multiple-element voice sounds) by pressing the corresponding [EL ON/OFF] key (the numeric [8], [5], [2] and [-] keys). An available element that has been turned OFF in this manner appears as a "-" on the display.



Releasing the [SELECT] key returns the display to the current function.

Edit/Compare Operation

Normally, when you play a voice that is being edited in the voice edit mode you hear the sound of the edited voice. This can be compared with the original (pre-edit) sound by pressing the [EDIT/COMPARE] key to activate the COMPARE mode. The [EDIT/COMPARE] key indicator will flash while the COMPARE mode is active. Press the [EDIT/COMPARE] key again to return to the VOICE EDIT mode.

NOTE: While the COMPARE mode is active it is not possible to select any other functions. The [EXIT] key can be used, however, to return to the voice play mode.

NOTE: When the compare function is used, the contents of the TG55 "recall buffer" are replaced with the current contents of the edit buffer (i.e. the current status of the voice being edited). This can affect the outcome of a VOICE RECALL operation — see "VOICE RECALL" on page 77.

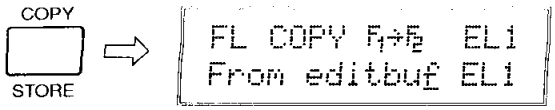
The Element, AEG and Filter Copy Functions

The Element, AEG and Filter Copy functions make it possible to copy all parameter assignments, just the AEG parameter assignments, or just the filter parameter assignments from any other element to the element currently being edited. This is useful if, for example, you want to create an AEG curve that is the same as, or varies only slightly from, one that already exists.

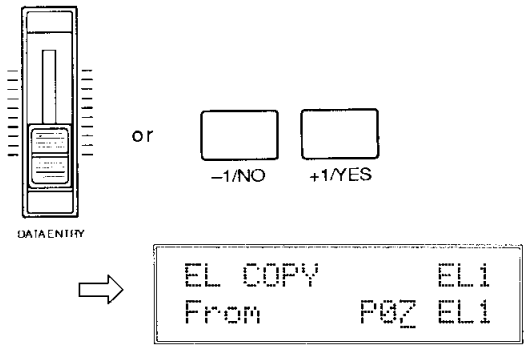
1. Make sure the voice edit mode is engaged and that any function other than one of the EFFECT, AEG or FILTER functions is selected if you want to copy all element parameters, that one of the AEG functions is selected if you want to copy the AEG parameters, or that one of the FILTER functions is selected if you want to copy the filter parameters.

2. Select the element to which the new parameter data will be copied using the standard element selection procedure described above.

3. Press the [STORE/COPY] key. One of the following displays will appear, depending on the currently selected function.



4. Next, select the voice from which the parameter data is to be copied by using the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys. "editbuf" refers to the voice that is currently being edited, and other voices can be selected by using standard procedure — [INTERNAL], [CARD], or [PRESET] key to select voice bank; [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to select the voice.



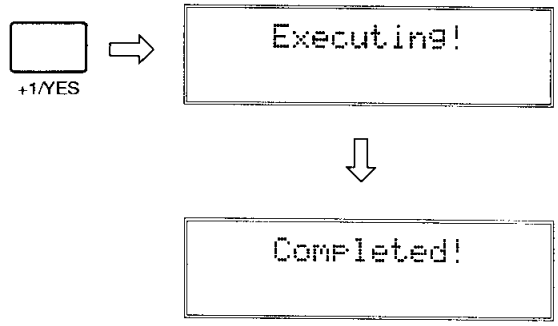
5. Move the underline cursor to the element parameter to the right by pressing the [▷] key, then choose the particular element of the selected voice you want to copy the data from using the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys.* If the element number appears in reverse, the voice does not use that element and no data is available.

   * For Filter Copy, the "editbuf" setting allows copying parameters from filter 1 to filter 2, or vice versa, when copying within the same element (e.g. EL1 → EL1). In this case, the filter to be copied to must be selected prior to pressing [STORE/COPY] key by holding the [SELECT] key and pressing either the numeric [9] or [6] key. "F2→F1" or "F1→F2" will appear on the upper line of the display to show the selected copy direction.

6. When the elements to and from which the data is to be copied have been properly selected, press the [ENTER] key. "Sure?" will appear on the top line of the LCD.

7. Press the [+1/YES] key to confirm and actually execute the copy operation, or [–1/NO] to cancel. "Executing! will appear briefly on the display while the data is being copied, then "Completed!" will appear for a few seconds when the copy operation has been successfully completed.

8. When the copy operation has finished, the SY55 will return automatically to the display that was showing immediately prior to activation of the element copy function.



The Effect Copy Function

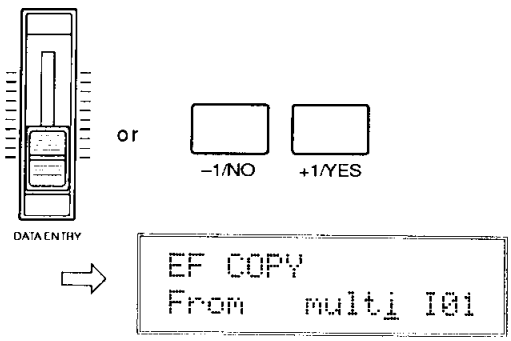
The Effect Copy function makes it possible to copy the effect parameter assignments from any other voice or multi-timbral setup to the voice currently being edited.

1. Make sure the voice edit mode is engaged and that one of the EFFECT functions is selected.

2. Press the [STORE/COPY] key. The following display will appear.

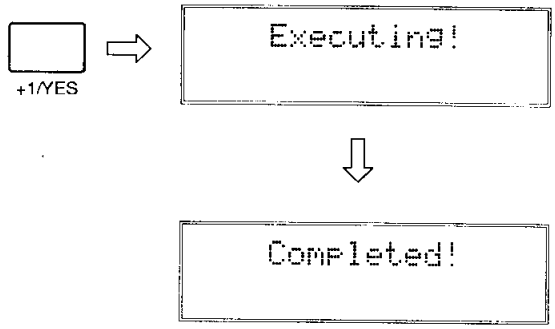
3. Use the [◁] and [▷] cursor keys to move to the Multi/Voice parameter and select "Multi" if you want to copy the effect parameters from a multi-timbral setup, or "Voice" if you want to copy the effect parameters from a preset or internal voice.

4. Next, move the cursor to the multi or voice number parameter by pressing the [▷] key, and select the multi-timbral setup or voice from which the parameter data is to be copied by using the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys. The [INTERNAL], [CARD], or [PRESET] key can be used to select the "P" (preset) or "I" voice bank if necessary.



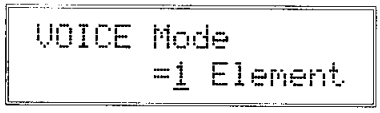
5. Press the [ENTER] key. "Sure?" will appear on the top line of the LCD.

6. Press the [+1/YES] key to confirm and actually execute the copy operation, or [–1/NO] to cancel. "Executing! will appear briefly on the display while the data is being copied, then "Completed!" will appear for a few seconds when the copy operation has been successfully completed.



7. When the copy operation has finished, the SY55 will return automatically to the display that was showing immediately prior to activation of the effect copy function.

VOICE MODE — JOB 1



Summary: Determines whether the voice will be a 1-element (max. 16-note polyphony), 2-element (max. 8-note polyphony) or 4-element (max. 4-note polyphony) type.

Settings: 1 Element, 2 Element, 4 Element.

Procedure: The [DATA ENTRY] control or [+1/YES] and [–1/NO] keys are used to select the desired number of elements.

Details: The number of elements used in a voice basically determines the number of different waveforms that can be played simultaneously: one waveform in the 1-element mode, two waveforms in the 2-element mode, and four waveforms in the 4-element mode. Since each individual element has its own waveform, filters, envelope generator, etc., the waveforms in a multi-element voice can be combined in several different ways. They can simply be played simultaneously, limited to specific regions of the keyboard to create a "split keyboard" voice, one waveform could be used only for the attack portion of the voice while another is used for the sustain, and so on.

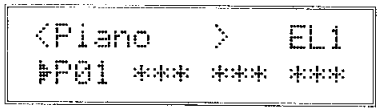
When selecting the 2- or 4-element mode, always keep in mind the fact that these modes reduce the number of notes you can play at the same time:

Mode	Polyphony
1-element mode:	16 notes
2-element mode:	8 notes
4-element mode:	4 notes

The tutorial goes into further detail concerning the use of the multi-element modes.

Refer to: Tutorial, page 35...37, 42.

AWM WAVE SELECTION — JOB 2



Summary: Assigns a preset or card wave to each active voice element.

Settings:
P01 ... P58 (preset voices)
P59 ... P74 (preset drums)
C01 ... max. C99 (card voices)

Procedure: When the 1-element mode is selected (as in the example LCD display, above), only a single wave may be assigned. The unavailable elements are each represented by " *** " on the display.

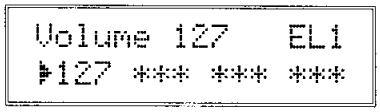
If the 2- or 4-element mode is selected, different waves may be assigned to each available element. The [◁] and [▷] cursor keys are used to move the cursor to the desired element (EL1, EL2, EL3 or EL4 will appear in the upper right-hand corner of the display), and the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys are used to assign the desired wave to the selected element. The wave number (P01 ... P74, C01 ... C99) is shown at the current cursor location, and the full name of the assigned wave is shown in the upper left-hand corner of the display.

Details: Completely different waves can be assigned to each element, but it is also possible to assign the same wave to different elements. In this case

the waves can be filtered differently and/or have different envelopes to create an endless range of interesting effects.

Refer to: Tutorial, page 35, 42.

VOLUME — JOB 3



Summary: Allows individual adjustment of element volume as well as overall (total) volume adjustment.

Settings: 0 ... 127

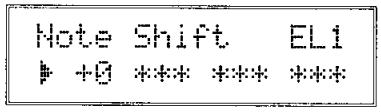
Procedure: The [◁] and [▷] cursor keys are used to select the element for which the volume is to be adjusted, or overall "Total" volume control (EL1, EL2, EL3, EL4 or Total will appear in the upper right-hand corner of the display). Unavailable elements are represented by " *** " on the display. The [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys are used to set the desired volume.

Details: A setting of "0" produces no sound while a setting of "127" 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. Overall volume adjustment can be used to match the the overall level of different voices.

Refer to: Tutorial, page 42.

NOTE SHIFT — JOB 4



Summary: Individually shifts the pitch of each active element up or down in semitone steps.

Settings: –64 ... +63.

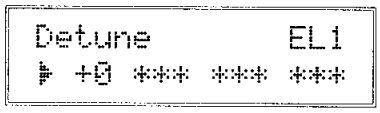
Procedure: The [◁] and [▷] cursor keys are used to select the element to be note-shifted (EL1, EL2, EL3 or EL4 will appear in the upper right-hand corner of the display). Unavailable elements are represented by " *** " on the display. The [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys are used to set the desired degree of note 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 Note Shift function can be used to transpose a voice to its most useful range, or to create harmony (intervals) between different elements in a multi-element voice.

Refer to: Utility mode "TRANSPOSE," page 132.

DETUNE — JOB 5



Summary: Allows slight upward or downward pitch adjustment of each active element.

Settings: –7 ... +7

Procedure: The [◁] and [▷] cursor keys are used to select the element to be detuned (EL1, EL2, EL3 or EL4 will appear in the upper right-hand corner of the display). Unavailable elements are represented by " *** " on the display. The [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys are used to set the desired degree of detuning.

Details: The maximum minus setting of "–7" produces a downward pitch shift of approximately a quarter of a semitone, and the maximum plus setting of "+7" produces an upward pitch shift of approximately the same amount. A setting of "0" produces no pitch change.

The Detune function allows different elements in a multi-element voice to be slightly detuned in relation to each other, thereby "thickening" the overall sound.

Refer to: "OSCILLATOR MODE/NOTE/TUNE," page 63.

LOW NOTE LIMIT — JOB 6

Summary: Individually sets the low note limit for each active element (the lowest note that each element will produce).

Settings: C–2 ... G8

Procedure: The [◁] and [▷] cursor keys are used to select the element for which the low note limit is to be set (EL1, EL2, EL3 or EL4 will appear in the upper right-hand corner of the display). Unavailable elements are represented by " *** " on the display. The [DATA ENTRY] control or [+1/YES] and [–1/NO] keys are used to set the low note limit.

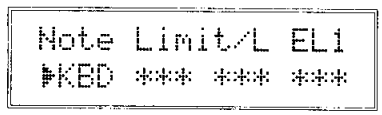
The low note limit can also be set by pressing the [ENTER] key — "KBD" will flash on the display — and then the key on the keyboard corresponding to the desired low note.

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.

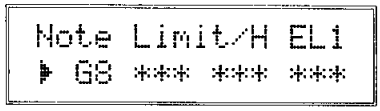
This function, in conjunction with the High Note Limit function described below, allows the sound from an element to be limited to a specific region of the keyboard (or scale of other types of MIDI controllers). If the Low Note Limit is set to C3 and the High Note Limit for the same element is set to C4, for example, the sound from that element 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 for the same element, the full range of notes (C–2 ... G8) will be produced.

Refer to: Tutorial, page 36. "HIGH NOTE LIMIT" on page 61.



HIGH NOTE LIMIT — JOB 7



Summary: Individually sets the high note limit for each active element (the highest note that each element will produce).

Settings: C–2 ... G8

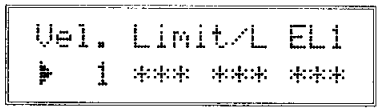
Procedure: The [◁] and [▷] cursor keys are used to select the element for which the high note limit is to be set (EL1, EL2, EL3 or EL4 will appear in the upper right-hand corner of the display). Unavailable elements are represented by " *** " on the display. The [DATA ENTRY] control or [+1/YES] and [–1/NO] keys are used to set the high note limit.

The high note limit can also be set by pressing the [ENTER] key — "KBD" will flash on the display — and then the key on the keyboard corresponding to the desired high note.

Details: See "LOW NOTE LIMIT," above.

Refer to: Tutorial, page 36. "LOW NOTE LIMIT" on page 60.

LOW VELOCITY LIMIT — JOB 8



Summary: Sets the lowest velocity value for a range of velocity values over which each active element will produce output.

Settings: 1 ... 127

Procedure: The [◁] and [▷] cursor keys are used to select the element for which the low velocity limit is to be set (EL1, EL2, EL3 or EL4 will appear in the upper right-hand corner of the display). Unavailable elements are represented by " *** " on the display. The [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys are used to set the low velocity limit.

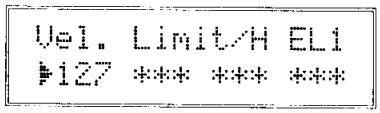
The low velocity limit can also be set by pressing the [ENTER] key — "KBD" will flash on the display — and then a key on the keyboard at approximately the desired velocity.

Details: Every MIDI "NOTE ON MESSAGE" (the MIDI message that is transmitted every time a note is played on a keyboard or other MIDI controller) contains a "velocity" value that tells the tone generator how hard the note has been played. The range of MIDI velocity values is from 1 to 127 — thus the 1 ... 127 range of this function.

The Low Velocity Limit function, in conjunction with the High Velocity Limit function described below, makes it possible to specify a range of velocity values over which the selected element will produce sound. You could, for example, set Low Velocity Limit to "60" and High Velocity Limit to "127." This would cause that element to produce output **only** when a velocity value between 60 and 127 was received — i.e. when a fairly loud note is played. A second element could then be set to produce output only when velocity values below 60 are received, so that completely different sounds are produced on soft and loud notes.

Refer to: Tutorial, page 43. "HIGH VELOCITY LIMIT" on page 62.

HIGH VELOCITY LIMIT — JOB9



Summary: Sets the highest velocity value for a range of velocity values over which each active element will produce output.

Settings: 1 ... 127

Procedure: The [◁] and [▷] cursor keys are used to select the element for which the high velocity limit is to be set (EL1, EL2, EL3 or EL4 will appear in the upper right-hand corner of the display). Unavailable elements are represented by " *** " on the display. The [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys are used to set the high velocity limit.

The high velocity limit can also be set by pressing the [ENTER] key — "KBD" will flash on the display — and then a key on the keyboard at approximately the desired velocity.

Details: See "LOW VELOCITY LIMIT," above.

Refer to: Tutorial, page 43. "LOW VELOCITY LIMIT" on page 61.

PANNING — JOB 10

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

Settings: -31 ... +31

Procedure: The [◁] and [▷] cursor keys are used to select the element for which the pan position is to be set (EL1, EL2, EL3 or EL4 will appear in the upper right-hand corner of the display). Unavailable elements are represented by " *** " on the display. The [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys are used to set the pan position.

The upper line of the display also shows a graphic representation of the stereo sound field with "L" representing "left" and "R" representing "right." As you change the pan value the vertical bar will appear at the corresponding position on the graphic display.

Details: Minus values represent panning to the left, and positive values represent panning to the right. "0" positions the sound of the selected element in the center of the stereo sound field.

For a single-element voice the Pan position should generally be set to center ("0") unless you have some specific reason why you want the sound to appear only at the L/MONO or R output jack. In multi-element voices interesting stereo effects can be produced by placing the output from different elements at different locations in the stereo sound field.

Refer to: "THE CONTROLS AND CONNECTORS," page 7.

EFFECT BALANCE — JOB 11

Summary: Determines the balance between the direct and effect sound for each active element.

Settings: 0 ... 100

Procedure: The [◁] and [▷] cursor keys are used to select the element for which the effect balance is to be set (EL1, EL2, EL3 or EL4 will appear in the upper right-hand corner of the display). Unavailable elements are represented by "***" on the display. The [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys are used to set the effect balance.

Details: A setting of "0" produces only the direct sound of the selected element, while a setting of "100" produces only the effect sound. A setting of "50" delivers both the direct and effect sound in approximately equal proportions.

The effect (reverb, delay, etc.) applied to the voice is selected and edited using the EFFECT functions described on page 86.

Refer to: Tutorial, page 43. "EFFECT: TYPE/OUTPUT LEVEL" on page 85. "EFFECT: EFFECT PARAMETERS" on page 86. Utility mode "EFFECT" on page 133.

OSCILLATOR MODE/NOTE/TUNE — JOB 12

● Frequency Mode

Summary: Determines whether the AWM wave for the selected element is reproduced in the normal (variable pitch) or fixed-pitch mode.

Settings: norm, fix

Procedure: If the Frequency Mode ("Frq.Mode" on upper LCD line) parameter is not already selected, use the [◁] and [▷] cursor keys to select it. Use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to select the "fix" or "norm" setting.

Details: Normally you want the pitch of the AWM wave (or waves) used in a voice to be controllable from a keyboard or other type of controller, so this parameter will be set to "norm" for most applications.

In some cases — sound effects in particular — you might want the same pitch to be produced no matter what note you play on the keyboard or other controller. In this case, the "fix" mode is appropriate. The Frequency Note parameter described below can be used to set the note produced when the "fix" mode is selected.

● Frequency Note

Summary: Sets the frequency (note) of the AWM wave for the selected element when the "fix" mode (above) is selected.

Settings: C–2 ... G8

Procedure: The "Frq.Note" parameter **only** appears when the "Frq.Mode" parameter described above has been set to "fix."

Use the [◁] and [▷] cursor keys to select the Frequency Note ("Frq.Note") parameter. Use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to select the desired note.

The frequency note can also be set by pressing the [ENTER] key — "KBD" will flash on the display — and then the key on your keyboard corresponding to the desired note.

Details: The C–2 to G8 range of this parameter covers a full 10-1/2 octaves. "C3" corresponds to "middle C" on a keyboard.

Refer to: "NOTE SHIFT," page 59.

● Frequency Tune

Summary: Allows tuning of the AWM wave assigned to the selected element.

Settings: –64 ... +63

Procedure: Use the [◁] and [▷] cursor keys to select the Frequency Tune ("Frq.Tune") parameter. Use the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the tuning as required.

Details: Each tuning increment corresponds to a 75/64-cent change in pitch. The entire tuning range is therefore 75/64 x 127 (i.e. 64 + 63 increments) — almost 150 cents. Since 100 cents equals one semitone, the tuning range is approximately one and a half semitones. A setting of "0" produces normal pitch (A3 = 440 Hertz).

Please note that this parameter is used to individually tune different elements within a voice. Overall tuning control is provided by the MASTER tune function in the UTILITY mode.

Refer to: "MASTER TUNE" on page 132. "DETUNE" on page 60.

AMPLITUDE ENVELOPE GENERATOR (AEG) MODE/LEVEL/RATE

JOB 13

Summary: All the parameters within this function determine the "shape" of the amplitude envelope of the selected element.

Settings:

Mode parameter: nrm, hld

R1/HT, R2, L2, R3, L3, R4 and RR parameters: 0 ... 63

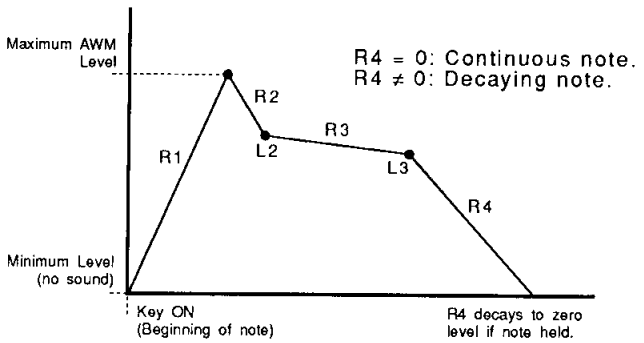
Procedure: If the Mode ("Mode" on upper LCD line) parameter is not already selected, use the [◁] and [▷] cursor keys to select it, then use the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys to select the "nrm" (normal) or "hld" (hold) setting. Once the desired mode has been selected, use the [◁] and [▷] cursor keys to select the various rate and level parameters in turn (R1/HT, R2, L2, R3, L3, R4 and RR), using the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys, or numeric and [ENTER] keys to set the value of each. "R1" (Rate 1) will appear

when the "nrm" mode has been selected, but "HT (Hold Time) will appear instead when the "hld" mode is selected.

The arrow symbols (⊹ and ⊹) that appear at either end of the display mean that more parameters can be accessed by moving the cursor in the indicated direction using the [◁] and [▷] keys.

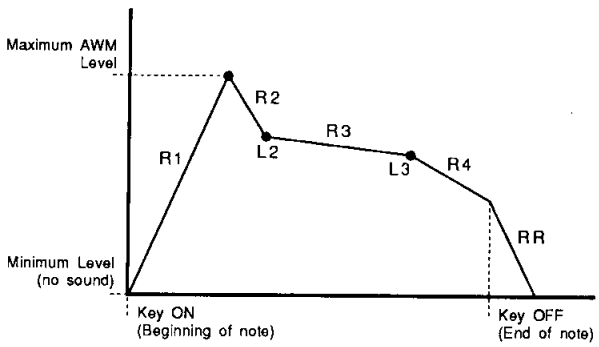
Details:

The "nrm" and "hld" mode settings affect the initial attack of the sound, determining how the amplitude envelope begins. In the "nrm" mode, the envelope begins from zero level, reaching the maximum AWM level at a rate determined by the R1 (Rate 1) parameter. In this mode there will always be a slight delay between the initiation of a note and maximum level. The following two diagrams show the kind of envelopes that can be produced in the "nrm" mode.

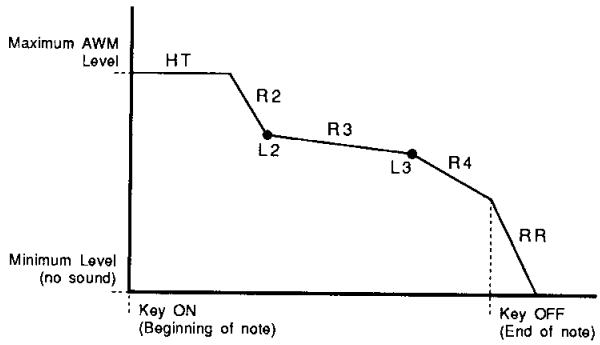


The envelop begins at zero level, reaches maximum level at the rate determined by the R1 parameter, moves to L2 (Level 2) at R2 (Rate 2), moves on to L3 (Level 3) at R3 (Rate 3), and finally decays to zero level at R4 (Rate 4) if the note is held the entire time.

If the note is released before the end of the envelope described above, then the sound decays to zero level from the point at which the note is released at the rate determined by the RR (Release Rate) parameter.



If the "hld" mode is selected, the envelope begins immediately from maximum AWM level, allowing the fast attack transients of waveforms to pass unaffected. In this case the R1 parameter is replaced by the HT (Hold Time) parameter. The HT parameter determines the length of time between the beginning of the envelope and the point at which the envelope begins to move towards L2 (Level 2) at R2 (Rate 2), as shown below.



For the level parameters, a setting of "0" corresponds to the lowest possible level (no sound) while a setting of "63" produces the highest output level. A "0" rate parameter setting produces the slowest rate between levels, while the maximum setting of "63" produces the fastest (almost instantaneous) change.

Refer to: Tutorial, page 36, 44.

AMPLITUDE ENVELOPE GENERATOR (AEG) RATE SCALING JOB 14

Summary: Allows the overall amplitude envelope generator decay rate for the selected element to be varied across the entire pitch range.

Settings: –7 ... +7

Procedure: Use the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the desired degree of rate scaling.

Details: Plus ("+") settings produce a longer overall envelope time for the low notes and a shorter envelope time for the high notes. This is useful for simulating instruments such as piano, in which the low notes take much longer to decay than the high notes. The maximum "+7" setting produces the greatest envelope length variation across the pitch range. Minus ("–") settings produce the opposite effect — short low notes and long high notes. A setting of "+0" results in no envelope length variation.

Refer to: "AMPLITUDE ENVELOPE GENERATOR (AEG) MODE/LEVEL/RATE," page 64.

AMPLITUDE ENVELOPE GENERATOR (AEG) LEVEL SCALE BREAKPOINT JOB 15

Summary: Allows four separate amplitude envelope generator level-scaling breakpoints to be set at any notes between C–2 and G8 for the selected element.

Settings: C–2 ... G8

Procedure: Use the [◁] and [▷] cursor keys to select the desired breakpoint (BP1, BP2, BP3 and BP4, from left to right), then use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to set the breakpoint note.

The breakpoint can also be set by pressing the [ENTER] key — "KBD" will flash on the display — and then the key on the keyboard corresponding to the desired breakpoint.

Details: Level scale offset values are applied to each of the breakpoints using the LEVEL SCALE OFFSET function described below. Natural level variations can thereby be produced across the range of the controlling keyboard. No breakpoint can be set to a key lower than the breakpoint to its left.

Refer to: "AMPLITUDE ENVELOPE GENERATOR (AEG) LEVEL SCALE OFFSET" below.

AMPLITUDE ENVELOPE GENERATOR (AEG) LEVEL SCALE OFFSET JOB 16

Summary: Sets the amount of level offset for each of the four level-scaling breakpoints set in the "AMPLITUDE ENVELOPE GENERATOR (AEG) LEVEL SCALE BREAKPOINT" function described above.

Settings: –127 ... +127

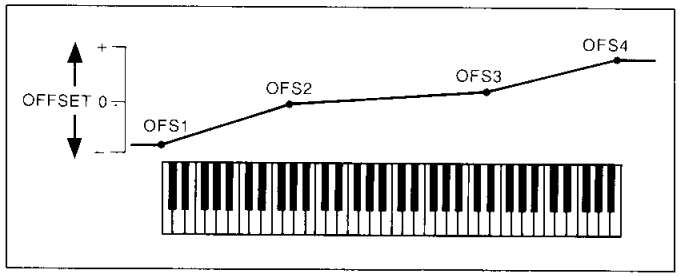
Procedure: Use the [◁] and [▷] cursor keys to select the desired offset parameter (OFS1, OFS2, OFS3 and OFS4, from left to right), then use the

[DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the level-scaling offset for the corresponding breakpoint.

Details: Negative values reduce the level, and positive values increase the level at the corresponding breakpoint. No matter what value is chosen, the EG level will never exceed its maximum of 63.

When different offsets are set for adjacent breakpoints, the level varies accordingly and smoothly between the breakpoints.

Refer to: "AMPLITUDE ENVELOPE GENERATOR (AEG) LEVEL SCALE BREAKPOINT" on page 66.



SENSITIVITY (VELOCITY, AMPLITUDE & PITCH MODULATION) JOB 17

● Velocity Sensitivity

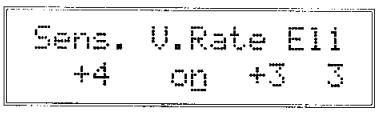
Summary: Determines how the output level of the selected element changes in response to velocity changes (e.g. keyboard dynamics).

Settings: –7 ... +7

Procedure: If the Velocity Sensitivity ("Vel." on upper LCD line) parameter is not already selected, use the [◁] and [▷] cursor keys to select it. Use the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to select the required degree of 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. The maximum setting of "+7" produces the maximum level variation in response to velocity changes. Minus "–" settings produce the opposite effect: lower level in response to higher velocity. A setting of "+0" results in no level variation. Make sure that the volume is turned down when making "–" settings, or you may not be able to hear the full effect.

● Velocity Rate Sensitivity ON/OFF



Summary: Determines whether overall envelope length of the amplitude envelope generator for the selected element will or will not be controlled by velocity information.

Settings: on, off

Procedure: Use the [◁] and [▷] cursor keys to select the Velocity Rate Sensitivity parameter ("V.Rate"). Use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to select "on" or "off."

Details: When this parameter is turned "on," higher velocity values produce a faster attack rate. When "off" no envelope rate variation is produced.

Refer to: "AMPLITUDE ENVELOPE GENERATOR (AEG) MODE/LEVEL/RATE," page 64.

● Amplitude Modulation Sensitivity

Summary: Determines the sensitivity of the selected element to amplitude modulation (tremolo effect) applied via the low-frequency oscillator (LFO) and appropriate controllers.

Settings: –7 ... +7

Procedure: Use the [◁] and [▷] cursor keys to select the Amplitude Modulation Sensitivity parameter ("AMS"). Use the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the required degree of amplitude modulation sensitivity.

Details: A setting of "0" allows no amplitude modulation by any means, while a setting of "+7" results in maximum sensitivity to amplitude modulation. Minus settings produce reverse EG bias — i.e. a higher modulation value produces lower level.

When setting up the low-frequency oscillator or a controller to apply amplitude modulation, this parameter must be set to a value other than "0" for amplitude modulation to take place.

Refer to: "LOW FREQUENCY OSCILLATOR (LFO) WAVEFORM/SPEED/DELAY/PHASE" on page 69. "LOW FREQUENCY OSCILLATOR MODULATION DEPTH, AMPLITUDE/PITCH/CUTOFF" on page 70. "CONTROLLER" functions from page 81 to page 84.

● Pitch Modulation Sensitivity

Summary: Determines the sensitivity of the selected element to pitch modulation (vibrato effects) applied via appropriate controllers.

Settings: 0 ... 7

Procedure: Use the [◁] and [▷] cursor keys to select the Pitch Modulation Sensitivity parameter ("PMS"). Use the [DATA ENTRY] control, [–1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the required degree of pitch modulation sensitivity.

Details: A setting of "0" allows no pitch modulation by any means, while a setting of 7 results in maximum sensitivity to amplitude modulation.

When setting up the low-frequency oscillator or a controller to apply pitch modulation, this parameter must be set to a value other than "0" for pitch modulation to take place.

Refer to: "LOW FREQUENCY OSCILLATOR (LFO) WAVEFORM/SPEED/DELAY/PHASE" on page 69. "LOW FREQUENCY OSCILLATOR MODULATION DEPTH, AMPLITUDE/PITCH/CUTOFF" on page 70. "CONTROLLER" functions from page 81 to page 84.

LOW FREQUENCY OSCILLATOR (LFO) WAVEFORM/SPEED/DELAY/PHASE

JOB 18

● Wave

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

Settings: tri, dwn, up, squ, sin, S/H

Procedure: If the Wave parameter is not already selected, use the [◁] and [▷] cursor keys to select it. Use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to select the desired LFO waveform.

Details:
"tri" = Triangle.
"dwn" = Downward sawtooth.
"up" = Upward sawtooth.
"squ" = Square.
"sin" = Sine.
"S/H" = Sample and hold.

Refer to: "SENSITIVITY (VELOCITY, AMPLITUDE & PITCH MODULATION," page 67.

● Speed

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

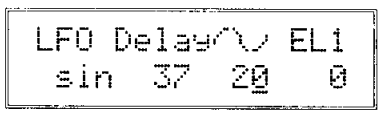
Settings: 0 ... 99

Procedure: Use the [◁] and [▷] cursor keys to select the Speed parameter. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the desired LFO speed.

Details: "0" produces the slowest LFO speed, and "99" produces the fastest LFO speed.

Refer to: "SENSITIVITY (VELOCITY, AMPLITUDE & PITCH MODULATION," page 67.

● Delay



Summary: Sets the delay time between the beginning of a note and the beginning of LFO operation for the selected element.

Settings: 0 ... 99

Procedure: Use the [◁] and [▷] cursor keys to select the Delay parameter. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the desired LFO delay.

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

Refer to: "SENSITIVITY (VELOCITY, AMPLITUDE & PITCH MODULATION," page 67.

● Phase

Summary: Determines at which point in the LFO waveform the LFO will begin operation for the selected element.

Settings: 0 ... 99

Procedure: Use the [◁] and [▷] cursor keys to select the Phase parameter. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the desired LFO phase.

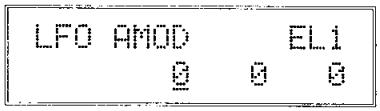
Details: If the LFO is used for pitch modulation, for example, a phase setting of "0" would cause the vibrato effect to begin with an upward pitch sweep, while a setting of "55" would cause the vibrato to begin with a downward pitch sweep. The change can be subtle, and experimentation is the best way to find the best setting.

Refer to: "SENSITIVITY (VELOCITY, AMPLITUDE & PITCH MODULATION," page 67.

LOW FREQUENCY OSCILLATOR MODULATION DEPTH, AMPLITUDE/PITCH/CUTOFF

JOB 19

● Amplitude Modulation Depth



Summary: Determines the amount of amplitude modulation applied to the selected element.

Settings: 0 ... 127

Procedure: If the Amplitude Modulation ("AMOD") parameter is not already selected, use the [◁] and [▷] cursor keys to select it. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the desired degree of amplitude modulation.

Details: A "0" setting produces no modulation while a setting of "127" produces maximum modulation. Amplitude modulation produces a periodic variation in the volume of the sound, thus creating a tremolo effect.

Please note that the amplitude modulation sensitivity parameter (see page 68) must also be set to an appropriate value before amplitude modulation can be applied.

Refer to: "Amplitude Modulation Sensitivity" on page 68.

● Pitch Modulation Depth

Summary: Determines the amount of pitch modulation applied to the selected element.

Settings: 0 ... 127

Procedure: Use the [◁] and [▷] cursor keys to select the Pitch Modulation ("PMOD") parameter. Use the [DATA ENTRY] control or [+1/YES] and [-1/NO] keys, or numeric and [ENTER] keys to set the desired degree of pitch modulation.

Details: A "0" setting produces no modulation while a setting of "127" produces maximum modulation. Pitch modulation produces a periodic pitch variation, thereby creating a vibrato effect.

Please note that the pitch modulation sensitivity parameter (see page 68) must also be set to an appropriate value before pitch modulation can be applied.

Refer to: "Pitch Modulation Sensitivity" on page 68.

● Filter Cutoff Modulation Depth

Summary: Determines the amount of modulation applied to the cutoff frequency of the filter of the selected element.

Settings: 0 ... 127

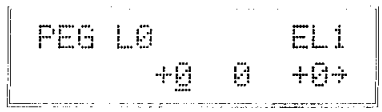
Procedure: Use the [◁] and [▷] cursor keys to select the Filter Cutoff Modulation ("CutofMOD") parameter. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the desired degree of cutoff modulation.

Details: A "0" setting produces no modulation while a setting of "127" produces maximum modulation. Filter cutoff modulation produces wah-wah type effects.

Please note that the filter cutoff modulation sensitivity parameter (see page 78) must also be set to an appropriate value before cutoff frequency modulation can be applied.

Refer to: Tutorial, page 37. "FILTER: RESONANCE/VELOCITY SENSITIVITY/MODULATION SENSITIVITY" on page 77.

PITCH ENVELOPE GENERATOR (PEG) LEVEL/RATE JOB 20



Summary: All parameters within this function determine the "shape" of the pitch envelope generator for the selected element.

Settings:
L0, L1, L2, L3, and RL parameters: –64 ... +63
R1, R2, R3 and RR parameters: 0 ... 63

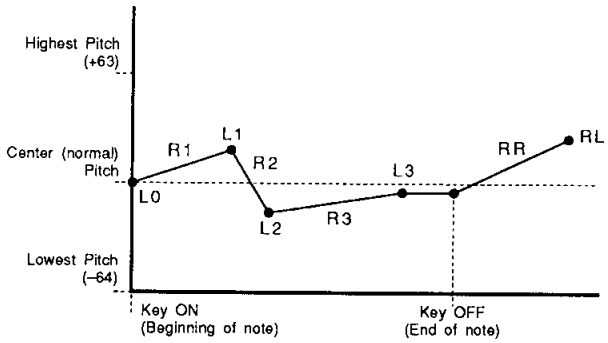
Procedure: Use the [◁] and [▷] cursor keys to select the various rate and level parameters in turn (L0, R1, L1, R2, L2, R3, L3, RR and RL), using the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the value of each.

The arrow symbols (+ and +) that appear at either end of the display mean that more parameters can be accessed by moving the cursor in the indicated direction using the [◁] and [▷] keys.

Details: Unlike the amplitude envelope generator, the "Level" parameters of which actually correspond to volume levels, the pitch envelope generator level parameters correspond to pitch. Plus "+" values produce higher pitch while minus "–" values produce lower pitch. "0" level values produce normal pitch.

The "Rate" parameters work in the same way as the amplitude envelope generator rate parameters: a setting of "0" produces the slowest rate between levels, while the maximum setting of "63" produces the fastest (almost instantaneous) change.

The pitch envelope begins at L0 (Level 0), moves to L1 (Level 1) at a rate determined by the setting of R1, then to L2 (Level 2) at R2 (Rate 2), and then to L3 (Level 3) at R3 (Rate 3). The pitch stays at L3 until the key is released, and then moves to RL (Release Level) at the rate determined by RR (Release Rate).



PITCH ENVELOPE GENERATOR SENSITIVITY, RANGE/RATE SCALING/VELOCITY SWITCH

JOB 21

● PEG Range

Summary: Sets the maximum range of pitch envelope generator pitch variation.

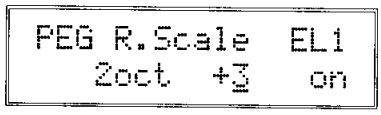
Settings: 2oct, 1oct, 1/2oct

Procedure: If the Range parameter is not already selected, use the [◁] and [▷] cursor keys to select it. Use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to select the desired range.

Details: This parameter determines the **total maximum** range of the pitch envelope generator, so a setting of "2oct" means that the maximum range is ±1 octave. That is, if a level parameter is set to +63, for example, the pitch at that point will be one octave above normal pitch.

Refer to: "PITCH ENVELOPE GENERATOR (PEG) LEVEL/RATE," page 71.

● PEG Rate Scaling



Summary: Allows the overall pitch envelope generator rate for the selected element to be varied across the entire pitch range.

Settings: –7 ... +7

Procedure: Use the [◁] and [▷] cursor keys to select the Rate Scaling ("R.Scale") parameter. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the desired degree of rate scaling.

Details: Plus ("+") settings produce a longer overall envelope time for the low notes and a shorter envelope time for the high notes. The maximum "+7" setting produces the greatest envelope length variation across the pitch range. Minus ("–") settings produce thle opposite effect — a shorter low-note envelope and longer high-note envelope. A setting of "+0" results in no envelope length variation.

Refer to: "PITCH ENVELOPE GENERATOR (PEG) LEVEL/RATE," page 71.

● PEG Velocity Switch

```
PEG Vel.SW    EL1
  2oct  +3    on
```

Summary: Determines whether overall envelope length of the pitch envelope generator for the selected element will or will not be controlled by velocity information.

Settings: on, off

Procedure: Use the [◁] and [▷] cursor keys to select the Velocity Switch ("Vel.SW") parameter. Use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to turn the velocity switch "on" or "off.".

Details: When this parameter is turned "on," higher velocity values produce a longer pitch envelope — i.e. the harder a key is played the longer the pitch variation. When "off" no envelope rate variation is produced.

Refer to: "PITCH ENVELOPE GENERATOR (PEG) LEVEL/RATE," page 71.

FILTER: TYPE/CUTOFF/MODE JOB 22

● Type

```
FL1\Type      EL1
  LPF   92  LFO
```

Summary: Determines the response of the selected filter.

Settings:
Filter 1 (FL1): THU, LPF, HPF
Filter 2 (FL2): THU, LPF

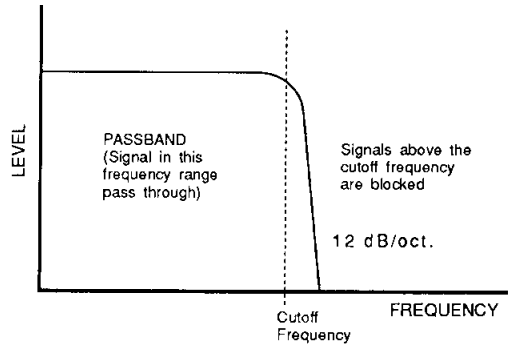
Procedure: If the Type parameter is not already selected, use the [◁] and [▷] cursor keys to select it. Use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to select the desired filter response.

Filter 1 or Filter 2 can be selected by holding the [SELECT] key and pressing the numeric [9] or [6] key, respectively.

Details: The "THU" (THROUGH) setting turns the filter OFF.

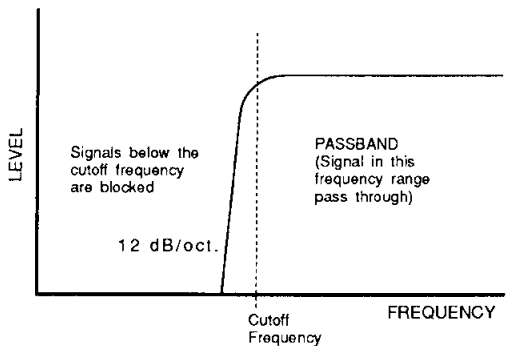
The "LPF" (Low Pass Filter) setting produces a filter response that allows only frequencies <u>below</u> the cutoff frequency (See "Cutoff" below) to pass.

LPF Filter Response



The "HPF" (High Pass Filter — available only on filter 1) setting produces a filter response that allows only frequencies <u>above</u> the cutoff frequency (See "Cutoff" below) to pass.

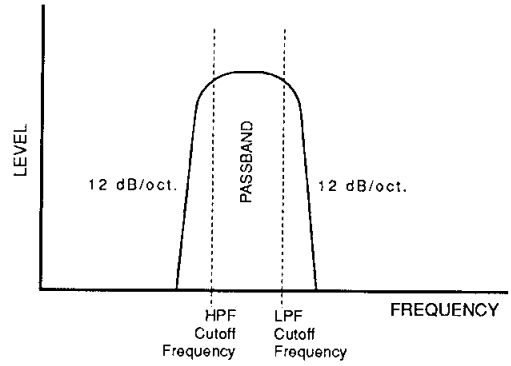
HPF Filter Response



By combine the HPF setting of filter 1 with the LPF setting of filter 2, it is possible to create a BPF (Band Pass Filter) response that allows only frequencies that fall between the cutoff of the HPF and LPF to pass. In this case the cutoff of the LPF must be set at a higher frequency than that of the HPF. It is also possible to set both filters to "LPF" and the same cutoff frequency, resulting in a steep 24-dB per octave filter slope.

Refer to: Tutorial, page 37, 45. "FILTER: CUTOFF ENVELOPE GENERATOR," page 75.

Bandpass Filter (HPF + LPF) Response



● Cutoff

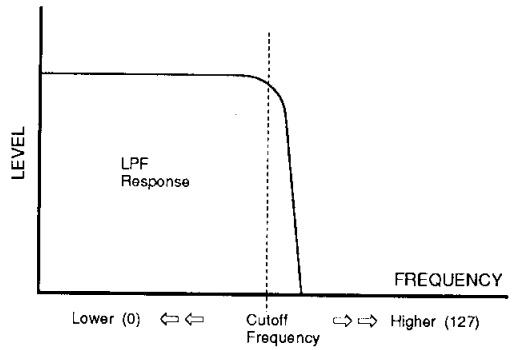
Summary: Sets the cutoff frequency of the selected filter.

Settings:
0 ... 127 (LPF)
0 ... 114 (HPF)

Procedure: Use the [◁] and [▷] cursor keys to select the Cutoff parameter. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to select the desired cutoff frequency.

Filter 1 or Filter 2 can be selected by holding the [SELECT] key and pressing the numeric [9] or [6] key, respectively.

Details: Lower cutoff values produce a lower cutoff frequency and higher values produce a higher cutoff frequency.



With an LPF response, a lower cutoff frequency reduces the range of high frequencies passed, making the sound "darker" or "rounder."

With a HPF response, a higher cutoff frequency reduces the range of low frequencies passed, making the sound "thinner" or "sharper."

Refer to: Tutorial, page 37, 45. "FILTER: CUTOFF ENVELOPE GENERATOR," page 75.

● Mode

Summary: Determines whether the cutoff frequency of the selected filter will be controlled by the LFO or by the filter envelope generator (EG).

Settings: EG, LFO, EGVA

Procedure: Use the [◁] and [▷] cursor keys to select the Mode parameter. Use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to select the "EG" or "LFO" setting.

Filter 1 or Filter 2 can be selected by holding the [SELECT] key and pressing the numeric [9] or [6] key, respectively.

Details: Varying the filter cutoff frequency can ceate "sweep" or "wah-wah" type effects. If the cutoff is controlled via the LFO a cyclic variation based on the "shape" of the selected LFO waveform is produced. If EG control is selected, the filter envelope generator (a separate EG is provided for each filter — see "FILTER: CUTOFF ENVELOPE GENERATOR" below) can be set up to produce a wide range of time-based variations.

Please note that if "LFO" is selected, the filter cutoff envelope generator parameters have no effect on the sound and will not appear on the display: Cutoff EG levels and rates, rate scaling, and level scaling. The filter can only be controlled from controllers (modulation wheel, etc.) if the LFO mode is selected.

If the "EGVA" setting is selected, the R1 and L1 envelope parameters are controlled by note velocity (i.e. the harder a key is played the higher the R1 speed and L1 level). All EG parameters are controlled by note velocity when "EG" is selected.

Refer to: Tutorial, page 37, 45. "FILTER: CUTOFF ENVELOPE GENERATOR," below.

FILTER: CUTOFF ENVELOPE GENERATOR JOB 23

Summary: All parameters within this function determine the "shape" of the cutoff envelope generator for the selected filter. This function is only available if the "Mode" parameter (page 63) is set to "EG" or "EGVA."

Settings:

L0, L1, L2, L3, L4, RL1 and RL2 parameters:
–64 ... +63

R1, R2, R3, R4, RR1 and RR2 parameters:
0 ... 63

Procedure: Use the [◁] and [▷] cursor keys to select the various rate and level parameters in turn (L0, R1, L1, R2, L2, R3, L3, R4, L4, RR1, RL1, RR and RL2), using the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the value of each.

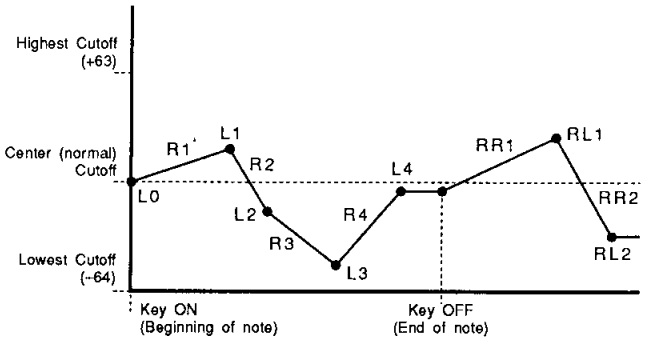
The arrow symbols (+ and +) that appear at either end of the display mean that more parameters can be accessed by moving the cursor in the indicated direction using the [◁] and [▷] keys.

The filter 1 or filter 2 envelope generator can be selected by holding the [SELECT] key and pressing the numeric [9] or [6] key, respectively.

Details: The cutoff envelope generator level parameters correspond to cutoff frequency. Plus "+" values produce higher cutoff frequencies while minus "–" values produce lower cutoff frequencies. "0" level values produce the normal cutoff frequency as determeined by the cutoff parameter (See "Cutoff" on page 74).

The "Rate" parameters work in the same way as the amplitude and pitch envelope generator rate parameters: a setting of "0" produces the slowest rate between levels, while the maximum setting of "63" produces the fastest (almost instantaneous) change.

The pitch envelope begins at L0 (Level 0), moves to L1 (Level 1) at a rate determined by the setting of R1, then to L2 (Level 2) at R2



(Rate 2), then to L3 (Level 3) at R3 (Rate 3), and then to L4 (Level 4) at R4 (Rate 4). The cutoff stays at L4 until the key is released, and then moves to RL1 (Release Level 1) at the rate determined by RR1 (Release Rate 1), and finally to RL2 (Release Level 2) at RR2 (Release Rate 2).

Refer to: Tutorial, page 37, 45. "FILTER: RATE SCALING," below. "FILTER: LEVEL SCALING BREAKPOINT," below. "FILTER: LEVEL SCALING OFFSET," page 77.

FILTER: RATE SCALING — JOB 24

```
FL1\R.Scale  EL1
             =+7
```

Summary: Allows the overall cutoff envelope generator rate for the selected filter to be varied across the entire pitch range (i.e. keyboard range). This function is only available if the "Mode" parameter (page 75) is set to "EG" or"EGVA."

Settings: –7 ... +7

Procedure: Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the desired degree of rate scaling.

The filter 1 or filter 2 envelope generator can be selected by holding the [SELECT] key and pressing the numeric [9] or [6] key, respectively.

Details: Plus ("+") settings produce a longer overall envelope time for the low notes and a shorter envelope time for the high notes. The maximum "+7" setting produces the greatest envelope length variation across the pitch range. Minus ("–") settings produce the opposite effect — a shorter low-note envelope and longer high-note envelope. A setting of "+0" results in no envelope length variation.

Refer to: "FILTER: CUTOFF ENVELOPE GENERATOR," page 75.

FILTER: LEVEL SCALING BREAKPOINT — JOB 25

```
FL1\LS BP1   EL1
  C1  G2  E4  C6
```

Summary: Allows four separate cutoff envelope generator level-scaling breakpoints to be set at any notes between C–2 and G8 for the selected filter.

Settings: C–2 ... G8

Procedure: Use the [◁] and [▷] cursor keys to select the desired breakpoint (BP1, BP2, BP3 and BP4, from left to right), then use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to set the breakpoint note.

The filter 1 or filter 2 envelope generator can be selected by holding the [SELECT] key and pressing the numeric [9] or [6] key, respectively.

The breakpoint can also be set by pressing the [ENTER] key — "KBD" will flash on the display — and then the key on the keyboard corresponding to the desired breakpoint.

Details: Level scale offset values are applied to each of the breakpoints using the LEVEL SCALE OFFSET function described below. Natural filter level variations can thereby be produced across the range of the controlling keyboard.

Refer to: "FILTER: LEVEL SCALING OFFSET" on page 77. "FILTER: CUTOFF ENVELOPE GENERATOR," page 75.

FILTER: LEVEL SCALING OFFSET — JOB 26

```
FL1\LS OFS1  EL1
  +0  +0  +0  +0
```

Summary: Sets the amount of level offset for each of the four level-scaling breakpoints set in the "FILTER: LEVEL SCALING BREAKPOINT" function described above.

Settings: –127 ... +127

Procedure: Use the [◁] and [▷] cursor keys to select the desired offset parameter (OFS1, OFS2, OFS3 and OFS4, from left to right), then use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the level-scaling offset for the corresponding breakpoint.

The filter 1 or filter 2 envelope generator can be selected by holding the [SELECT] key and pressing the numeric [9] or [6] key, respectively.

Details: Negative values reduce the level, and positive values increase the level at the corresponding breakpoint. No matter what value is chosen, the EG level will never exceed its maximum of 63.

When different offsets are set for adjacent breakpoints, the level varies accordingly and smoothly between the breakpoints.

Refer to: "FILTER: LEVEL SCALING BREAKPOINT" on page 76. "FILTER: CUTOFF ENVELOPE GENERATOR," page 75.

FILTER: RESONANCE/VELOCITY SENSITIVITY/ MODULATION SENSITIVITY — JOB 27

● Resonance

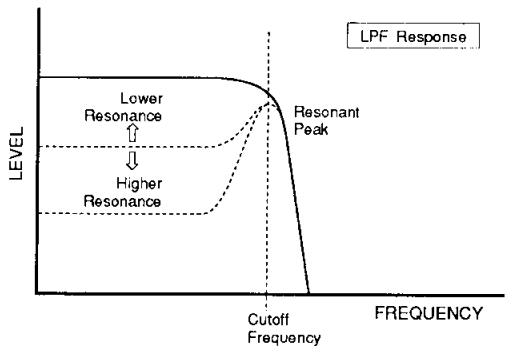
```
FL\Resonance EL1
     0  +6  +3
```

Summary: Determines the degree of resonance of filter 1 and filter 2.

Settings: 0 ... 99

Procedure: If the Resonance parameter is not already selected, use the [◁] and [▷] cursor keys to select it. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to select the desired degree of resonance.

Details: This parameter has a similar effect to the "resonance" settings on traditional analog synthesizer filters — i.e. it determines the height of a peak in the filter response at the cutoff frequency.



Higher resonance values produce a higher resonant peak and reduce the overall passband level.

Refer to: Tutorial, page 37, 45. "FILTER: TYPE/CUTOFF/MODE," page 73.

● Velocity Sensitivity

Summary: Determines how the filter 1 and filter 2 cutoff frequencies change in response to velocity changes (e.g. keyboard dynamics).

Settings: –7 ... +7

Procedure: Use the [◁] and [▷] cursor keys to select the Velocity Sensitivity ("Vel.Sens" on upper LCD line) paramcter. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to select the required degree of velocity sensitivity.

Details: Plus "+" settings produce higher cutoff frequencies in response to higher velocity values — i.e. the harder a key is played, the higher the cutoff frequency. The maximum setting of "+7" produces the maximum level variation in response to velocity changes. Minus "–" settings produce the opposite effect: lower cutoff in response to higher velocity. A setting of "+0" results in no cutoff variation.

Refer to: "FILTER: TYPE/CUTOFF/MODE," page 73.

● Modulation Sensitivity

Summary: Determines the sensitivity of the filter 1 and filter 2 cutoff frequency to modulation applied via the LFO and appropriate controllers.

Settings: –7 ... +7

Procedure: Use the [◁] and [▷] cursor keys to select the Modulation Sensitivity parameter ("Mod.Sens"). Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the required degree of modulation sensitivity.

Details:

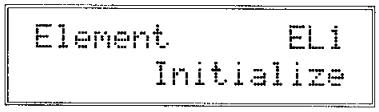
Plus "+" settings produce higher cutoff frequencies in response to modulation — i.e. the greater the modulation, the higher the cutoff frequency. The maximum setting of "+7" produces the maximum cutoff variation in response to modulation. Minus "–" settings produce the opposite effect: lower cutoff in response to modulation. A setting of "+0" results in no cutoff modulation.

When setting up the low-frequency oscillator or a controller to apply cutoff modulation, this parameter must be set to a value **other than** "0" for pitch modulation to take place.

Refer to: "LOW FREQUENCY OSCILLATOR (LFO) WAVEFORM/SPEED/DELAY/PHASE" on page 69. "LOW FREQUENCY OSCILLATOR MODULATION DEPTH, AMPLITUDE/PITCH/CUTOFF" on page 70. "CONTROLLER" functions from page 81 to page 84.

ELEMENT INITIALIZE

JOB 28



Summary: Initializes all parameters of the active element.

Settings: None

Procedure: After selecting the "ELEMENT Initialize" display, press the [ENTER] key. "Sure?" will appear on the upper 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 Element Initialize is executed, the element parameters are initialized to the following values:

The element initialize function is useful if you want to begin programming an element "from scratch."

Refer to: "VOICE INITIALIZE," page 90.

Jobs	Initialized Values			
AWM wave selection	P46 (Tri)			
Volume	127			
Note shift	+0			
Detune	+0			
Low note limit	C–2			
High note limit	G8			
Low velocity limit	1			
High velocity limit	127			
Panning	+0			
Effect balance	0			
Oscillator mode/note/tune	Mode norm	Note —	Tune +0	
AEG mode/level/rate	Mode nrm	R1 63	R2 63	L2 63
	R3 63	L3 63	R4 0	RR 63
AEG rate scaling	+0			
AEG level scale breakpoint	BP1 C1	BP2 G2	BP3 E4	BP4 C6
AEG level scale offset	OFS1 +0	OFS2 +0	OFS3 +0	OFS4 +0
Sensitivity	Velocity +0	V. rate off	AMS +0	PMS 3
LFO waveform/speed/delay/phase	Wave tri	Speed 65	Delay 0	Phase 0
LFO modulation depth, amplitude/ pitch/cutoff	AMOD 0	PMOD 0	CutoffMOD 0	

Jobs	Initialized Values			
PEG level/rate	L0 +0	R1 63	L1 +0	
	R2 63	L2 +0	R3 63	L3 +0
	RR 63	RL +0		
PEG sensitivity, range/rate scaling/ velocity	Range 2oct	R. scale +0	Vel. SW off	
Filter: type/cutoff/mode	Type THU	Cutoff 127	Mode LFO	
Filter: cutoff envelope generator	L0 +0	R1 0	L1 +0	
	R2 0	L2 +0	R3 0	L3 +0
	R4 0	L4 +0	RR1 0	RL1 +0
	RR2 0	RL2 +0		
Filter: rate scaling	+0			
Filter: level scaling breakpoint	BP1 C1	BP2 G2	BP3 E4	BP4 C6
Filter: level scaling offset	OFS1 +0	OFS2 +0	OFS3 +0	OFS4 +0
Filter: resonance/velocity sensitivity/ modulation sensitivity	Resonance 0	Vel. sens +0	Mod.sens +0	

CONTROLLER: PITCH BEND RANGE — JOB 29

Summary: Sets the maximum pitch bend range.

Settings: 0 ... 12

Procedure: Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the required 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.

If the MIDI controller used is a keyboard, pitch bend is normally controlled via its pitch bend wheel.

CONTROLLER: AFTER TOUCH PITCH BIAS — JOB 30

Summary: Sets the maximum pitch variation range achievable via after-touch control.

Settings: –12 ... +12

Procedure: Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the required after touch pitch bias range.

Details: Each increment represents a semitone. A setting of "0" produces no pitch variation. A setting of "+12" allows a maximum pitch variation of one octave up, while a setting of "–12" allows a maximum pitch variation of one octave down corresponding to after-touch key pressure.

CONTROLLER: RANDOM PITCH RANGE — JOB 31

Summary: Sets the amount of random pitch variation produced each time a note is played.

Settings: 0 ... 7

Procedure: Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the required random pitch range.

Details: When this function is set to a value other than "0," the pitch changes randomly each time a note is played. The random pitch change is applied independently to each note in a chord. A setting of "7" produces the greatest amount of random pitch change.

This function is ideal for simulating the sound of instruments like the clavichord, string sections or other ensembles in which the pitch of each note is rarely in perfect tune with the others.

CONTROLLER: AMPLITUDE MODULATION — JOB 32

Summary: Assigns a controller to, and sets the maximum depth of amplitude modulation applied by the LFO.

Settings:
CTL# (Control Number) Parameter: 0 ... 120, AT
RNG (Range) Parameter: 0 ... 127

Procedure: Use the [◁] and [▷] keys to select the "CTL#" or "RNG" parameter, then use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the selected parameter as required.

Details: The "CTL#" parameter corresponds to MIDI control numbers. Standard controller assignments are noted in the upper right-hand corner of the display:

Set the CTL# parameter to the number of the controller with which you intend to control this function.

The RNG parameter can be set to a value between 0 and 127. A setting of "0" produces no change when the assigned controller is operated, while a setting of "127" produces the maximum possible change.

If you assign a breath controller (CTL# 2) to amplitude modulation, for example, the harder you blow into the breath controller, the greater will be the depth of the amplitude modulation produced. Please note that the amplitude modulation sensitivity parameter described on page ?? must be set to an appropriate value before amplitude modulation will function.

Refer to: "SENSITIVITY (VELOCITY, AMPLITUDE & PITCH MODULATION)," page 67.

CONTROLLER: PITCH MODULATION — JOB 33

Summary: Assigns a controller to, and sets the maximum depth of pitch modulation applied by the LFO.

Settings:
CTL# (Control Number) Parameter: 0 ... 120, AT
RNG (Range) Parameter: 0 ... 127

Procedure: Use the [◁] and [▷] keys to select the "CTL#" or "RNG" parameter, then use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the selected parameter as required.

Details: The "CTL#" parameter corresponds to MIDI control numbers. Standard controller assignments are noted in abbreviations shown in the upper right-hand corner of the display:

Set the CTL# parameter to the number of the controller with which you intend to control this function.

The RNG parameter can be set to a value between 0 and 127. A setting of "0" produces no change when the assigned controller is operated, while a setting of "127" produces the maximum possible change.

If you assign the modulation wheel (CTL# 1) to pitch modulation, for example, rolling the modulation wheel away from you will produce deeper pitch modulation. Please note that the pitch modulation sensitivity parameter described on page ?? must be set to an appropriate value before pitch modulation will function.

Refer to: "SENSITIVITY (VELOCITY, AMPLITUDE & PITCH MODULATION)," page 67.

CONTROLLER: CUTOFF MODULATION JOB 34

Summary: Assigns a controller to, and sets the maximum depth of filter cutoff modulation applied by the LFO.

Settings:
CTL# (Control Number) Parameter: 0 ... 120, AT
RNG (Range) Parameter: 0 ... 127

Procedure: Use the [◁] and [▷] keys to select the "CTL#" or "RNG" parameter, then use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the selected parameter as required.

Details: The "CTL#" parameter corresponds to MIDI control numbers. Standard controller assignments are noted in the upper right-hand corner of the display:

Set the CTL# parameter to the number of the controller with which you intend to control this function.

The RNG parameter can be set to a value between 0 and 127. A setting of "0" produces no change when the assigned controller is operated, while a setting of "127" produces the maximum possible change.

If you assign a foot controller (CTL# 4) to cutoff modulation, for example, pressing forward on the foot controller pedal increases the depth of the cutoff modulation. Please note that the cutoff modulation sensitivity parameter described on page 77 must be set to an appropriate value before cutoff modulation will function.

Refer to: "FILTER: RESONANCE/VELOCITY SENSITIVITY/MODULATION SENSITIVITY," page 77.

CONTROLLER: CUTOFF FREQUENCY CONTROL JOB 35

Summary: Assigns a controller to, and sets the range of cutoff frequency control.

Settings:
CTL# (Control Number) Parameter: 0 ... 120, AT
RNG (Range) Parameter: 0 ... 127

Procedure: Use the [◁] and [▷] keys to select the "CTL#" or "RNG" parameter, then use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the selected parameter as required.

Details: The "CTL#" parameter corresponds to MIDI control numbers. Standard controller assignments are noted in the upper right-hand corner of the display:

Set the CTL# parameter to the number of the controller with which you intend to control this function.

The RNG parameter can be set to a value between 0 and 127. A setting of "0" produces no change when the assigned controller is operated, while a setting of "127" produces the maximum possible change.

If you assign a [DATA ENTRY] controller (CTL# 6) to cutoff frequency control, for example, higher [DATA ENTRY] controller settings will result in higher cutoff frequencies. You could assign a foot controller to cutoff frequency control to create wah-wah pedal type effects.

Refer to: "FILTER: RESONANCE/VELOCITY SENSITIVITY/MODULATION SENSITIVITY," page 77.

CONTROLLER: EG BIAS CONTROL — JOB 36

Summary: Assigns a controller to, and sets the range of envelope generator bias control.

Settings:

CTL# (Control Number) Parameter: 0 ... 120, AT

RNG (Range) Parameter: 0 ... 127

Procedure: Use the [◁] and [▷] keys to select the "CTL#" or "RNG" parameter, then use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the selected parameter as required.

Details: The "CTL#" parameter corresponds to MIDI control numbers. Standard controller assignments are noted in the upper right-hand corner of the display:

Set the CTL# parameter to the number of the controller with which you intend to control this function.

The RNG parameter can be set to a value between 0 and 127: A setting of "0" produces no change when the assigned controller is operated, while a setting of "127" produces the maximum possible change.

If you assign a [DATA ENTRY] controller (CTL# 6) to EG bias control, for example, higher [DATA ENTRY] controller settings will result in higher EG levels. You could assign a breath controller to EG bias control to create tonguing and breath effects.

Refer to: "AMPLITUDE ENVELOPE GENERATOR (AEG) MODE/LEVEL/RATE," page 64.

CONTROLLER: VOLUME CONTROL — JOB 37

Summary: Assigns a controller to, and sets the range of volume control.

Settings:

CTL# (Control Number) Parameter: 0 ... 120, AT

MIN (Minimum) Parameter: 0 ... 127

Procedure: Use the [◁] and [▷] keys to select the "CTL#" or "MIN" parameter, then use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the selected parameter as required.

Details:

The "CTL#" parameter corresponds to MIDI control numbers. Standard controller assignments are noted in the upper right-hand corner of the display:

Set the CTL# parameter to the number of the controller with which you intend to control this function.

The MIN parameter determines the minimum volume level that can be set using the assigned controller.

Normally the volume control (CTL# 7) will be assigned to this function, but you could assign a foot controller (CTL# 4) instead to allow foot-controlled swells and other expressive dynamics.

EFFECT: TYPE/OUTPUT LEVEL JOB 38

● Type

Summary: Selects one of 34 digital effects for the current voice.

Settings:

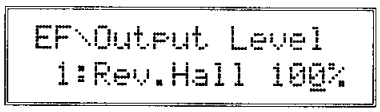
1:	Rev.Hall	(Reverb Hall)
2:	Rev.Room	(Reverb Room)
3:	RevPlate	(Reverb Plate)
4:	RevChrch	(Reverb Church)
5:	Rev.Club	(Reverb Club)
6:	RevStage	(Reverb Stage)
7:	BathRoom	(Reverb Bath Room)
8:	RevMetal	(Reverb Metal)
9:	Delay	(Single Delay)
10:	DelayL/R	(Stereo Delay)
11:	St.Echo	(Stereo Echo)
12:	Doubler1	(Single Doubler)
13:	Doubler2	(Stereo Doubler)
14:	PingPong	(Ping Pong Delay)
15:	Pan Ref.	(Pan Reflections)
16:	EarlyRef	(Early Reflections)
17:	Gate Rev	(Gate Reverb)
18:	Rvs Gate	(Reverse Gate)
19:	FB E/R	(Feedback Early Reflections)
20:	FB Gate	(Feedback Gate)
21:	FB Rvs	(Feedback Reverse)
22:	Dly1&Rev	(Delay 1 & Reverb)
23:	Dly2&Rev	(Delay 2 & Reverb)
24:	Tunnel	(Tunnel Reverb)
25:	Tone 1	(Tone Control 1)
26:	Dly1&T1	(Delay 1 & Tone Control 1)
27:	Dly2&T1	(Delay 2 & Tone Control 1)
28:	Tone 2	(Tone Control 2)
29:	Dly1&T2	(Delay 1 & Tone Control 2)
30:	Dly2&T2	(Delay 2 & Tone Control 2)
31:	Dist&Rev	(Distortion & Reverb)
32:	Dst&Dly1	(Distortion & Delay 1)
33:	Dst&Dly2	(Distortion & Delay 2)
34:	Dist.	(Distortion)

Procedure: If the Type parameter is not already selected, use the [◁] and [▷] cursor keys to select it. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to select the desired effect.

Details: Each effect has three different editable parameters that allow the effect to be "customized" to suit you individual needs.

Refer to: "EFFECT: EFFECT PARAMETERS," page 86. Utility mode "EFFECT," page 133.

● Output Level



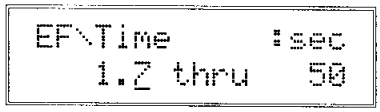
Summary: Sets the level of the selected effect in relation to the direct (no effect) sound.

Settings: 0% ... 100%

Procedure: Use the [◁] and [▷] cursor keys to select the Output Level parameter. Use the [DATA ENTRY] control, [-1/NO] and [+1/YES] keys, or numeric and [ENTER] keys to set the desired output level.

Details: A setting of "0%" results in no effect, leaving only the "dry" sound of the voice. The maximum setting of "100%" applies the maximum amount of effect.

Refer to: Tutorial, page 25.



Summary: Accesses the individual programmable parameters for the selected effect.

Settings: The parameters and settings for each type of effect are different. See "Details" below.

Procedure: Use the [◁] and [▷] keys to select the desired parameter, then use the [DATA ENTRY] control or [+1/YES] and [–1/NO] keys to set its value.

Details: Brief descriptions of the parameters provided for each effect type are provided below:

1 ... 8: Reverb Effects

- Time: 0.3 ... 10 seconds
  Sets the amount of time it takes for the reverb sound to decay to an inaudible level.
- LPF: 1.25 ... 12 kHz, Thru
  Rolls off (attenuates) the high-frequency content of the reverb signal above the selected frequency. The LPF is OFF when set to THRU.
- Delay: 0.1 ... 50 milliseconds
  Sets the delay time before the reverb sound begins.

9: Delay

- Time: 0.1 ... 300 milliseconds
  Sets the delay time.
- FB Delay: 0.1 ... 300 milliseconds
  Determines the amount of time before feedback is applied, and therefore the length of the initial delay before subsequent repeats begin.
- FB Gain: 0% ... 99%
  Determines the amount of feedback returned to the input of the effect processor. Higher values produce a greater number of repeats.

10: Delay L/R

- Lch Delay: 0.1 ... 300 milliseconds
  Sets the delay time of the left channel.
- Rch Delay: 0.1 ... 300 milliseconds
  Sets the delay time of the right channel.
- FB Gain: 0% ... 99%
  Determines the amount of feedback returned to the input of the effect processor. Higher values produce a greater number of repeats.

11: Stereo Echo

- Lch Delay: 0.1 ... 152 milliseconds
  Sets the delay time of the left channel.
- Rch Delay: 0.1 ... 152 milliseconds
  Sets the delay time of the right channel.
- FB Gain: 0% ... 99%
  Determines the amount of feedback returned to the input of the effect processor. Higher values produce a greater number of repeats.

12: Doubler 1

- Delay: 0.1 ... 50 miliseconds
  Sets the doubling delay.
- HPF: Thru, 160 ... 1000 Hertz
  Rolls off (attenuates) the low-frequency content of the signal above the set frequency. The HPF is OFF when set to THRU.
- LPF: 1.25 ... 12 kilohertz, Thru
  Rolls off (attenuates) the high-frequency content of the signal above the set frequency. The LPF is OFF when set to THRU.

13: Doubler 2

- Lch Delay: 0.1 ... 50 milliseconds
  Sets the delay time of the left channel.
- Rch Delay: 0.1 ... 50 milliseconds
  Sets the delay time of the right channel.
- LPF: 1.25 ... 12 kilohertz, Thru
  Rolls off (attenuates) the high-frequency content of the signal above the set frequency. The LPF is OFF when set to THRU.

14: Ping Pong Delay

- Time: 0.1 ... 152 miliseconds
  Sets the delay time.
- Pre-delay: 0.1 ... 152 milliseconds
  Sets an initial delay time before the subsequent repeats begin.
- FB Gain: 0% ... 99%
  Determines the amount of feedback returned to the input of the effect processor. Higher values produce a greater number of repeats.

15: Panned Reflections

- Room Size: 0.5 ... 3.2
  Sets the separation between reflections. Higher values produce greater separation between reflections, and therefore the effect of a bigger room.
- FB Gain: 0% ... 99%
  Determines the amount of feedback returned to the input of the effect processor. Higher values produce a greater number of reflections.
- Direction: L → R, R → L
  Determines the direction of the pan sweep.

16: Early Reflections
17: Gate Reverb
18: Reverse Gate

- Room Size: 0.5 ... 3.2
  Sets the separation between reflections. Higher values produce greater separation between reflections, and therefore the effect of a bigger room.
- LPF: 1.25 ... 12 kilohertz, Thru
  Rolls off (attenuates) the high-frequency content of the signal above the set frequency. The LPF is OFF when set to THRU.
- Delay: 0.1 ... 50 milliseconds
  Sets the delay time before the early reflection sound begins.

19: Feedback Early Reflections
20: Feedback Gate
21: Feedback Reverse Gate

- Room Size: 0.5 ... 3.2
  Sets the separation between reflections. Higher values produce greater separation between reflections, and therefore the effect of a bigger room.
- LPF: 1.25 ... 12 kilohertz, Thru
  Rolls off (attenuates) the high-frequency content of the signal above the set frequency. The LPF is OFF when set to THRU.
- FB Gain: 0% ... 99%
  Determines the amount of feedback returned to the input of the effect processor. Higher values produce a greater number of rereflections.

22: Delay 1 & Reverb
24: Tunnel

- Time: 0.3 ... 10 seconds
  Sets the amount of time it takes for the reverb sound to decay to an inaudible level.
- Delay: 0.1 ... 152 milliseconds
  Sets the delay time.
- FB Gain: 0% ... 99%
  Determines the amount of feedback returned to the input of the effect processor. Higher values produce a a greater number of delay repeats.

23: Delay 2 & Reverb

- Time: 0.3 ... 10 seconds
  Sets the amount of time it takes for the reverb sound to decay to an inaudible level.
- Lch Delay: 0.1 ... 152 milliseconds
  Sets the delay of the left channel.
- Rch Delay: 0.1 ... 152 milliseconds
  Sets the delay of the right channel.

25: Tone Controls

- Low: –12 ... +12 dB
  Sets the amount of boost or cut applied to the low frequencies. A setting of "0" produces no boost or cut. Minus values produce cut and plus values produce boost.
- Mid: –12 ... +12 dB
  Sets the amount of boost or cut applied to mid-band frequencies. A setting of "0" produces no boost or cut. Minus values produce cut and plus values produce boost.
- High: –12 ... +12 dB
  Sets the amount of boost or cut applied to the high frequencies. A setting of "0" produces no boost or cut. Minus values produce cut and plus values produce boost.

26: Delay 1 & Tone 1
27: Delay 2 & Tone 1
29: Delay 1 & Tone 2
30: Delay 2 & Tone 2

- Brilliance: 0 ... 12
  Determines the brilliance of the sound. Higher values produces a more brilliant, "sharper" sound.
- Delay: 0.1 ... 300 milliseconds
  Sets the delay time.

• FB Gain: 0% ... 99%
Determines the amount of feedback returned to the input of the effect processor. Higher values produce a greater number of repeats.

28: Tone Controls 2

• HPF: Thru, 160 ... 1000 Hz
Rolls off (attenuates) the low-frequency content of the signal above the set frequency. The HPF is OFF when set to THRU.

• Mid: –12 ... +12 dB
Sets the amount of boost or cut applied to mid-band frequencies. A setting of "0" produces no boost or cut. Minus values produce cut and plus values produce boost.

• LPF: 1.25 ... 12.0 kilohertz, Thru
Rolls off (attenuates) the high-frequency content of the signal above the set frequency. The LPF is OFF when set to THRU.

31: Distortion & Reverb

• Time: 0.3 ... 10 seconds
Sets the amount of time it takes for the reverb sound to decay to an inaudible level.

• Depth: 0% ... 100%
Sets the degree of distortion produced. Higher values produce more distortion.

• Balance: 0% ... 100%
Sets the amount of reverb in relation to distortion. A setting of "0" produces distortion only, while a setting of "100" produces distortion plus maximum reverb. "50" produces an approximately even balance between the distortion and reverb sound.

32: Distortion & Delay 1
33: Distortion & Delay 2

• Time: 0.1 ... 300 milliseconds
Sets the delay time.

• FB Gain: 0% ... 99%
Determines the amount of feedback returned to the input of the effect processor. Higher values produce a greater number of repeats.

• Depth: 0% ... 100%
Sets the degree of distortion produced. Higher values produce more distortion.

34: Distortion

• Level: 0% ... 100%
Sets the degree of distortion produced. Higher values produce more distortion.

• HPF: Thru, 160 ... 1000 Hz
Rolls off (attenuates) the low-frequency content of the signal above the set frequency. The HPF is OFF when set to THRU.

• LPF: 1.25 ... 12.0 kilohertz, Thru
Rolls off (attenuates) the high-frequency content of the signal above the set frequency. The LPF is OFF when set to THRU.

Refer to: "EFFECT: TYPE/OUTPUT LEVEL," page 85. Utility mode "EFFECT," page 133.

VOICE NAME JOB 40

Summary: Assigns a name of up to 10 characters to the current voice.

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

[Space] ! " # $ % & ' ( ) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [¥] ^ _ `
a b c d e f g h i j k l m n o p q r s t u v w x y z { | } ← →

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

Details: It's a good ideas to give your voices names that make the voice easily identifiable. If you've created a new voice that combines piano and organ waves, for example, you could call it something like "PianOrgan".

Refer to: Tutorial, page 46.

VOICE RECALL JOB 41

Summary: Recalls the last voice edited from the SY55 edit buffer.

Settings: None

Procedure: After selecting the "VOICE Edit Recall" display, press the [ENTER] key. "Sure?" will appear on the upper line of the display. Press the [+1/YES] to initialize or [–1/NO] to cancel the initialize operation.

"Completed!" will appear briefly when the recall operation is finished.

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

Please note, however, that a compare operation overwrites the recall buffer with the contents of the edit buffer at that time. A recall operation following a compare operation will therefore recall the contents of the edit buffer at the time of the compare operation.

Refer to: Tutorial, page 47.

VOICE INITIALIZE

JOB 42

Summary: Initializes all parameters of the current voice.

Settings: None.

Procedure: After selecting the "VOICE Initialize" display, press the [ENTER] key. "Sure?" will appear on the upper 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:

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

Refer to: Tutorial, page 42. "ELEMENT INITIALIZE," page 79.

Jobs	Initialized Values			
Voice mode	1 element			
AWM wave selection	P46 (Tri)			
Total volume	127			
Note shift	+0			
Detune	+0			
Low note limit	C–2			
High note limit	G8			
Low velocity limit	1			
High velocity limit	127			
Panning	+0			
Effect balance	0			
Oscillator mode/note/tune	Mode norm	Note —	Tune +0	
AEG mode/level/rate	Mode nrm	R1 63	R2 63	L2 63
	R3 63	L3 63	R4 0	RR 63
AEG rate scaling	+0			
AEG level scale breakpoint	BP1 C1	BP2 G2	BP3 E4	BP4 C6
AEG level scale offset	OFS1 +0	OFS2 +0	OFS3 +0	OFS4 +0
Sensitivity	Velocity +0	V. rate off	AMS +0	PMS 3
LFO waveform/speed/delay/phase	Wave tri	Speed 65	Delay 0	Phase 0
LFO modulation depth, amplitude/ pitch/cutoff	AMOD 0	PMOD 0	CutoffMOD 0	

Jobs	Initialized Values			
PEG level/rate	L0 +0	R1 63	L1 +0	
	R2 63	L2 +0	R3 63	L3 +0
	RR 63	RL +0		
PEG sensitivity, range/rate scaling/ velocity	Range 2oct	R. scale +0	Vel. SW off	
Filter: type/cutoff/mode	Type THU	Cutoff 127	Mode LFO	
Filter: cutoff envelope generator	L0 +0	R1 0	L1 +0	
	R2 0	L2 +0	R3 0	L3 +0
	R4 0	L4 +0	RR1 0	RL1 +0
	RR2 0	RL2 +0		
Filter: rate scaling	+0			
Filter: level scaling breakpoint	BP1 C1	BP2 G2	BP3 E4	BP4 C6
Filter: level scaling offset	OFS1 +0	OFS2 +0	OFS3 +0	OFS4 +0
Filter: resonance/velocity sensitivity/ modulation sensitivity	Resonance 0	Vel. sens +0	Mod.sens +0	
Controller: pitch bend range	2			
Controller: after touch pitch bias	+0			
Controller: random pitch range	0			
Controller: amplitude modulation	CTL# 12	RNG 64		
Controller: pitch modulation	CTL# 1	RNG 64		
Controller: cutoff modulation	CTL# 1	RNG 0		
Controller: cutoff frequency control	CTL# 12	RNG 0		
Controller: EG bias control	CTL# 2	RNG 0		
Controller: volume control	CTL# 14	MIN 0		
Effect: type/output level	Type 1	Output level 100%		
Effect: time/LPF/delay	Time 2.6 sec	LPF 8.0 kHz	Delay 29 ms	
Voice name	INIT VOICE			