KURZWEIL™
Music Systems

Programming Reference
1000 Series Synthesizers

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FCC Notice:

This device generates, uses and can radiate radio frequency energy. If not installed according to the instructions in this manual, it may cause interference to radio communications. This device has been tested and found to comply with limits for Class A computing devices pursuant to Part 15, Subpart J of FCC Regulations. These regulations are designed to provide reasonable protection against radio interference by devices used in commercial environments. Operation in residential areas is likely to cause interference, in which case the user will be required to take whatever measures are necessary to correct the interference.

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Section I
INTRODUCTION

1.1 About This Manual

This manual has been designed to provide you with all of the information you will need to program your new 1000 Series instrument.

Section I introduces basic programming concepts and software features of the 1000 Series. This information is essential to understanding the following sections.

Section II covers the Master Menu and its submenus. The Parameters of these menus affect all Programs, and determine general playing characteristics of the instrument.

Section III presents the Program Menu, whose Parameters affect Programs individually.

Section IV covers the Layer Menu. The Parameters of this Menu separately determine the characteristics of each Layer in a Program.

Section V presents editing of Modular Effects, which represent the digital equivalent of a traditional modular synthesizer. The Parameters of the Modular Effects Menus provide very fine control of a Program's sonic character.

Section VI contains programming examples that are designed to demonstrate practical applications of the 1000 Series Edit Menus.

Section VII is a quick-reference guide for use in programming 1000 Series instruments. Charts and illustrations from both this manual and the *Musician's Guide* are reproduced together here, so that you can find them quickly and easily. This Section also contains supplementary information that is not covered elsewhere in the 1000 Series documentation.

Section VIII, the Appendix, provides information on Value resolutions in the 1000 Series and describes self-diagnostic routines for the K1000 Keyboard and 1000 Series Expanders. These routines can be very helpful if you suspect a malfunction in your instrument.

The Kurzweil 1000 Series *Musician's Guide* contains important basic information about your new instrument. If you have not already done so, please take time to familiarize yourself with that manual before proceeding through this *Programming Reference*.

1.2 1000 Series Objects

At many points in this manual, you will see references to Objects.

"Object" is a generic term which refers to programming features of 1000 Series instruments: items which can be named, saved, deleted, defined or programmed are termed Objects. Programs, Velocity Maps and Intonation Tables, for example, are Objects. So are the Effects Modules that are discussed in Section VI of this manual.

Having already studied your *Musician's Guide*, you are familiar by now with the procedures for naming, saving and deleting Programs. Similar procedures apply in the case of some other Objects: Velocity Maps (programmed features that define how the 1000 responds to MIDI Velocity data), MIDI Program Maps (which determine both the transmission and reception of MIDI Program Change data), and Intonation Tables (which permit special tuning systems such as Just Intonation) are all treated in the same way.

In addition to using the programming features of your

1000 Series instrument, you can also manipulate Objects with ObjectMover™, an application developed by Kurzweil for popular personal computers. More than just a simple patch librarian program, ObjectMover enables you to move 1000 Series Objects between two or more 1000's, and to program your 1000 from your computer screen. It also enables you to save Objects to disk in Library files.

ObjectMover is available for the Macintosh computer (512K RAM or more) and the Atari ST (520 or 1040). An IBM-compatible version is currently under development.

1.3 The Editing Menu System

As described in Section IV of your *Musician's Guide*, 1000 Series Parameters are grouped into Menus for convenient and efficient editing.

The first Parameter of each Menu is the name, or heading, of that Menu. All Menu heading numbers end in "0." Values are not assignable to Menu headings, so no Value or unit of measurement appears in the lower line of the display when a heading is shown. You can usually select the Menu heading or the first programming Parameter in a Menu with one or more dual presses of the PARAMETER buttons.

The complement of Menus available for editing varies depending upon the current Effects Edit Level of the current Layer. When Compiled Effects are selected, for example, the Menus associated solely with Modular Effects editing will not appear in the display. Similarly, when Modular Effects are selected, Menu number 300 (the Effects Menu, which contains Compiled Effects Parameters) cannot be accessed.

Figure 1-1 summarizes the Edit Mode Menus that are available for each Effects Edit Level.

000	MASTER
100	PROGRAM
200	LAYER
300	EFFECTS (Compiled Effects only)
700	Amp ENV (Amplitude Envelope 1)
900	ENV Ctl (Envelope Control)

(a) Compiled Effects Selected

000	MASTER
100	PROGRAM
200	LAYER
410	LFO1 (Local Low Frequency Oscillator 1)
420	LFO2
430	gLFO1 (Global LFO1)
440	gLFO2
510	ASR1 (Local Attack-Sustain-Release Envelope 1)
520	ASR2
530	gASR1 (Global ASR1)
540	gASR2
600	MXR (Mixer)
650	INV/NEG (Inverters and Negators)
700	Amp ENV (Amplitude Envelope 1)
800	ENV2 (Envelope 2)
900	ENV Ctl (Envelope Control)
920	Pitch Ctl (Pitch Control)
940	Amplitude Ctl (Amplitude Control)

(b) Modular Effects Selected

Figure 1-1 The Edit Mode Menus

1.4 About Control Sources

As you work through this *Programming Reference*, you will often see "Control Source List" given as the Value for a Parameter. The 1000 Series enables you to use a large number of internal and external Control Sources to modify dynamically the Values of Parameters and the functions of Effects Modules.

Mod wheels, footswitches and breath controllers are examples of Control Sources. MIDI data from a master keyboard, such as afterpressure, attack velocity and so on, also are Control Sources. The complete 1000 Series Control Source List is shown in Figures 1-2a and 1-2b (pages 4 and 5).

The assignment of Control Sources is the most powerful and important programming tool in the 1000 Series software. Notice that the Control Source List is very extensive. The 1000 Series has been designed to offer maximum versatility and flexibility in programming. A wide variety of sonic and musical functions is easily achieved simply by navigating through the Edit Menus and systematically assigning Control Sources to various Parameters.

Naturally, some Control Sources will be logical choices for certain Parameters, but not for others. In general, Control Sources appear in the display as possible Values for a Parameter only if they can actually be used to control that Parameter.

1.4.1 Control Source Configuration

Control Source data are expressed within the 1000 Series as a number between -1 and +1. The *configuration* of a Control Source determines how its output signal varies within that range. A given Control Source may have a unipolar, bipolar, or logical configuration.

Unipolar Control Sources generate signals ranging from 0 to +1.

Bipolar Control Sources generate signals between -1 and +1.

Logical Control Sources are Unipolar Sources whose signal values are limited to 0 and +1, with no intermediate values.

For example, the Sustain Pedal is a Logical Control Source: it generates +1 when the pedal is pressed down, and 0 when it is released.

A slider (such as the Volume or Data Entry slider on the K1000 Keyboard) is Unipolar: it generates 0 at minimum, +1 at maximum, and +0.5 at its midpoint. The K1000's Mod Wheel Control Source is also Unipolar, generating 0 when the wheel is at center and +1 at either extreme. Many of the 1000's Effects Modules are Bipolar. The Low Frequency Oscillators, for instance, generate waveshapes which vary between -1 and +1 (LFO's also can be made unipolar; see Section 6.2).

1.4.2 Control Source Type

The 1000 Series provides two *types* of Control Sources: local and global.

Global Control Sources affect every note that is generated by a given Program, with all notes receiving the same control signal. The MIDI Pitch Wheel is an example of a Global Control: if you hold two notes and move the Pitch Wheel, both notes will be bent equally at the same time and in the same direction.

Local Control Sources affect each note individually. Even when played at the same time, multiple notes each receive their own Local Control signals. MIDI polyphonic afterpressure is an example of a Local Control Source.

1.4.3 Descriptions of Control Sources

Please refer to Figure 1-2, the Control Source List, throughout this discussion.

None — Indicates that no Control Source has been assigned to the currently selected Parameter. When you create

Name	Display	Config	Type
Off	OFF	Logical	Global
On	ON	Logical	Global
None	None	—	—
Modulation Wheel (MIDI 01)	M Wheel	Unipolar	Global
Breath Controller (MIDI 02)	Breath		
MIDI 03	MIDI 03		
Foot Switch (MIDI 04)	Foot		
Portamento Time (MIDI 05)	PortTim		
Data Entry (MIDI 06)	Data		
Volume (MIDI 07)	Volume		
Balance (MIDI 08)	Balance		
MIDI 09	MIDI 09		
Stereo Pan (MIDI 10)	Pan		
Expression (MIDI 11)	Express		
MIDI 12	MIDI 12		
MIDI 13	MIDI 13		
MIDI 14	MIDI 14		
MIDI 15	MIDI 15		
Performance Control A (MIDI 16)	Ctl A		
Performance Control B (MIDI 17)	Ctl B		
Performance Control C (MIDI 18)	Ctl C		
Performance Control D (MIDI 19)	Ctl D		
MIDI 20	MIDI 20		
MIDI 21	MIDI 21		
MIDI 22	MIDI 22		
MIDI 23	MIDI 23		
MIDI 24	MIDI 24		
MIDI 25	MIDI 25		
MIDI 26	MIDI 26		
MIDI 27	MIDI 27		
MIDI 28	MIDI 28		
MIDI 29	MIDI 29		
MIDI 30	MIDI 30		
MIDI 31	MIDI 31		
Sustain Pedal (MIDI 64)	Sustain		
Portamento Switch (MIDI 65)	Port Sw		
Sostenuto Pedal (MIDI 66)	Sost Pd		
Soft Pedal (MIDI 67)	Soft Pd		
MIDI 68	MIDI 68		
Freeze Pedal (MIDI 69)	Frez Pd		
MIDI 70	MIDI 70		
MIDI 71	MIDI 71		
MIDI 72	MIDI 72		
MIDI 73	MIDI 73		
MIDI 74	MIDI 74		
MIDI 75	MIDI 75		
MIDI 76	MIDI 76		
MIDI 77	MIDI 77		

Figure 1-2(a) 1000 Series Control Source List

new Effects Modules, they usually default to this Value, which is equivalent to Off.

OFF — This is a constant Control Source value of 0. It is usually used to turn something off, or to hold a Parameter at its minimum value.

ON — This is a constant Control Source value of +1. It may be used to turn something on, or to hold a Parameter at its maximum value.

MIDI 01–31 & 64–95 — Many MIDI Controls (often called Destination Numbers) are standardized for certain functions by the MIDI 1.0 Specification that manufacturers use as a guideline for their MIDI implementation. MIDI 07, for example, is normally associated with Volume.

Unlike most synthesizers, which ordinarily feature preprogrammed MIDI destination assignments that cannot be changed, the 1000 Series offers full flexibility in its MIDI implementation. Parameters requiring Control Sources can be assigned to be controlled by almost any MIDI Destination Number from 1–31 or 64–95. Destinations 1–31 are intended for use with continuous controllers like Volume. Destinations 64–95 are for use with switch controllers like a Sustain pedal.

Destinations 33–63 are reserved for use as the LSB (Least Significant Byte) for destinations 1–31, respectively. This allows greater resolution in the 1000's processing of control signals.

The Reference Section (Section VII) of this manual includes a list of the Destination Numbers whose functions are standardized by the MIDI 1.0 Specification. Refer to the documentation of your other MIDI devices for information regarding their MIDI implementation.

Pitch Wheel — The Pitch Wheel Control Source generates -1 when the MIDI controller's Pitch Wheel is at one extreme, and +1 at the other. The polarity (+ or -) of the value relative to the wheel's position (up or down) depends on the setting of the Bend Range Parameter (number 224, in the Layer Menu) for each Layer of the Program.

Monophonic Pressure — If you want one of your 1000's Parameters to be controlled by the Monophonic (channel) afterpressure from your MIDI controller, assign this Control Source to that Parameter.

Polyphonic Pressure — Allows you to apply afterpressure signals on an individual basis to single notes (providing that your MIDI controller will transmit this data).

Name	Display	Config	Type
MIDI 78	MIDI 78	Unipolar	Global
MIDI 79	MIDI 79		
Performance Control E (MIDI 80)	Ctl E		
Performance Control F (MIDI 81)	Ctl F		
Performance Control G (MIDI 82)	Ctl G		
Performance Control H (MIDI 83)	Ctl H		
MIDI 84	MIDI 84		
MIDI 85	MIDI 85		
MIDI 86	MIDI 86		
MIDI 87	MIDI 87		
MIDI 88	MIDI 88		
MIDI 89	MIDI 89		
MIDI 90	MIDI 90		
MIDI 91	MIDI 91		
MIDI 92	MIDI 92		
MIDI 93	MIDI 93		
MIDI 94	MIDI 94		
MIDI 95	MIDI 95		
Pitch Wheel	P Wheel	Bipolar	Global
Monophonic Afterpressure	M Press	Unipolar	Global
Poylphonic Afterpressure	P Press	Unipolar	Local
Attack Velocity	Att Vel	Unipolar	Local
Release Velocity	Rel Vel	Unipolar	Local
Note State	Note St	Logical	Local
Key State	Key St	Logical	Local
Key Number	Key Num	Unipolar	Local
Local LFO 1 Output	LFO1	Bipolar	Local
Local LFO2 Ouptut	LFO2	Bipolar	Local
Global LFO1 Output	gLFO1	Bipolar	Global
Global LFO2 Output	gLFO2	Bipolar	Global
Local ASR1 Output	ASR1	Unipolar	Local
Local ASR2 Output	ASR2	Unipolar	Local
Global ASR1 Output	gASR1	Unipolar	Global
Global ASR2 Output	gASR2	Unipolar	Global
Mixer 1 Output	MXR1	Bipolar	Local
Mixer 2 Output	MXR2		
Inverter 1 Output	INV1		
Inverter 2 Output	INV2		
Negator 1 Output	NEG1		
Negator 2 Output	NEG2		
Amplitude Envelope	Amp ENV	Unipolar	Local
Envelope 2	ENV2	Bipolar	Local
Velocity Trigger 1	VTrig1	Logical	Local
Velocity Trigger 2	VTrig2	Logical	Local
Inverted Attack Velocity	InvAVel	Unipolar	Local
Inverted Release Velocity	InvRVel	Unipolar	Local
Playback Rate	PB Rate	Unipolar	Local

Figure 1-2(b) 1000 Series Control Source List

Attack Velocity — This Control Source causes a Parameter or Module to be controlled by the MIDI Attack Velocity of a given note.

The value generated by this Source depends not only on how hard you strike your MIDI controller's (or K1000's) keys, but also on which Velocity Map you have selected in the Master Menu. Values tend toward +1 with hard strikes, and toward 0 with soft strikes. A MIDI Attack Velocity signal is sent with each Note On message, and is translated into a dynamic level through the Master Velocity Map.

The table of Figure 1-3 shows the relationship between the force of your keystrikes and the approximate value generated by this Control Source.

Keystrike Dynamic	Attack Velocity
fff	1.0
ff	0.9
f	0.8
mf	0.6
mp	0.4
p	0.2
pp	0.1
ppp	0.05

Figure 1-3 Approximate Attack Velocity Values

Release Velocity — The MIDI Release Velocity signal is transmitted with each Note Off message, and is processed similarly to the Attack Velocity signal. The value of this Control Source will be 0 until a Note Off message is received.

Note State — This logical Control Source is directly related to the on/off state of the current note. It will be +1 (On) as long as the key that triggered the note is pressed or the note is sustained by the sustain, sostenuto, or freeze pedal functions. The value will be 0 (Off) if the key is released with no sustaining functions activated, or when the sustaining function is released.

Key State — This Source is similar to Note State, but is related only to the actual key that triggers a given note. When the key is pressed, it will generate a value of +1 (On); when the key is released, it will generate a value of 0 (Off) *regardless of whether a sustain function has been activated.*

Key Number — This Source's value is 0 when the lowest key of the related Layer is played, and +1 when the highest key of the Layer is played. Values for keys in between are interpolated linearly between 0 and +1. For example, if the low note of a Layer is C4 (middle C) and the high note is C8, then playing middle C will cause the Key Number Control Source to generate a value of 0; C8 will generate +1; and C6 will generate +0.5 (See Section IV, Parameters 209–211).

Inverse Attack Velocity — This is an inverted version of Attack Velocity, meaning that the value of this Control Source is equal to +1 minus the value of Attack Velocity.

Inverse Release Velocity — Similar to Inverse Attack Velocity, the value of this Source is equal to +1 minus the value of Release Velocity.

Playback Rate — This is a complicated Control Source that depends on the playback rate of the root sample associated with the currently-played note.

A 1000 Series Soundfile is actually a collection of several root samples, and transpositions of each of them, distributed in regions across the keyboard. Each root has a different playback rate, as does each of the notes associated with that root.

This Control Source generates a signal approaching zero as the playback rate of the current note nears the minimum for its region, and approaching +1 as the playback rate nears maximum. Seemingly random variations between 0 and +1 can be attained using this Source.

Effects Modules — This group of Control Sources (LFOs, ASRs, Mixers, Inverters and Negators) consists of Kurzweil 1000 programming Modules. All are explained in Section V.

1.5 Reading The Next Sections

Sections II through V of this manual are devoted to explaining the functions of all of the Parameters in each of the Edit Mode Menus. These Sections are organized somewhat like a dictionary, with the Parameters of each Menu treated in strict numerical order.

At the beginning of each Menu Section, you will see a flowchart that summarizes the Parameters within that Menu and their relationships to one another. The chart also indicates which Parameters you can jump to with a dual press of the PARAMETER buttons. (In the text, these Parameters are numbered in outline type.) Refer to the flowchart when you are reading through the Section.

In the text, each individual Parameter description is headed as shown in Figure 1-4 (we have used Parameter number 208 as an example).

The Parameter number is followed by the full name of the Parameter. The name actually is often abbreviated in the display; for instance, the name of Parameter 208 appears as "Kbd Tilt."

The black "bullet" item gives the range of possible Values for the Parameter — in this case, ±48 dB. If the Parameter can take several distinct Values, they are listed sequentially as they will appear in the display with repeated presses of the VALUE UP button.

The white bullet item tells you how the Parameter is affected by a dual press of the VALUE buttons (here, a dual press moves to the next highest multiple of 6 dB). When a dual press of the VALUE buttons is not recognized, the white bullet item is omitted.

As you can see, the material has been organized to make it as easy as possible for you to find the information that you need when programming your 1000 Series instrument. We recommend, however, that you read through all of the text once, in order to gain familiarity with the programming principles of the instrument's software and the range of capabilities at your command.

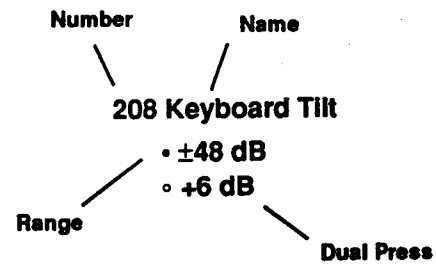


Figure 1-4 Format for Parameter Headings

Section II
Master Menu

The Master Menu governs the entire 1000: every Layer of every Program is affected by the Values assigned to its Parameters.

The Master Menu is always available, even if you have selected Program 000. Values for all Master Parameters are preserved when you turn off your 1000.

000 Master

This is the Menu heading.

001 Basic MIDI Channel

- **1–16**

Selects the basic MIDI channel for the 1000. The Basic Channel cannot be disabled, and disabled channels cannot be selected as the Basic Channel.

In Omni On Mode (Omni Mode in the K1000), the Basic Channel is the only channel that can receive MIDI mode change messages. In Omni Off Mode (Poly Mode in the K1000), the Basic Channel is the only channel that can receive Channel messages of any kind. In the K1000, MIDI data are transmitted on the Basic Channel.

002 Master Tune

- **±100 ct**
- **+10 ct**

Tunes the entire instrument up or down as much as one semitone, in steps of one cent (1/100th of a semitone). A Value of 0 tunes the instrument to A4 = 440 Hz.

Master Tune is used to match the pitch of the 1000 to that of another instrument or to a non-standard tuning.

003 Master Transpose

- **±60 ST**
- **+12 ST**

Transposes the pitch of the 1000 as much as five octaves (±60 ST) up or down, in steps of one semitone (ST). One octave contains 12 ST.

Master Transposition lets you play in one key on your MIDI controller and hear your music in another key from the 1000.

004 Velocity Map

- **Hardest**
  Harder
  Hard
  Medium
  Easy
  Easier
  Easiest
  K1000 Hard
  K1000 Medium
  K1000 Easy
  DX7 Hard
  DX7 Medium
  DX7 Easy

Velocity Maps determine the relationship between the keystrike velocity and the dynamics (loudness) of the sound produced by the 1000. Different Velocity Maps allow you to customize the dynamic response of the 1000 to different MIDI controllers and playing styles.

The preprogrammed Velocity Maps listed above are supplied in ROM. They are defined to work effectively with various MIDI controllers, as reflected in the names of some of the Maps.

Velocity Maps also may be edited, renamed and saved in non-volatile RAM, to be selected and used with different MIDI controllers or playing styles. See Parameters 005 and 1200 through 1212 (Section 2.3) for more information.

K1000 Owners — This Parameter has different Values for the K1000 Keyboard. See Section 2.1.

005 Edit Velocity Map

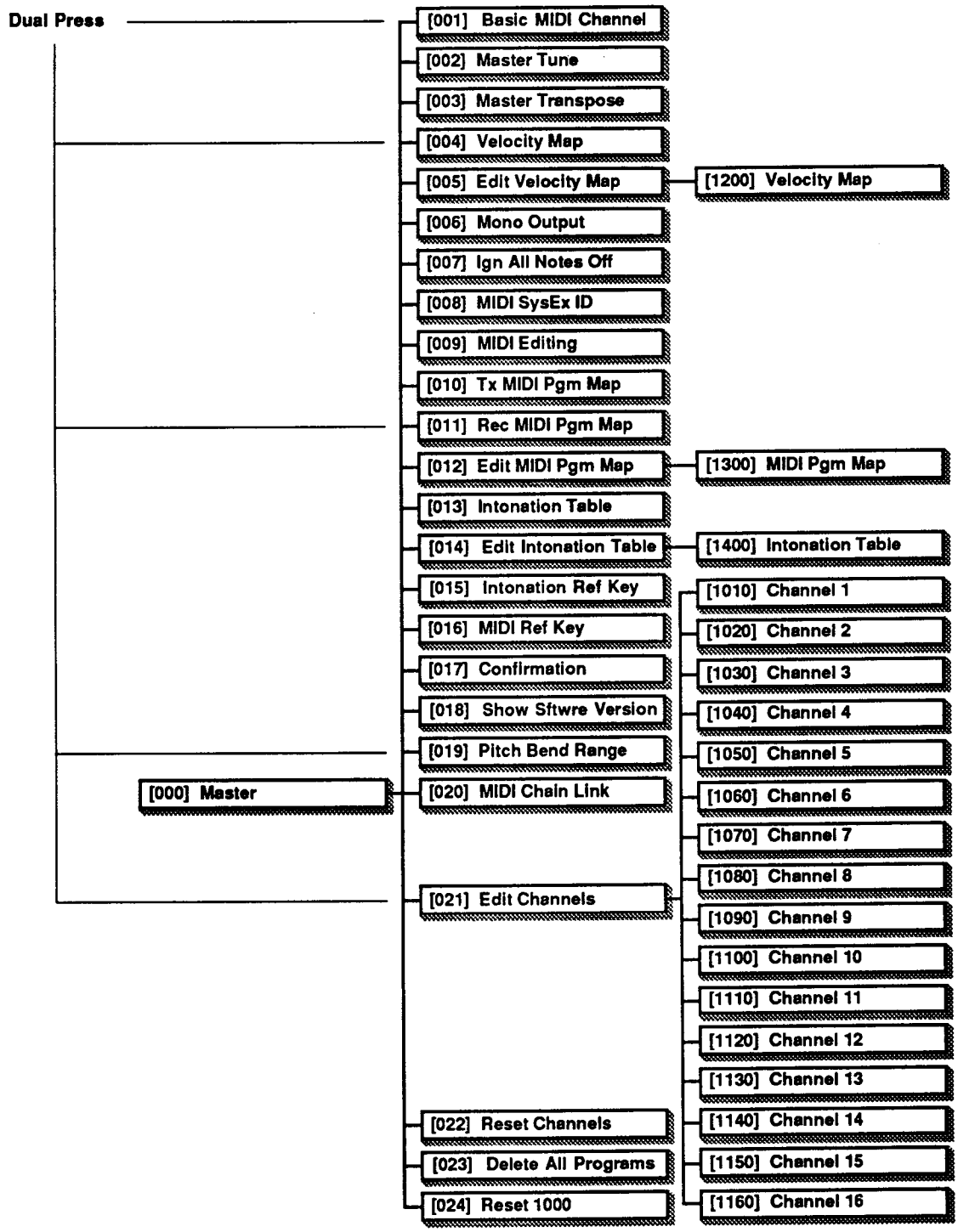
- **Yes**

Pressing YES at this Parameter will take you to the Velocity Map Submenu (See Section 2.3). You then will be able to edit the Velocity Map that you have selected with Parameter 004. (Be sure to select the Velocity Map you wish to edit before using Parameter 005.)

006 Mono Output

- **On**
  Off

Toggles between Mono and Stereo for the audio output.


Dual Press
[001] Basic MIDI Channel
[002] Master Tune
[003] Master Transpose
[004] Velocity Map
[005] Edit Velocity Map
[1200] Velocity Map
[006] Mono Output
[007] Ign All Notes Off
[008] MIDI SysEx ID
[009] MIDI Editing
[010] Tx MIDI Pgm Map
[011] Rec MIDI Pgm Map
[012] Edit MIDI Pgm Map
[1300] MIDI Pgm Map
[013] Intonation Table
[014] Edit Intonation Table
[1400] Intonation Table
[015] Intonation Ref Key
[016] MIDI Ref Key
[017] Confirmation
[018] Show Sftwre Version
[019] Pitch Bend Range
[000] Master
[020] MIDI Chain Link
[021] Edit Channels
[1010] Channel 1
[1020] Channel 2
[1030] Channel 3
[1040] Channel 4
[1050] Channel 5
[1060] Channel 6
[1070] Channel 7
[1080] Channel 8
[1090] Channel 9
[1100] Channel 10
[1110] Channel 11
[1120] Channel 12
[1130] Channel 13
[1140] Channel 14
[1150] Channel 15
[1160] Channel 16
[022] Reset Channels
[023] Delete All Programs
[024] Reset 1000

A Value of On sums the left and right channel signals so that the entire audio signal is present at both outputs, overriding all Layer and Channel Pan settings and creating the effect of Mono output for all Layers of all Programs. (Note that this does not *alter* the Pan settings; it simply ignores them.)

A Value of Off allows individual Layers to be panned in stereo. Signal levels at the left and right outputs will be determined by the Value assigned to Layer Menu Parameter 230 or the Channel Editing Parameters (see Section IV).

007 Ignore All Notes Off

- **Off**
  On

Enables the 1000 to respond to or ignore All Notes Off messages from your MIDI controller. This Parameter affects all MIDI channels.

Select a Value of On to ignore All Notes Off messages sent by your MIDI controller. This is an important feature, since some MIDI controllers send occasional All Notes Off messages even if you don't want them to.

Roland products, for example, send an All Notes Off signal whenever their MIDI data stream stops. If you are using a Roland product with your 1000, the 1000 probably will not sustain properly unless you set Parameter 007 to On.

Select a Value of Off if you want the 1000 to respond to All Notes Off messages. This will enable you to use any "Panic" or "All Notes Off" features that your MIDI controller may have: with a Value of Off, the 1000 will cancel all current notes whenever it receives an All Notes Off signal via MIDI.

008 MIDI System Exclusive ID

- **0 to 126**
- **+16**

Provides a MIDI code to identify the 1000 uniquely among various connected MIDI devices.

System Exclusive messages require a device identification code (in addition to the Manufacturer's code — Kurzweil's Manufacturer's Code is 07) in order to be able to address the correct MIDI device. This Parameter allows you to set the 1000's Sys Ex Device ID to any Value from 0 to 126. The 1000 will receive Sys Ex messages — regardless of MIDI Mode, Basic Channel, or currently selected Channel — when its Sys Ex ID is properly addressed.

009 MIDI Editing

- **On**
  Off

Allows you to enable or disable MIDI editing capability.

Selecting a Value of On instructs the 1000 to respond to certain incoming MIDI data as remote editing commands. Data received from the Non-registered Parameter Controls, the Data Entry Control, and the Increment/Decrement MIDI buttons on remote MIDI devices will be interpreted as editing commands.

With Parameter 009 set to Off, data from these controls will be ignored. On the K1000, this will deactivate the data slider for use with the K1000.

010 Transmit MIDI Program Map

- **Off**
  Direct
  Presets
  Empty

This Parameter gives you control over the Program Change information sent via the 1000's MIDI Out port.

Off disables the mapping function. No Program Change commands will be transmitted from the MIDI Out Port.

Direct leaves Program Change commands unaltered, so that the 1000 transmits a Program Change number identical to the one received from the MIDI controller (or from the K1000 front panel).

Presets automatically maps Program Change numbers 1–63

to Program numbers 001–063, and 64–128 to 128–192. Since MIDI cannot send Program Change numbers higher than 128, "Presets" gives you a convenient way to select each of the 1000's ROM Programs from your controller.

Empty is a Map with Program number 000 assigned to all 128 List Entries, serving as a template for you to create Maps of your own. You may create TxPMaps using Parameter 012.

More information on the use of MIDI Program Maps is given in the sidebar, *MIDI Program Maps.*

011 **Receive MIDI Program Map**

- **Off**
  Direct
  Presets
  Empty

Determines which Program the 1000 selects in response to Program Change commands from your MIDI controller.

Off disables the mapping function. Set RxPMap to Off, and the 1000 will not respond to MIDI Program Change commands.

Direct leaves Program Change commands unaltered, so the 1000 selects the Program whose number is identical to the Program Change number received from the MIDI controller.

MIDI Program Maps

MIDI controllers send Program Change commands only within the range of 0 to 127 (or 1 to 128). But some of the 1000's Programs are numbered beyond that range, so a method is needed to access those Programs from your MIDI controller. MIDI Program Maps provide the answer. With them, you can program the 1000 to receive a Program Change number of 001, for example, and play Program 168 instead.

Each MIDI Program Map provides 128 addresses (List Entries) numbered 1 to 128. Each location may hold a three-digit number from 1 to 255. When a Map (other than Off) is selected for Parameter 011 (Receive MIDI Program Map), the 1000 interprets an incoming MIDI Program Change command as a location in the Map. It then calls up the Program whose number is stored in that location. TxPMaps, similarly, function as look-up tables that control the transmission of Program Change commands from the 1000.

For example, imagine that you have created a MIDI Program Map called "Playlist.". Here are a few of the entries in this Map:

List 001 -> PRG 064
List 002 -> PRG 177
List 003 -> PRG 027

Use Parameters 010 and 011 to set both the Transmitted Program Map (TxPMap) and the Received Program Map (RxPMap) to Playlist.

When you select Program 001 from your MIDI controller, the 1000 will call up Program 064. When you select Program 002 from your MIDI controller, the 1000 will call up Program 177. If you select Program 177 from the 1000 front panel, the MIDI Out will transmit a Program Change Value of 002. *Note that the function of the TxPMap is the reverse of the RxPMap.*

The Program Maps are particularly useful when you are using your 1000 with another sound-generating keyboard. You might want to "fatten" your keyboard's string patch with Kurzweil strings, for example. To do so, simply set up a Map with the number of your keyboard's string patch as the List Entry and a 1000 string patch as the Program mapped to that Entry; then, name and save the Map.

When you select your new Map as the RxPMap, assigning the string patch on your keyboard will cause the 1000's string patch to be selected automatically (provided, of course, that the keyboard is transmitting Program Change commands).

Presets automatically maps Program Change numbers 1–63 to Program numbers 001–063, and 64–128 to 128–192. "Presets" is not an appropriate Value for TxPMap—as a rule, you will want to use Off, Direct, or a map you create yourself.

Empty is a Map with Program number 000 assigned to all 128 List Entries, serving as a template for you to create Maps of your own. You may create RxPMaps using Parameter 012.

K1000 Owners — This Parameter operates differently in the K1000 Keyboard. See Section 2.1.

012 Edit MIDI Program Map (RxPMap in display)

• Yes

Enables you to define your own MIDI Program Maps, assigning Program numbers to each of the 128 List Entries in each Map.

There is only one location in the 1000's memory for MIDI Program Maps, and both the TxPMap and RxPMap Parameters look to that location to call up Maps. Any preprogrammed or user-edited Map may be selected as the TxPMap, the RxPMap, or both.

When you answer YES to this Parameter, you will move to a Submenu of Parameters 1300 to 1304, which allow you to edit the currently selected Map (see Section 2.4).

013 Intonation Table

• Equal
Classic Just
Just w/b 7th
Harmonic
Just Harmonic
Werkmeister
1/5th Comma
1/4th Comma
Indian Raga
Arabic
Bali/Java1
Bali/Java2
Bali/Java3
Tibetan
CarlosAlpha
Pyth w/aug4
Pyth w/dim5

Selects from a list of temperament tables which define intervallic relationships within the octave.

Intonation tables are listed by name. The default Value is Equal temperament, which is the temperament used on a standard piano.

All of the Intonation Tables preserve octave relationships (all Cs, for example, are spaced one octave apart), but each Table has different tunings for the intervals between semitones. In the "Equal" Table, for example, the interval between each semitone is 100 cts.

014 Edit Intonation Table

• Yes

Enables you to edit the current Intonation Table (the one selected with Parameter 013).

The Intonation Table Editor allows you to specify the size of each of the twelve chromatic intervals in an octave, relative to the tonic (reference key). You select the Values for one octave, then the 1000 extrapolates those intervals to the remaining octaves in its range.

Pressing YES in response to this Parameter takes you to the Edit Intonation Table Submenu, Parameters 1400 to 1414 (see Section 2.5). Be sure you have used Parameter 013 to select the Intonation Table that you want to edit before you start making changes.

015 Intonation Reference Key

• C, C# . . . B

Establishes a reference key (by specifying the tonic note of that key) for whichever Intonation Table is selected using Parameter 013. The default Value is C.

The reference key determines which key you should play in to make the Intonation Table sound "correct." It is important because the 1000 cannot guess which key you'll be playing in. Consider this example: You have chosen an Intonation

Table which adjusts the minor 2nd (the interval between *do* and *di*) +100 ct, and have selected a Reference Key of C. This means that when you play any C# on your MIDI controller, you will actually hear a D from the 1000. If you play a piece of music suited to this intonation, it will sound fine *as long as you play in the key of C.*

If you modulate to the key of F, however, the piece will not sound the same, because the 1000 still "thinks" that C is *do*. If you change the Reference Key to F, then the interval between F and F# will be adjusted appropriately.

016 MIDI Reference Key

- **Off**
  On

Allows you to use MIDI data to select a reference key, as an alternative to using Parameter 015.

In a performance situation, you might not have time to change reference keys using Parameter 015. You can use Parameter 016 to rapidly change your reference key as frequently as you wish.

With a Value of Off, incoming MIDI data will have no effect on the selection of a reference key.

Select a Value of On, and you can change the reference key by sending a MIDI Note On signal for MIDI Note numbers 0 to 11 (C–1 to B–1). A Note On signal at C–1 sets the reference key to C; a Note On signal at C#–1 sets the reference key to C#, and so on. A standard 88-key MIDI controller has keys beginning at MIDI Note number 21 (A0), so you will need to transpose down two octaves on your MIDI controller to use this Parameter.

Note — As long as the Value for Parameter 016 is set On, a Note On signal in the range from C–1 to B–1 will not produce a sound on the 1000, but will only change the reference key.

017 Confirmation

- **On**
  Off

Allows you to remove the "Are you sure?" warnings that appear when you are at risk of losing, or significantly changing, data in the 1000's memory.

Once you have become an experienced 1000 programmer, you may find some of the warnings about losing data unnecessary. This Parameter enables you to dispense with all but the most crucial warnings (one warning related to resetting the 1000 will always remain). Simply select a Value of Off, and none of the "Are you sure?" warnings will appear.

018 Show Software Version

- **Yes**

Allows you to view the version of the 1000's operating software. Pressing NO at this Parameter will move you to Parameter 019.

019 Pitch Bend Range

- **Prog**
  ±6 QT

Enables you to set a uniform range for Pitch Bend for the entire 1000, overriding the Bend Range settings of each Layer.

A Value of "Prog" will deactivate this Parameter, causing all Pitch Bend Ranges to be defined according to the Values set in each Layer for Parameter 224 in the Layer Menu.

Values of -6 to +6 QT (Quartertones) will cause the Bend Range of all Layers to be set correspondingly. Values above 0 will cause the Pitch to bend upward when the Pitch Wheel is pushed upward, while Values below 0 will cause the Pitch to bend downward when the Pitch Wheel is pushed upward.

020 MIDI Chain Link

- **1/1 to 12/12**

Enables you to separately identify each of up to twelve 1000s chained together via MIDI.

Chain Link positions are displayed as fractions, with the denominator (the lower numeral) representing the total number of units in the chain, and the numerator (the upper numeral) representing a given unit's position in the chain.

For example, if you had six 1000s chained together, the first unit in the chain should have Parameter 020 set to a Value of 1/6, and the last unit in the chain should have Parameter 020 set to a Value of 6/6. Each 1000 would be responsible for two notes in each octave of the MIDI keyboard.

This procedure allows you to play up to twelve 1000s simultaneously from one MIDI controller without MIDI delays. It also allows you to effectively create a 288-note polyphonic unit consisting of twelve 1000s!

021 Edit Channels

• Yes

Enables you to set performance specifications based on MIDI channel assignments. When you answer Yes to this Parameter, you will move to a special list of Channel Editing Submenus for each MIDI channel (see Section 2.2).

The Channel Editing Submenu Parameters, when activated, will override all corresponding Layer assignments, enabling you to give identical performance characteristics to all Programs that are assigned to a particular MIDI channel. It also gives you flexibility in coordinating your 1000 with the rest of your MIDI system, without having to go into each Program and change its Values.

022 Reset Channels

• Yes

Enables you to clear all changes you have made with Parameter 021. If you answer YES to this Parameter, you will disable all of the Channel Parameters, returning control to the Layer Parameters of each Program.

023 Delete All Programs

• Yes

Deletes all user-defined (RAM-based) Programs from the 1000. Use this Parameter to clear the Program memory of your 1000 without affecting the Master settings.

When you answer Yes to this Parameter, the 1000 will give you two warnings (or one, if the Value of Parameter 017 is Off) before deleting your Programs.

024 Reset 1000

• Yes
No

Answering YES to this Parameter will delete all RAM-based Programs and all Master Menu Values, including MIDI Program Maps, Intonation Tables, and settings for Tuning and Transposition. It restores the 1000 to the condition in which you received it from the factory.

You probably will not want to reset your 1000 unless it seems hopelessly hung up, or if you are absolutely certain that you don't want to save any of your settings. If you really want to reset your 1000, however, press YES. The 1000 will give you as many as two additional opportunities to change your mind.

After your third response of YES, the display will disappear briefly, then reappear as it does when you power up. Only the factory settings will remain.

Keep in mind that at any time during the above sequence of responses, you may exit by pressing NO.

2.1 K1000 Master Parameters

In the K1000 Keyboard, there are two Master Parameters which differ from those in the 1000 Expanders: Parameters 004 (Velocity Map) and 011 (RxPMap).

The K1000 also incorporates several additional Master Parameters to accommodate the keyboard, wheels, sliders and pedals.

004 Velocity Map

- **Hard**
  Medium
  Easy

The K1000 has fewer Velocity Map Values than the rack-mount units. As with the 1000 Expanders, user-defined Velocity Maps may be created and stored in RAM.

011 Receive MIDI Program Map

- **Off**
  Direct
  Presets
  Empty
  Bins

The additional Value "Bins" is useful primarily when you are receiving Program Change commands from an external source, such as a sequencer. It is a special Program Map with thirty List Entries corresponding to the K1000's thirty Memory Bank locations. Program Change numbers from 1 to 30 will be mapped to whatever Programs are in Memory Bank locations A0 through C9 when "Bins" is selected.

If "Bins" is selected as the TxPMap (Parameter 010), then selecting Programs A0–C9 will send Program Change numbers of 1–30, respectively, from the K1000's MIDI Out.

025 Keyboard Control

- **On**
  Off

Enables you to deactivate/reactivate the K1000's keyboard.

A Value of Off deactivates the keyboard control over the K1000's sound engine, so that the K1000 will produce no sound when the keyboard is played. The K1000 still transmits all MIDI performance data, however. Use this setting when you want to use the K1000 as a MIDI master controller without hearing its sounds.

A Value of On reactivates the keyboard, returning the K1000 to normal operation.

026 Modulation Wheel Up

- **Control Source List**

The effects of deflecting the Mod (right-hand) Wheel up and down are independently programmable. This Parameter determines the effect of deflecting the wheel away from you.

027 Modulation Wheel Down

- **Control Source List**

This Parameter determines the effect of deflecting the wheel toward you.

028 Switch Pedal 1

- **Control Source List**

Determines the assignment of Pedal 1. The factory default is Sustain, but you may use the Control Source List to assign Pedal 1 to other functions.

029 Switch Pedal 2

- **Control Source List**

Determines the assignment of Pedal 2. The factory default is Sostenuto, but you may use the Control Source List to assign Pedal 2 to other functions.

030 Data Entry Slider

- **Control Source List**

Determines the assignment of the Data Entry Slider. The factory default is Data, but you may use the Control Source List to assign the Slider to other functions.

Section II

2.2 Channel Editing Submenus

When you Press YES in response to Parameter 021, you arrive at Parameter 1010, the first Parameter of the Channel 1 Submenu.

Each of these special Menus has an identical list of Parameters which allow you to set the performance specifications for each MIDI channel. Use either PARAMETER button to scroll through the list of Parameters for Channel 1, and either MENU button to select the Menu for another Channel.

1010 **Channel 1**

This is the Menu heading for the first Menu in the Channel editing Submenu.

1011 Volume Control

- **Off**
  On

Enables/disables MIDI control over Volume for all Programs assigned to MIDI Channel 1. The default Value is Off.

A Value of On enables MIDI Volume control, assuming that you have a function on your MIDI controller that is assigned to control Volume (MIDI destination number 7).

A Value of Off disables the Channel-based control over Volume. Volume control for Programs assigned to MIDI Channel 1 will then be defined by the setting for Layer Parameter 226 (Volume Control).

1012 Volume

- **±48 dB**
- **+6 dB**

Sets the volume (loudness) for all Programs assigned to MIDI Channel 1. When the Value of Parameter 1011 is set to On, the maximum volume of Programs assigned to Channel 1 will be set by the Value of this Parameter.

Keep in mind that this volume level is relative to the other channels. If maximum volume is reached, the other channels will be reduced in volume. Therefore it is better to adjust the Volume Parameter down, rather than up.

1013 Pan Override

- **Off**
  On

Enables you to determine Pan settings for all Programs assigned to MIDI Channel 1, overriding the Pan assignments in every Layer of those Programs. The default Value is Off.

A Value of On causes all Programs assigned to Channel 1 to use the Pan setting defined with Parameter 1014 (Pan).

A Value of Off leaves Pan settings as assigned for each Layer, according to the Values set for Layer Menu Parameter 230 (Stereo Pan).

1014 Pan

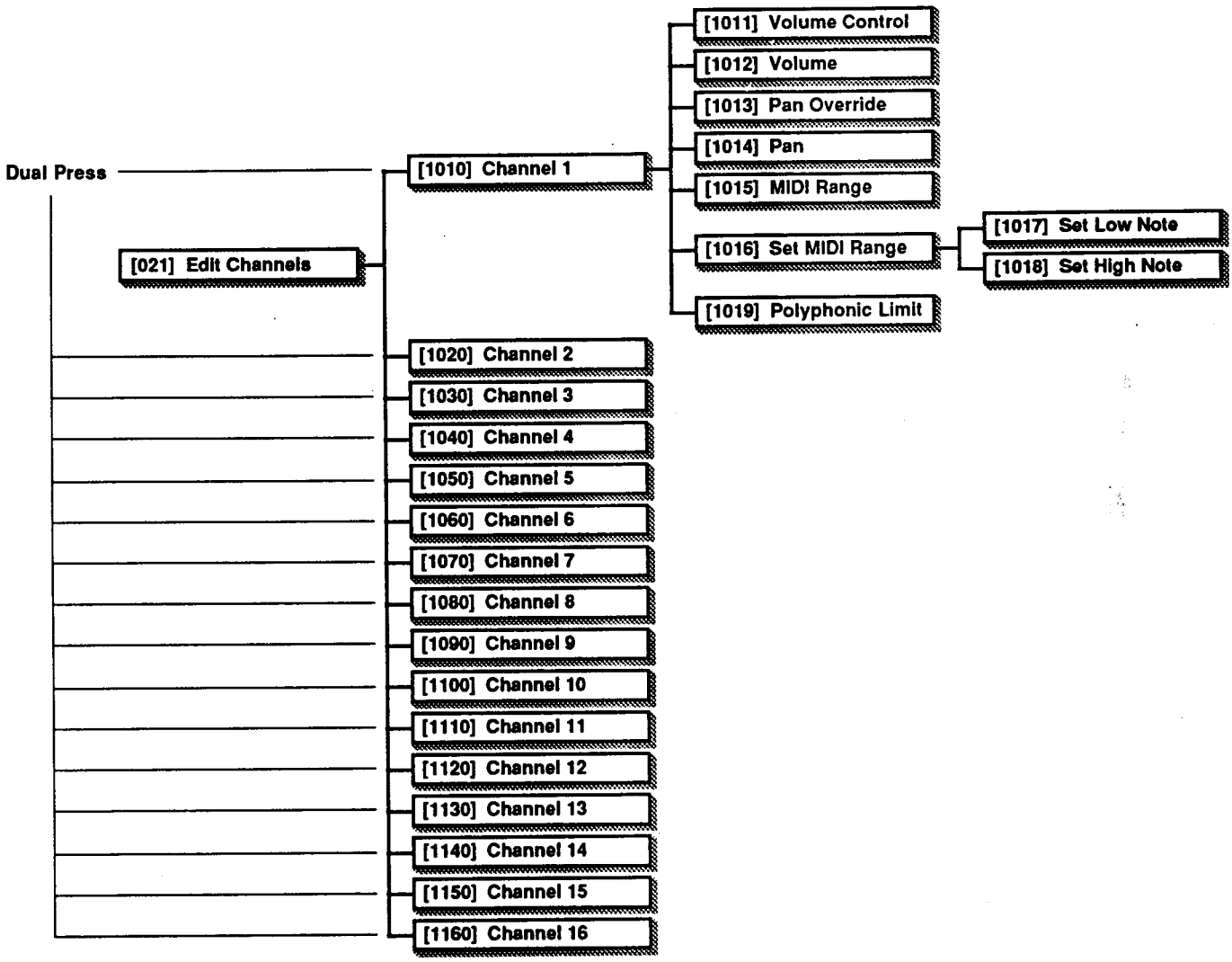
- **L to R**
  Auto
  Inv Auto

Enables you to define Channel Pan settings between the 1000's Left and Right Audio Outputs.

Use either VALUE button to change the Pan location. The display will show an asterisk (*) which indicates the position of the current Layer with respect to the Audio Outputs.

There are nine positions, including the extremes. A position in between will place the output of MIDI Channel 1 Programs at different levels at each Audio Output, with the center position providing an equal balance between Audio Outputs.

If you select a Value which exceeds either extreme, the display will change to show two additional Values — Auto Pan and Inv Auto Pan. These provide Pan settings which are a function of MIDI Note number.


Dual Press
[021] Edit Channels
[1010] Channel 1
[1011] Volume Control
[1012] Volume
[1013] Pan Override
[1014] Pan
[1015] MIDI Range
[1016] Set MIDI Range
[1017] Set Low Note
[1018] Set High Note
[1019] Polyphonic Limit
[1020] Channel 2
[1030] Channel 3
[1040] Channel 4
[1050] Channel 5
[1060] Channel 6
[1070] Channel 7
[1080] Channel 8
[1090] Channel 9
[1100] Channel 10
[1110] Channel 11
[1120] Channel 12
[1130] Channel 13
[1140] Channel 14
[1150] Channel 15
[1160] Channel 16

Select Auto Pan, and the lowest notes of the Program on MIDI Channel 1 will be directed to the Left Audio Output of the 1000. The highest notes will be directed to the Right Audio Output, with a progressive pan from left to right with each successively higher note.

Select Inv Auto Pan, and the Channel Pan function will be the reverse of the above (low notes to the right, and high to the left.)

1015 MIDI Range

- **Off**
  On

Activates/deactivates Channel-based assignment of Low Note and High Note settings. The default Value is Off.

With the Value set to On, all Programs assigned to MIDI Channel 1 will be limited to the keyboard range (region) defined by Parameters 1017 and 1018 (or via MIDI, using Parameter 1016) of this Menu.

With the Value set to Off, keyboard ranges will be determined for each Layer according to the Values for Layer Menu Parameters 210 and 211 (or via MIDI using Parameter 209).

1016 Set MIDI Range

- **Yes**

Allows you to use your MIDI controller to set the range that will be assigned to any Program on MIDI Channel 1 if the Value of Parameter 1015 is set to On.

When you answer Yes to this Parameter, the display will prompt you to strike a key on your MIDI controller. When you do, the display will ask you to strike another key, and then will return to the "Set MIDI Range?" display. This sets a keyboard range between (and including) the two keys that you struck.

Press NO at any time to abort and return to the "Set MIDI Range?" display.

1017 Set Low Note

- **C0 to C8**
  - **+ 1 octave (12 ST)**

Allows you to change the lowest key assignment of the keyboard range associated with Parameter 1015.

The Value displayed is an alphanumeric character representing the keys of a MIDI controller. The letter (A, B, C, etc.) refers to the notes of the chromatic scale. Black keys (e.g. C-sharp) are represented by a letter and the symbol "#." The numeral indicates the octave number.

Some examples: Middle C is represented as C4. The F-sharp above Middle C is represented as F#4. The highest C on a standard piano is C8. The lowest C on a standard piano is C1, and the octave number increases at each C. All keys below C1 are considered to be in Octave 0; the lowest A on a standard piano, for example, is A0.

Notice that you may set a range that goes below the normal range of a standard piano keyboard. The range may also exceed the normal range of a particular Soundfile. Nothing will be heard if you strike a controller key outside the range of the Soundfile.

1018 Set High Note

- **C0 to C8**
  - **+ 1 octave (12 ST)**

Allows you to change the highest key assignment of the keyboard range associated with Parameter 1015. Parameter 1018 operates in exactly the same fashion as Parameter 1017.

Notice that the Values you set for each of these Parameters

determine how the display wraps when you execute a dual press of the VALUE buttons. The available Values for Low Note will not exceed the Value set for High Note, and will wrap to C0 before reaching this limit. The available Values for High will not go below the Value set for Low Note, and will wrap from C8 to the Low Note Value.

1019 Polyphonic Limit

- **Off**
  1-20
  (1–24 for 1000 PX and K1000)
- **8**
  16
  24 (1000 PX and K1000)
  Off

Enables you to set the Polyphonic Limit of Programs on a MIDI Channel basis.

With the Value set to Off, polyphonic limits for each Program are determined according to the Values set for Program Menu Parameter 106 (Poly Limit).

At any Value from 1 to 20, all Programs assigned to MIDI Channel 1 will be limited to the number of simultaneous notes indicated by the Value you set.

1020 – 1029 Editing Menu for MIDI Channel 2
1030 – 1039 Editing Menu for MIDI Channel 3
1040 – 1049 Editing Menu for MIDI Channel 4
1050 – 1059 Editing Menu for MIDI Channel 5
1060 – 1069 Editing Menu for MIDI Channel 6
1070 – 1079 Editing Menu for MIDI Channel 7
1080 – 1089 Editing Menu for MIDI Channel 8
1090 – 1099 Editing Menu for MIDI Channel 9
1100 – 1109 Editing Menu for MIDI Channel 10
1110 – 1119 Editing Menu for MIDI Channel 11
1120 – 1129 Editing Menu for MIDI Channel 12
1130 – 1139 Editing Menu for MIDI Channel 13
1140 – 1149 Editing Menu for MIDI Channel 14
1150 – 1159 Editing Menu for MIDI Channel 15
1160 – 1169 Editing Menu for MIDI Channel 16

Each of the above Menus operates in the same fashion as the Menu for MIDI Channel 1.

2.3 Velocity Map Submenu

Parameters 1200 through 1212 are accessed by answering YES to Master Parameter 005 (Edit Velocity Map).

1200 Velocity Map

This is the heading for the Velocity Map Submenu.

1201 Set MIDI Velocity Map
• Yes

Enables you to set the softest (ppp) and the hardest (fff) keystrike Velocity number for the current Velocity Map, using the keys on your MIDI controller.

The 1000 will interpolate the Values for the remaining six Velocity numbers in the Map, creating a linear Map from the minimum and maximum Velocity numbers you set with your keystrikes.

Press Yes to activate the MIDI Velocity Map sequence. The display will prompt:

Strike key with
ppp dynamics

If you change your mind at this point, press NO to exit to the "Set MIDI VMap?" display, then press a PARAMETER button to select another Parameter. Otherwise, strike a key (or activate a note trigger) on your MIDI controller, using the force you wish to set as the *lowest* MIDI Velocity number for this Velocity Map. The display will then prompt:

Strike key with
fff dynamics

Again, you may abort with the NO button. Otherwise, striking another key on your MIDI controller will set the *highest* MIDI Velocity number for the current Map. When the 1000 has finished calculating the remaining six values, the display will return to Parameter 1201.

You may now use the PARAMETER buttons to view the eight dynamic levels and the Values assigned by the 1000, and edit them if you choose. You'll notice that whichever keystrike is lighter will be assigned as the "ppp dynamics" keystrike, even if it was the second keystrike (that given when the 1000's display prompted for the "fff dynamics" keystrike).

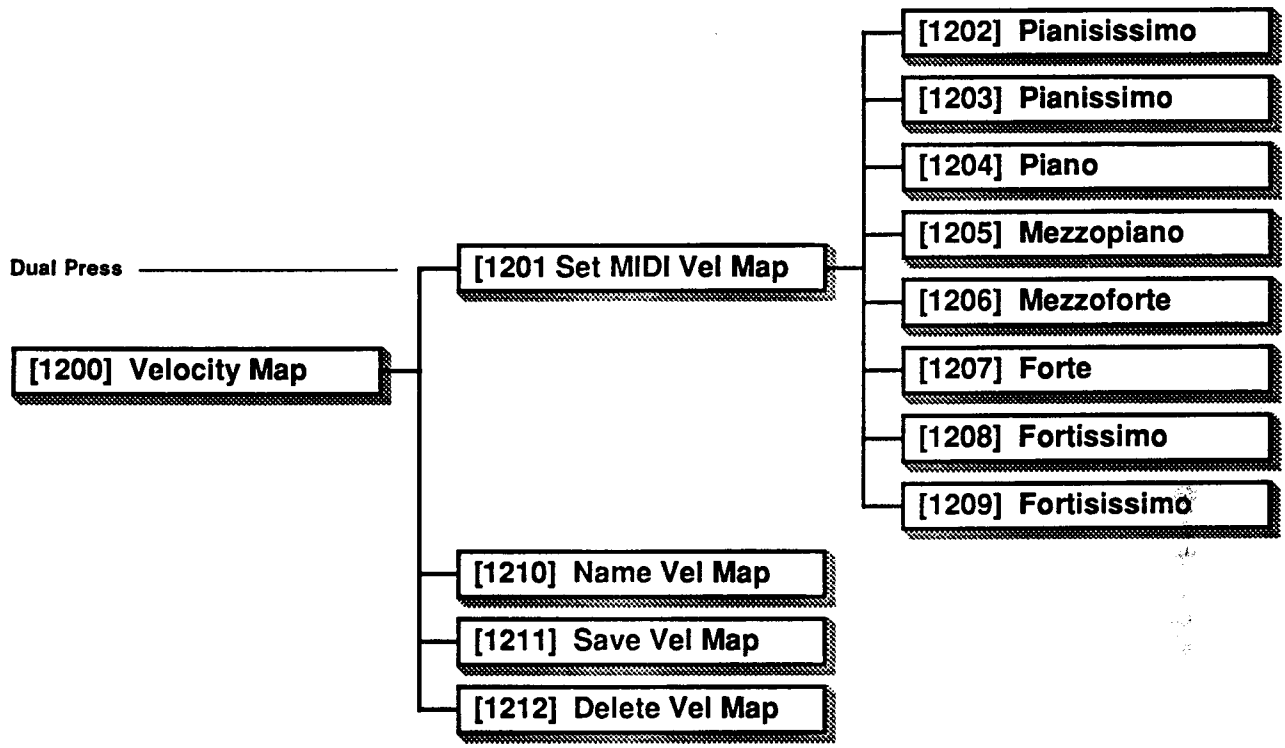
If you wish to create unusual Velocity Maps, or non-linear ones, you can use Parameters 1202 through 1209 to set Values manually.

1202 Pianisissimo
1203 Pianissimo
1204 Piano
1205 Mezzopiano
1206 Mezzoforte
1207 Forte
1208 Fortissimo
1209 Fortisissimo
• 0 to 127 vel
◦ +10 vel

Parameters 1202 through 1209 enable you to edit the current Velocity Map. Editing of Velocity Maps is performed by setting MIDI velocity numbers (abbreviated "vel") for eight relative dynamic levels corresponding to the force with which you strike the keys on your MIDI controller (or K1000 keyboard). These dynamic levels are labeled using standard musical terminology.

The 1000 will calculate the MIDI velocity numbers for every keystrike hardness level in between these Values.

Velocity Maps affect only the 1000's internal response to velocity values. The K1000's MIDI Out velocity values are ***not*** *affected by Velocity Maps.*



1210 Name Velocity Map
• Yes

Enables you to name the current Velocity Map.

A YES answer activates the naming sequence. If you need a review of the naming procedure, see Section 4.4.1 of the *Musician's Guide.*

1211 Save Velocity Map
• Yes

This Function saves (stores) a Map in RAM.

Press YES to initiate the saving sequence. If you need a review of the saving procedure, see Section 4.4.2 of the *Musician's Guide.*

1212 Delete Velocity Map
• Yes

Enables you to delete (erase) the current Velocity Map.

Pressing YES will begin the deletion sequence as described in 4.4.3 of the *Musician's Guide.*

2.4 MIDI Program Map Editing Submenu

1300 MIDI Program Map

This is the heading for the MIDI Program Map editor.

1301 Edit Entries

• Yes

When you select the MIDI Program Map editing Submenu by answering Yes to Parameter 013, you arrive at Parameter 1301, which asks you if you wish to edit the entries in the currently selected MIDI Program Map.

Answer Yes, and the 1000 will begin the editing sequence. You may then use either MENU button to change the List number (address). A dual press of the MENU buttons will increase the List number by 16. Use the PARAMETER buttons to change the Program number associated with the List Entry shown in the display. Dual presses of the PARAMETER buttons jump to Program numbers 000, 001, 064 (if any RAM-based Programs are present) and 128.

When you have made all the changes you want to, press YES, and you will return to the "Edit Entries?" display. You may then press the PARAMETER UP button to select Parameter 1302 (Name MIDI Program Map).

1302 Name MIDI Program Map

• Yes

Enables you to give a unique name to the Map you have edited, prior to saving. This procedure is similar to the naming procedure that is described in Section 4.4 of the *Musician's Guide*.

1303 Save MIDI Program Map

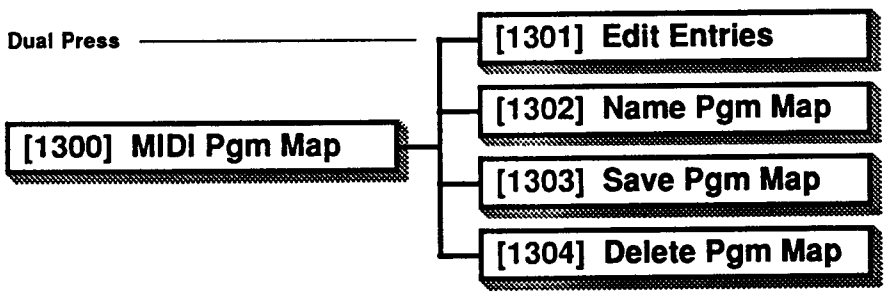
• Yes

Enables you to save a newly-edited Map to RAM. The saving procedure also is described in the *Musician's Guide*.

1304 Delete MIDI Program Map

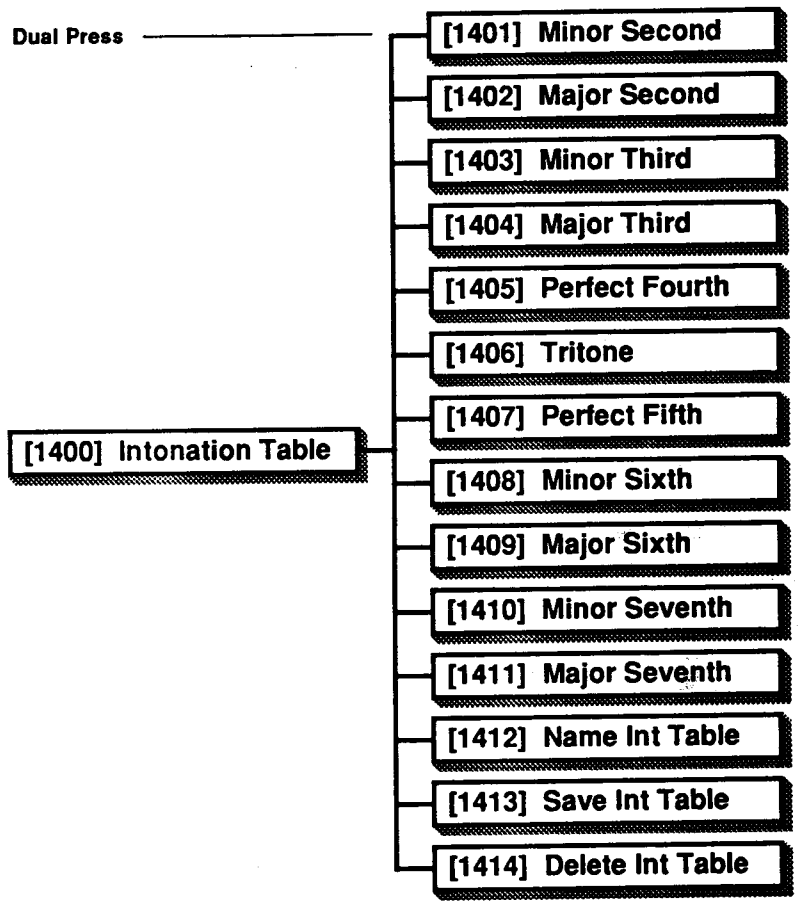
• Yes

Deletes the currently selected Map. See the *Musician's Guide* for a description of the deletion process.



2.5 Intonation Table Editor Submenu

Parameters 1401 through 1411 let you create your own musical scale by modifying the chromatic intervals relative to the tonic.



1400 Intonation Table

When you answer YES in response to Master Parameter 014, you will arrive at Parameter 1400. This is the heading of the Intonation Table Editor Submenu.

1401 Minor Second
1402 Major Second
1403 Minor Third
1404 Major Third
1405 Perfect Fourth
1406 Tritone
1407 Perfect Fifth
1408 Minor Sixth
1409 Major Sixth
1410 Minor Seventh
1411 Major Seventh

- **±1200 ct**
- **+100 ct**

The Values for Parameters 1401 to 1411 may be altered by up to 1200 ct (one octave) up or down, *relative to the notes of the equal-tempered scale.* If the Values for each of these Parameters is set at 0, an equal temperament is achieved.

You can use Parameter 014 (Edit Intonation Table) to study any of the preset Intonation Tables by following these steps:

1) Select the Intonation Table to be examined (Parameter 013);

2) Call up the Intonation Table Editor Submenu using Parameter 014;

3) Study the Values for Parameters 1401 through 1411.

1412 Name Intonation Table

- **Yes**

Use this Function to name (or rename) the current Intonation Table. Press YES to initiate the naming sequence.

1413 Save Intonation Table

- **Yes**

Use this Function to save (store) an Intonation Table in RAM. Press YES to initiate saving.

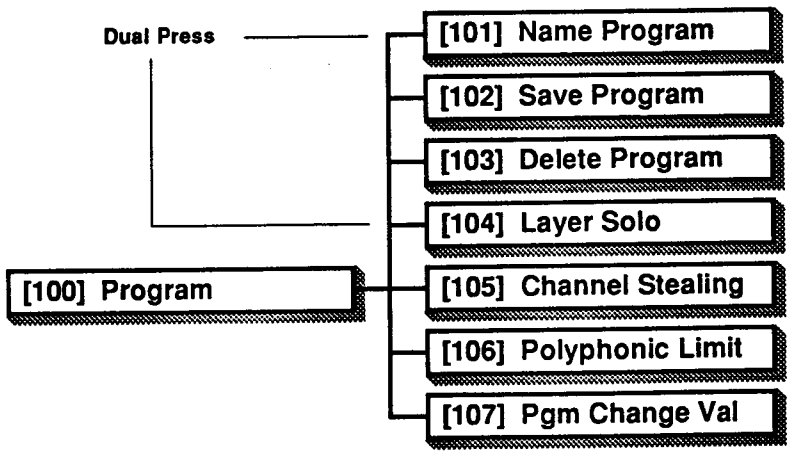
1414 Delete Intonation Table

- **Yes**

Use this Function to delete (erase) the currently selected Intonation Table. Press YES to initiate deletion.

Section III
Program Menu

The Parameters in the Program Menu affect all Layers of the current Program. (In Edit Mode, the Program number appears in the upper right corner of the display.)



100 Program

This is the heading for the Program Menu.

101 Name Program

- **Yes**

This Parameter permits you to name (or rename) the current Program. Press YES to initiate the naming sequence. (See the *Musician's Guide* for a review of naming Objects.)

102 Save Program

- **Yes**
  No

Use this Parameter to save Programs in RAM. For more information on saving Objects, see the *Musician's Guide.*

103 Delete Program

- **Yes**
  No

Enables you to delete the current Program. An answer of YES initiates the deletion sequence. See the *Musician's Guide* for a review of deleting Objects.

104 Layer Solo

- **Off**
  Solo
  Mute

This Parameter enables the current Layer of the current Program to be heard by itself, or to be silenced.

With a Value of Off, you will hear all Layers of the current Program. (This is the default.)

With a Value of Solo, you will hear only the current Layer.

With a Value of Mute, you will hear all Layers *except* the current Layer.

The Value of this Parameter remains constant as long as you stay in Edit Mode and do not save the Program or change Compiled Effects. If you set the Value to Solo, then as you change the current Layer with the LAYER button, you will hear each Layer by itself. You may also move to the Layer Menu, for example, and hear the effects of edits to the Layer.

There are several actions which will cause the Value of Parameter 104 to revert to Off:

- Returning to Play Mode
- Saving the current Program
- Adding or deleting Layers
- Changing from one Compiled Effect to another

Taking any of these actions may surprise you if you have forgotten that you have been soloing or muting Layers, since the sound of your Program will change. It is therefore a good idea to get in the habit of selecting the Layer Solo Parameter and setting it to Off before saving, exiting Edit Mode or changing Compiled Effects.

105 Channel Stealing

- **Mono**
  Poly
  Poly 1
  Poly 2

Enables you to choose between four channel-stealing algorithms.

"Channel stealing" refers to a loss of notes that occurs when the polyphonic limit of a synthesizer is exceeded. Depending on your playing style, you may experience channel-stealing at various points in your performance. Unless you layer heavily, you'll rarely encounter it. If you do, however, you can adjust the Value of this Parameter and possibly avoid channel-stealing.

Mono makes the 1000 a monophonic machine *in the musical sense*: it will play only one note at a time (though it will still produce a stereo output signal). You may find this useful if you are using your 1000 in a multi-synth setup playing a solo that needs to be monophonic.

Poly is the default Value. With a Value of Poly, the stealer uses a complex software routine to determine the most musical way to steal notes when it becomes necessary. This is the Value that you will be most likely to use.

Poly 1 uses a slightly different routine, stealing the same note if it is retriggered before the first note dies out. For example, in a three-Layer Program, one keystrike on your MIDI controller triggers three notes in your 1000 using audio channels 1, 2, and 3. If you strike the same key on your controller before the first three notes have died out, the 1000 will reuse channels 1, 2, and 3, stealing the first three notes and replacing them with the second three.

Poly 2 operates much like Poly 1, but will steal the same note(s) half as often. Continuing the example of a three-Layer Program, if you struck Middle C, you would trigger audio channels 1, 2, and 3 in the 1000. Strike Middle C a second time (before the first notes die out), and you will trigger audio channels 4, 5, and 6 (Poly 1 would have retriggered 1, 2, and 3, stealing three notes). Strike Middle C a third time (before any notes have died out), and the 1000 will retrigger audio channels 1, 2, and 3, stealing the first three notes.

106 Polyphonic Limit

- **Off**
  1 to 20
  (1 to 24 in 1000PX and K1000)
- **+8**

Enables you to set the maximum number of notes that can be played simultaneously in the current Program.

A Value of Off means that there are no restrictions on the number of notes dedicated to a given Program, other than the polyphonic limit of the particular 1000 Series model. (The Kurzweil 1000 PX and K1000 have 24-note polyphonic limits, and the GX, HX and SX have 20-note polyphonic limits.)

A Value other than Off determines the maximum number of simultaneous notes for the current Program.

107 Program Change Value

- **TxPMap**
  1 to 127
- **+10**

Lets you select, for the current Program, the MIDI Program change number that is transmitted at the 1000's MIDI Out port when a MIDI Program Change number is received at the MIDI In port.

A Value of TxPMap will cause the 1000 to transmit Program Change numbers according to whatever TxPMap you have selected with Master Parameter 010 (if the Value of Parameter 010 is "Off," however, nothing will be transmitted from the 1000's MIDI Out Port).

Select any Value between 1 and 127 to have that specific Program number transmitted *regardless of the setting for Master Parameter 010.*

Section IV
Layer Menu

The Parameters in the Layer Menu control the characteristics of individual Layers of the current Program.

You must select a Layer (using the LAYER button) in order to edit it. If you change Layers within this menu, then subsequent edits will affect the newly-selected Layer.

200 Layer

This is the heading for the Layer Menu.

201 New Layer
• Yes

Use this Parameter to add a new Layer to the current Program. See Section 4.2.1 of the *Musician's Guide* for further information.

202 Duplicate Layer
• Yes

This Parameter creates a copy of the current Layer (if space is still available in the current Program). The duplicated Layer takes the next available Layer number, and becomes the current Layer.

Press YES if you wish to duplicate the current Layer.

There are two cases in which the 1000 will not allow you to duplicate Layers. The current Program may already contain the maximum of four Layers, or the Compiled effect assigned to the current Layer may require too many Modules for the 1000 to duplicate (see Section V). In either case, you will be alerted that there are no more Layers available.

NOTE — Some Programs having preset Compiled Effects (Chorus 2, for example) occupy two or more inseparable Layers. If an Effect requiring two Layers is selected for the current Layer in the current Program, then the Duplicate Layer Parameter will copy both Layers. (That is, the original Layer will actually comprise Layers 1 and 2, and duplicating it will create Layers 3 and 4.) If the Effect requires more than two Layers (as some do), the 1000 will be unable to duplicate the Layer.

203 Import Layer
• Yes

Imports an existing Layer, from any Program, into the current Program.

The Layer you select is duplicated and inserted as the next-highest Layer in the Program that you are editing (as long as you have not reached your maximum of four Layers). Importing Layers allows you to move your favorite Layers from Program to Program without having to recreate them from scratch.

If the Program you are importing into uses one or more global Modules (gLFO or gASR), then Programs using the same Module(s) will not appear as you scroll through the Program List.

Pressing YES will begin the importing sequence. See Section 4.2.1 of the *Musician's Guide* for a description of the procedure.

204 Clean Layer
• Yes

Deletes all Effects (Compiled or Modular) associated with the current Layer.

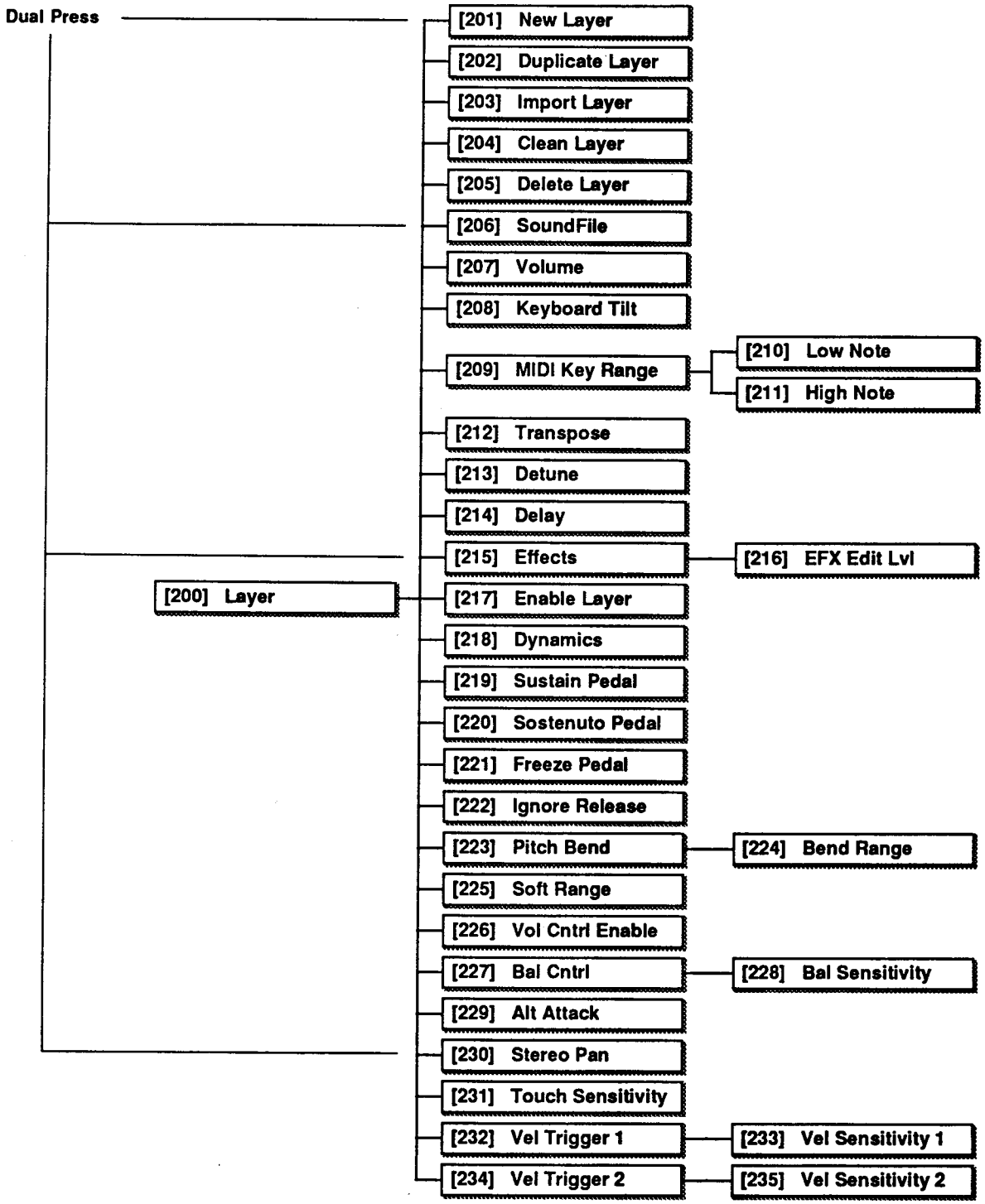
If the Layer is at the Compiled Effects Level, the Effects revert to "None." The Amplitude Envelope for the Layer, if defined, is deleted (see Section 5.6).

If the Layer is at the Modular Effects Level, all local Effects Modules are deleted. If the current Layer is the only Layer in the Program, then all global Modules will also be deleted (see Section V).

Pressing YES will begin the Layer cleaning sequence. Press NO to abort the sequence and return to Parameter 204, or press either PARAMETER button to select another Parameter.

205 Delete Layer
• Yes

Deletes the current Layer and renumbers the remaining


Dual Press
[200] Layer
[201] New Layer
[202] Duplicate Layer
[203] Import Layer
[204] Clean Layer
[205] Delete Layer
[206] SoundFile
[207] Volume
[208] Keyboard Tilt
[209] MIDI Key Range
[210] Low Note
[211] High Note
[212] Transpose
[213] Detune
[214] Delay
[215] Effects
[216] EFX Edit Lvl
[217] Enable Layer
[218] Dynamics
[219] Sustain Pedal
[220] Sostenuto Pedal
[221] Freeze Pedal
[222] Ignore Release
[223] Pitch Bend
[224] Bend Range
[225] Soft Range
[226] Vol Cntrl Enable
[227] Bal Cntrl
[228] Bal Sensitivity
[229] Alt Attack
[230] Stereo Pan
[231] Touch Sensitivity
[232] Vel Trigger 1
[233] Vel Sensitivity 1
[234] Vel Trigger 2
[235] Vel Sensitivity 2

Layers. A deleted Layer cannot be retrieved.

Answer YES to this Parameter in order to remove a Layer from a Program. If the current Program contains only one Layer, the display will notify you and then will return to the "Delete Layer?" display. (A Program must contain at least one Layer to exist, so the 1000 will not allow you to remove the only Layer in a Program.)

206 Soundfile

- **Soundfile List**

Selects one of many possible Soundfiles for the current Layer. A Soundfile is the sampled sound data from which a Layer is constructed.

The list of available Soundfiles varies among models in the 1000 Series. The 1000 PX and the K1000 Keyboard share the same Soundfiles, while the GX, HX, and SX contain Soundfiles featuring guitar, horn, and string timbres, respectively.

207 Volume

- **±48 dB**
  - **+6 dB**

Allows you to set the Volume (loudness) of the current Layer. Use this Parameter to balance Layers against each other.

Keep in mind that a Soundfile played at normal full volume (MIDI velocity = 127 and Amplitude Envelope reaches 100%) has 3–4 dB of headroom in which to get louder. Adjusting Parameter 207 to a Value greater than this will use up headroom quickly, "flattening" the volume curve at its upper limit.

208 Keyboard Tilt

- **±48 dB**
  - **+6 dB**

Enables you to assign a progressive change in volume from the lowest note to the highest note in the current Layer.

For example, if the current Layer spans a keyboard range from C2 to C7 and you set the Value of this Parameter to +36 dB, then C7 will play 36 dB louder than C2 (if you strike both keys with equal force), and there will be a gradual increase as you ascend the scale.

A negative Value causes higher notes to be softer than lower ones.

209 Set MIDI Range

- **Yes**

Defines the area of the MIDI keyboard over which the current Layer will play, by prompting you to strike two keys on your MIDI controller to establish the low and high notes for the current Layer. The range will include the lowest key you struck, the highest key you struck, and all keys in between.

Once you have set the MIDI range for the current Layer, you can check and edit your Values using Parameters 210 and 211.

210 Low Note

- **C–0 to C–8**
  - **+1 octave (12 ST)**

Displays the lowest key of the defined range for the current Layer and allows you to edit it.

The Value is an alphanumeric character representing the keys of a MIDI controller. The letter (A, B, C, etc.) refers to the notes of the chromatic scale. Black keys (e.g. C-sharp) are represented by a letter and the symbol "#."

The numeral indicates the octave number. For example, Middle C is represented as C4. The F-sharp above Middle C is represented as F#4. The highest C on a standard piano is C8, and the lowest is C1. All keys below C1 are in Octave 0.

211 High Note

- **C–0 to C–8**
  - **+1 octave (12 ST)**

Displays the highest key of the range for the current Layer and allows you to change it. Parameter 211 operates in exactly the same fashion as Parameter 210.

Note — The Values you set for Parameters 210 and 211 determine how the display wraps

when you execute a dual press of the VALUE buttons. The available Values for Low Note will not exceed the Value set for High Note, and will wrap to C0 before reaching this limit. The available Values for High will not go below the Value set for Low Note, and will wrap from C8 to the Low Note Value.

212 Transpose

- **±60 ST**
  - **+1 octave (12 ST)**

Transposes the current Layer in intervals of one semitone (ST). Each layer may be transposed up or down a maximum of five octaves.

Transposition allows you to set the pitch of a given Layer's Soundfile to a realistic range on the MIDI keyboard. It also allows you to create an intervallic offset between the pitches of different Layers in a Program.

213 Detune

- **±100 ct**
  - **+10 ct**

Adjusts the pitch of the current Layer up or down as much as one semitone in steps of 1 ct (1/100th semitone). A Value of "0" indicates no detuning.

Detuning is used to alter the pitches of Layers in a Program relative to each other. You can use Parameter 213 to create a chorus effect, for example, by creating multiple Layers using the same Soundfile and detuning each Layer slightly relative to the others.

Detuning can also be used to equally sharpen or flatten all of the Layers within a Program. This will change the pitch of that Program relative to other Programs, without affecting the overall tuning of the 1000.

214 Delay

- **0.000 s to 10.000 s**
  - **Varies depending on the Value range**

Postpones the beginning of the sound in the current Layer. You can use Parameter 214 to create time-delay effects such as echos and strums, or to create Programs that build in density over the duration of a sustained note.

215 Effects

- **None**
  Vibrato
  Delay Vibrato
  Tremolo
  Delay Tremolo
  Leslie
  Chorus 2
  Tremolo 2
  Vibrato/Chorus 2
  Phaser 2
  Leslie 2
  Chorus 3
  Echo 3

Allows you to select from the list of Compiled Effects when the 1000 is set to operate at the Compiled Effects Level (see Section 4.3 of the *Musician's Guide*).

216 Change Effects Edit Level

- **YES**

Selects either Compiled or Modular Effects Levels for the current Layer.

Within any one Program, each Layer may have a different set of Effects. While Modular and Compiled Effects can exist on different Layers in the same Program, however, you must choose one or the other for each individual Layer.

When Parameter 216 has been used to change to Compiled Effects, the characters "FX" and the name of the selected Effect will appear in the lower line of the display for Parameter 215. When Parameter 216 has been used to change to Modular Effects, the word "Modular" will appear as the Value for Parameter 215.

Press YES at Parameter 216 to change Effects Levels.

If you answer NO to the next prompt, you will remain at the current Effects level and the display will return to "Chg FX Edit Lvl?"

If you answer YES, the display will ask if you are sure (as long as you haven't turned off the confirmations). At this point, an answer of NO aborts the change and returns you to the "Chg FX Edit Lvl?" display, while YES puts the change into effect.

Changing from Compiled to Modular Effects enables you to study the Parameters of the current Compiled Effect (see Section 6.6).

217 Enable Layer

• Control Source List

Allows you to enable/disable the current Layer, or assign a MIDI Control Source to do so. A disabled Layer becomes silent.

A Value of OFF disables the current Layer, while a Value of ON enables it.

A Value assigned from the Control Source List permits you to toggle the Layer on and off, depending on the status of the Control Source you assign. For example, if you select a Value of MPress, then the current Layer will play only when aftertouch is applied.

Note — Program Layers are either fully on or fully off. Assigning a continuous Control Source to this Parameter will not fade the Layer in gradually; rather, the Layer will be enabled once the Control Source exceeds its midpoint.

218 Dynamics

• 0 to 90 dB

◦ +6 dB

Limits the dynamic range of the current Layer.

The term "dynamic range" refers to the ratio between the loudest and softest sounds that the Layer can produce. For example, a Value of 60 means that the loudest sound you may trigger for the current Layer will be 60 dB louder than the softest sound.

A Value of 0 will create a Layer with no dynamic range: MIDI Velocity will not affect the loudness of the Layer (though Velocity may still affect the timbre of the Soundfile). A Value of 90 produces a Layer with the maximum dynamic range.

219 Sustain Pedal

• On
Off

Enables/disables the function of the sustain pedal for the current Layer.

Select a Value of Off if you want the current Layer to ignore sustain pedal signals from your MIDI controller.

You can achieve interesting effects by setting Parameter 219 On for some Layers and Off for others. When you strike a chord and then release the keys with the sustain pedal pressed, all Layers with Parameter 219 set to On will continue to play, while those set to Off will begin their release segments.

220 Sostenuto Pedal

• On
Off

Enables/disables the function of the sostenuto pedal for the current Layer.

Select a Value of Off if you want the current Layer to ignore sostenuto pedal signals from your MIDI controller.

If Sostenuto Pedal is enabled, then all notes whose keys are down when the pedal is down will be sustained for their natural duration.

221 Freeze Pedal

• On
Off

Enables/disables the function of the freeze pedal for the current Layer.

Select a Value of Off if you want the current Layer to ignore freeze pedal signals from your MIDI controller.

With Freeze Pedal enabled, when you press the freeze pedal on your MIDI controller, all notes sounding at the time the pedal is pressed will be "frozen" and will sustain without change until the pedal is released — regardless of their normal decay settings.

Combinations of Layers with Freeze Pedal enabled and disabled will allow you to "freeze" some Layers while others continue to play the notes that you strike.

K1000 Owners — You must also set the Values of the Para-

meters for Pedals 1 and 2 (Master Parameters 028 and 029) to the function that you wish to control with those pedals.

222 Ignore Release

- **Off**
  On

Allows the current Layer to respond to, or ignore, MIDI Note Off events (the release of individual keys on your MIDI controller).

Select a Value of Off, and the current Layer will respond normally to the release of keys. This is the default.

Select a Value of On, and the current Layer will ignore the release of keys on your MIDI controller: notes will continue to sound as though you were still holding down the keys that triggered them. Notes with natural decay will eventually die out, but notes with no decay (such as organ and trumpet) will sustain indefinitely. You therefore normally should not set Ignore Release to "On" for non-decaying sounds.

223 Pitch Bend

- **Off**
  Key
  All

Enables/disables Pitch Bend control of the current Layer.

A Value of Off causes the current Layer to ignore pitch bend signals from your MIDI controller.

A Value of Key will allow pitch bend *only* on notes whose triggers are on (keys held down) when the pitch bend is activated. Notes held with Sustain, for example, will not be affected. Pitch Bend will operate on affected notes until they are released.

A Value of All will allow pitch bend on all notes which are sounding when the pitch bend signal is sent, including notes whose keys are actually pressed, as well as notes which are sounding as a result of a Control function or a long release.

224 Bend Range

- **±6 QT**
- **+6 QT**

Sets the amount and direction of pitch bend for the current Layer.

The numerical value of Parameter 224 limits the amount of bend caused by a full throw of the Pitch wheel or lever on your MIDI controller. The maximum is six quartertones (QT), which is the same as three semitones (a minor third). The step size of one quartertone allows you to achieve subtle, microtonal pitch bends.

Negative Values reverse the Layer's response to your MIDI controller's pitch wheel or lever: if you normally push to bend pitch up, a negative Value will cause a push to bend pitch down.

225 Soft Range

- **±48 dB**
- **+6 dB**

Determines the amount of damping (decrease in volume) or boosting (increase in volume) of the current Layer when the soft pedal of your MIDI controller is pressed.

A positive Value will reduce the volume of the current Layer when the soft pedal of your MIDI controller is pressed. A negative Value will boost the volume of the current Layer when the soft pedal is pressed, and a Value of 0 causes no effect on the sound.

226 Volume Control Enable

- **On**
  Off

Enables/disables control over volume for the current Layer by any MIDI control source that can be assigned to MIDI destination 7. The ability to control Layer volume independently allows you to fade individual Layers in and out.

A Value of On means that you may control the volume for the current Layer via MIDI, while a Value of Off causes the current Layer to ignore any volume control signals.

227 Balance Control

• Control Source List

In a single-Layer Program, this functions as a MIDI Layer Volume Control. In a two-Layer Program, used in conjunction with Parameter 228 (Balance Sensitivity), it enables you to perform equal-power crossfades between Layers using any MIDI Control Source.

A Value of Off disables Balance Control.

A Value of On will attenuate (reduce) the Layer's volume by 18 dB.

Assign a Control Source (such as the Mod Wheel) to enable a MIDI control to attenuate the Layer. Figure 4-1 illustrates the effect on Layer volume of Control Sources assigned to Parameter 227.

The solid curve represents the effects of a Control Source when Parameter 228 (Balance Sensitivity) is set at Norm. With the Control Source at minimum, the Layer is not affected. At midpoint, the Layer is attenuated by 3 dB. With the Control Source at maximum, the Layer is attenuated by 18 dB.

The dotted curve represents the effects of reversed (Rvrs) Balance Sensitivity.

If you create a two-Layer Program with different Soundfiles on each Layer, you can use Balance Control to achieve an equal-power crossfade between the two. Assign the same Control Source to each Layer using Parameter 227, then select Parameter 228 and set one Layer to Norm and the other to Rvrs. The resulting crossfade will have a maximum separation of 18 dB.

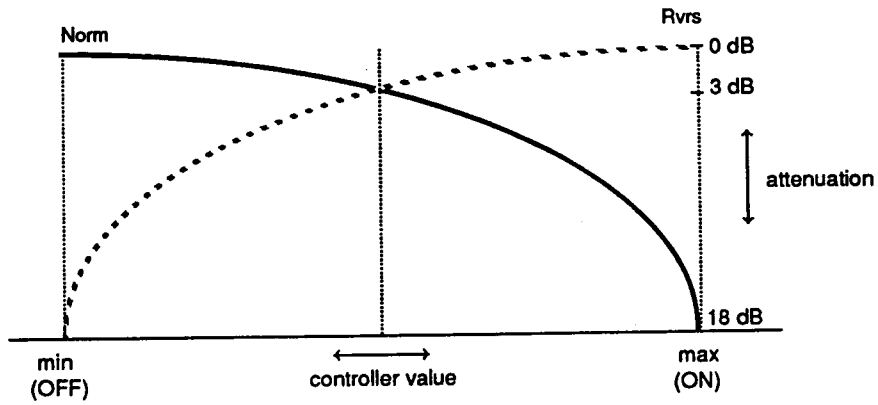


Figure 4-1 Balance Control Response

228 Balance Sensitivity

• Norm/Rvrs

Enables you to determine the polarity of the Balance Control in response to your MIDI controller (see Parameter 227 and Figure 4-1).

229 Alternate Attack

• Control Source List

Allows you to choose between the normal attack of the Layer's Soundfile and an alternate, later point in the Soundfile.

Many of the 1000's Soundfiles begin with a "keyclick" in the attack. The alternate attack eliminates (or greatly reduces) the click of the attack on these sounds. The alternate attack for acoustic instrument timbres corresponds to the beginning of the loop section.

With a Value of Off, the normal attack for the current Layer's Soundfile will always be used.

A Value of On causes the Layer to use its alternate attack point at all times.

Select from the Control Source List to alternate between attack segments using a MIDI Control Source. If the assigned Source is below its midpoint at the start of the note, the normal attack will be used. If it is above midpoint, the alternate attack will be used.

230 Stereo Pan

- **L to R**
  Auto
  Inv Auto

Enables you to define Layer Pan settings between the Left and Right Audio Outputs.

Use either VALUE button to change the Pan location. The display will show an asterisk (*) which indicates the position of the current Layer with respect to the Audio Outputs. There are nine Pan positions, including the extremes.

If you select a Value which exceeds either extreme, the display will change to show two additional Values — Auto Pan and Inv Auto Pan. These provide Pan settings which are a function of MIDI Note number.

Select Auto Pan, and the lowest notes of the Layer will be directed to the Left Audio Output. The highest notes will go to the Right Audio Output, with a progressive pan from left to right for each successively higher note.

Inv Auto Pan provides the reverse of Auto Pan — low notes to the right, and high to the left. (This corresponds, for example, to the seating arrangement of orchestral string sections as heard from the audience perspective.)

231 Touch Sensitivity

- **On**
  Off

Determines how the current Layer will respond to velocity data from your MIDI controller.

Select a Value of On, and higher MIDI Velocity numbers (corresponding to harder keystrikes on your controller) will cause corresponding increases in the loudness of notes.

With a Value of Off, the Layer will have no touch sensitivity. If the Soundfile has multiple timbre levels (as does Grand Piano, for example), the timbre corresponding to the maximum keystrike velocity will always be used. Each note will respond as if it had received a maximum-velocity signal from your MIDI controller.

232 Velocity Trigger 1

- **ppp to fff**

Velocity Trigger 1 is a Logical Control Source. Assigning a Velocity Trigger enables you to initiate an effect depending on the MIDI Velocity number sent by your MIDI controller. This Parameter allows you to set the dynamic level at which the Trigger is activated.

The 1000 checks each Note On signal from your MIDI controller, and compares its MIDI velocity number to the Value that you set for Parameter 232. If the MIDI velocity exceeds the threshold Value of the Parameter, Velocity Trigger 1 switches On (it is normally Off).

The Values for Parameter 232 are the same 8 dynamic levels used to set Velocity Maps. The actual MIDI Velocity required to reach the threshold depends, therefore, on the Velocity Map that you have selected with Master Parameter 004.

The action of Velocity Trigger 1 also depends on the setting of Parameter 233 (Velocity Sensitivity 1).

233 Velocity Sensitivity 1

- **Norm**
  Rvrs

Defines the response of Velocity Trigger 1 to incoming MIDI Velocity signals.

With a Value of Norm, MIDI Velocity signals exceeding the Value of Parameter 232 will switch the Trigger On. Values below that will switch it Off.

A Value of Rvrs reverses the sensitivity of Velocity Trigger 1: the Trigger will normally be On, and will switch Off when the threshold is reached.

234 Velocity Trigger 2
235 Velocity Sensitivity 2

Velocity Trigger 2 functions in the same way as Velocity Trigger 1 (see above).

Section V
Modular Effects Editing

5.1 Introduction

Modular Effects represent the most advanced Program editing level of the 1000 Series.

When you select Modular Effects using Layer Parameter 216, you gain access to a digital emulation of a traditional modular synthesizer comprising a number of building-block elements, or "Modules." By navigating among the Modular Effects Menus and selecting Values for specific Parameters, you can freely "patch" together virtually any logical combination of Modules to obtain a very broad range of effects.

Just as in analog synthesizers, the 1000's Modules are grouped in two basic classes — signal generators and signal modifiers. Signal generators originate waveforms, while signal modifiers accept waveforms at their signal inputs and act upon them in specific ways. Both classes of Modules may be controlled externally by MIDI controllers or other Modules.

Within these two classes, Modules are further distinguished as belonging to either of two separate groups — the audio group and the control group.

The audio group handles the sound signal that is actually heard at the 1000's Audio Outputs. Signals in the audio group originate from the 1000's Soundfile list.

The control group handles signals that are meant not to be heard by themselves, but to affect the actions of other Modules. Control group signals lie in the frequency range between DC and 50 Hz. They include both MIDI controller signals and output signals from control group Modules.

5.1.1 Conceptual Model

Figure 5-1 shows how the 1000's digitally-emulated modular synthesizer might look, were it to be implemented as a traditional analog instrument.

Local Modules — Each Layer of every Program accesses its own set of Local Modules which can provide independent and individual control over each note played in the Layer. Patches among Local Modules are unique to the Layer, and each Layer can have an entirely different Local Module configuration.

The audio group within each Layer begins with the originating Soundfile. Optionally, you can access two envelopes (Amplitude Envelope and Envelope 2), an amplitude modulator (Amplitude Control), and a frequency modulator (Pitch Control).

The remainder of the Local Modules in Figure 5-1 are all in the control group. They can be used to generate and process control signals for routing to the control inputs of Modules in either group within the Layer.

Global Modules — Each Program also may access a set of four Global Modules, all of which are control signal generators. These Modules send the same control signal to every Layer at once, but may be patched independently within each Layer.

5.1.2 Defining & Deleting Modules

To maximize efficient use of the 1000's Program memory, most of the Effects Modules shown in Figure 5-1 do not actually "exist" for a given Layer until you *create* them.

Modules are created simply by selecting any Parameter within their Menus (other than the Menu heading) using either PARAMETER button. Once created, a Module can be *defined* by assigning Values to its Parameters. If a Module has never been defined, or if an existing one has been deleted, it is said to be "undefined."

A Module may be deleted by selecting the first Parameter in its Menu (Delete Module) and answering YES to the prompt. After deleting the Module, the 1000 will return to the Menu heading, where you will see "(undefined)" in the lower line of the display.

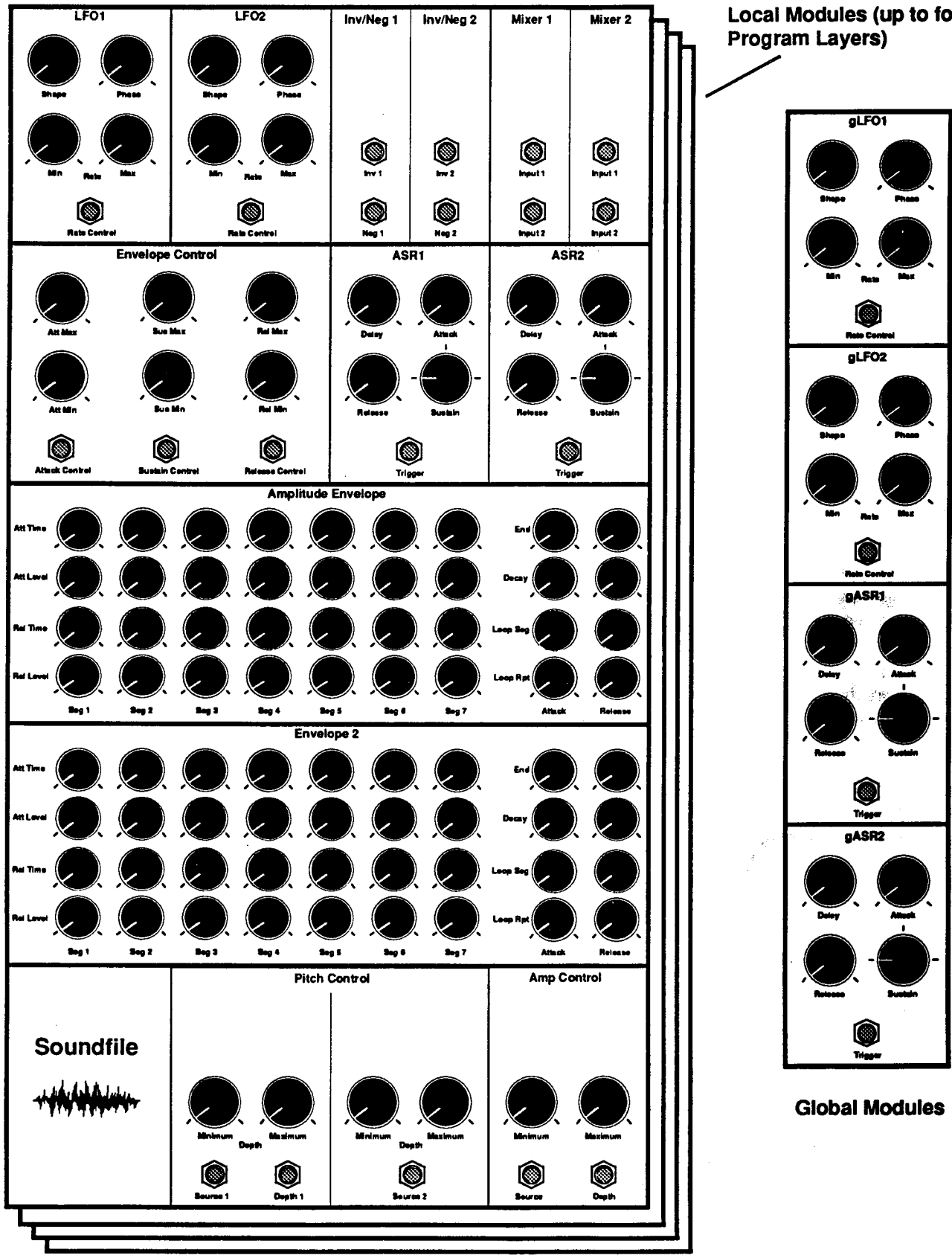


Figure 5-1 Conceptual Model of 1000 Series Modular Effects (Each Program)

Note —In order to keep the memory of your 1000 as free as possible, it is a good idea to delete any Modules that you are not using before saving a Program.

5.1.3 Patching Modules

The outputs of all of the control group Modules in Figure 5-1 can be visualized as being "hard-wired" to the Control Source List.

Where a control input jack is shown in the Figure, it indicates that you may input any logical selection from the Control Source List. All such patching is performed by moving among Parameters in the Menus and changing Values. Where a particular Module's output is not available for a given Parameter, it will not appear in the Control Source List as a possible Value for that Parameter.

The audio group Modules, by contrast, are "hard-wired" as they are created and defined. If no audio signal modifiers are selected, the Soundfile signal passes directly to the Program level. When you create an audio group module (such as Amplitude Envelope), it is automatically inserted in the audio chain.

5.2 Low Frequency Oscillators

The Low Frequency Oscillators (LFOs) are control signal generators that produce low-frequency waveshapes which may be routed to various control inputs. The Outputs of the LFO Modules are normally bipolar, but can be made unipolar by selecting a waveshape preceded by a "+" (see Parameter 415, below).

Each Program may have two global LFOs, and each Layer of every Program may have two local LFOs.

5.2.1 Local Low Frequency Oscillator 1

410 LFO1

This is the Menu heading.

411 Delete LFO1

- **Yes**

Deletes the LFO1 Module. Press YES to begin the deletion sequence.

412 Minimum Rate

- **0.00 Hz to 50.00 Hz**
- **Varies depending on the Value range**

Sets the lowest LFO1 frequency (or rate) for the current Layer. This Parameter also determines the rate of LFO1 when the Rate Control (Parameter 414) is at its minimum Value, or is set to a Value of Off.

413 Maximum Rate

- **0.00 Hz to 50.00 Hz**
- **Varies depending on the Value range**

Sets the highest LFO1 frequency (or rate) for the current Layer. This Parameter also determines the rate of LFO1 when the Rate Control (Parameter 414) is at its maximum Value, or is set to a Value of On.

414 Rate Control

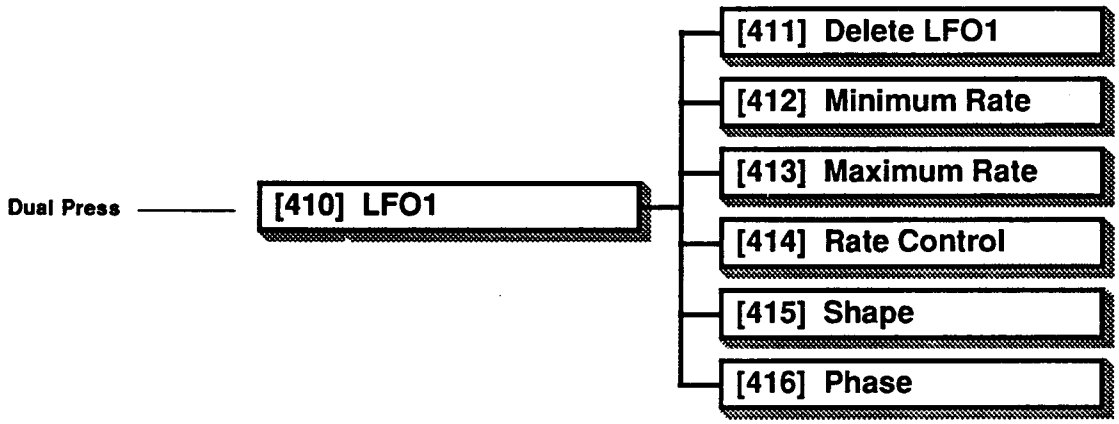
- **Control Source List**

This Parameter selects the rate control input for LFO1.

With a Value of Off, LFO1 will generate a Waveshape at a rate set by the Minimum Rate Parameter (see above). If On is chosen, LFO1 will generate a Waveshape at a rate set by the Maximum Rate Parameter.

You may also select an On/Off switching device, such as "Sustain" (the Sustain Pedal), to feed this input. Any switch will provide the Maximum Rate when the switch is On, and the Minimum Rate when it is Off.

Other Values can select a device that is capable of continuous control (such as Breath, Pressure, or Mod Wheel). Such a device will provide continuously variable control of LFO1's rate within the boundaries set by the Minimum Rate and Maximum Rate Parameters.



415 Shape

- **Sine**
  Cosine
  +Sine
  +Cosine
  Rise Saw
  Fall Saw
  +Rise Saw
  +Fall Saw
  Square
  +Square
  Triangle
  +Triangle
  Dbl Pulse
  Circle
  Stair
  +Stair
  Asym Tri 1
  Asym Tri 2
  White Nz
  Red Nz
  Green Nz
  Blue Nz

Selects the waveshape for LFO1. Waveshapes whose names are preceded by a "+" are unipolar and positive-going; all others are bipolar.

416 Phase

- **0°**
  90°
  180°
  270°

Determines the initial phase (starting point) for LFO1's output waveform.

0° is the beginning of the wave (amplitude 0, becoming positive); 90° is maximum positive amplitude; 180° is 0 amplitude, becoming negative; and 270° is maximum negative amplitude.

5.2.2 Local LFO2

420 to 426 LFO2

Parameters 420 through 426 control the Local LFO2 Module. The programming procedures for LFO2 are identical to those for LFO1, so the descriptions of the Parameters for LFO1 apply to LFO2, as well.

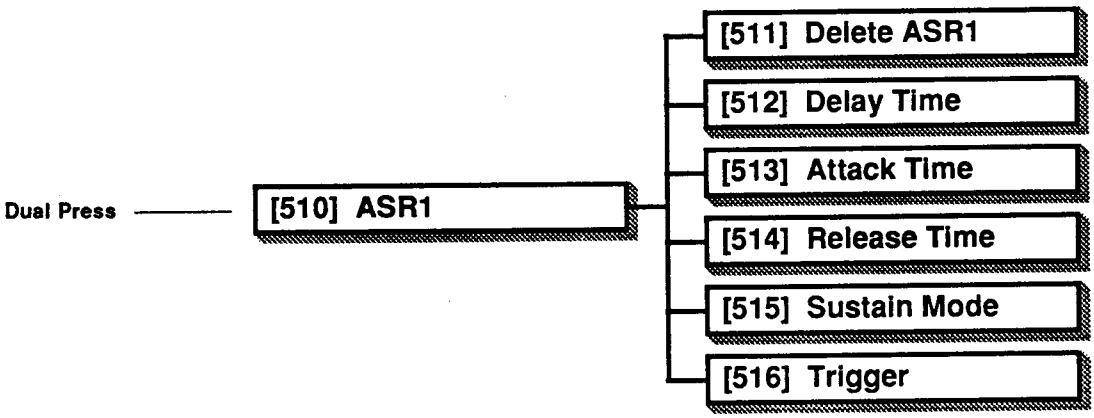
5.2.3 Global LFOs

430 to 436 gLFO1
440 to 446 gLFO2

Parameters 430 through 436 and 440 through 446 control the operation of the Global LFO Modules. The programming procedures for the global LFO Modules are identical to those for LFO1.

Section V

5.3 Attack Sustain Release Envelope Generators



5.3.1 Local ASR1

ASR1 generates, when triggered, a unipolar control signal with three segments that constitute an envelope: attack, sustain, and release.

ASR1 may be assigned from the Control Source List to any control input within the current Layer. The ASR envelope is often used to modify the amount or rate of another control signal.

510 ASR1

This is the Menu heading.

511 Delete ASR1

- **Yes**

Deletes the ASR1 Module from the current Layer. Answer YES to initiate the deletion sequence.

512 Delay Time

- **0.00 s to 10.00 s**
  - **Varies depending on the Value range**

Determines the amount of time, in seconds, before ASR1 begins generating its envelope after it has been triggered.

Select a Value of 0.00 s, and ASR1 will begin its attack segment immediately when it receives a trigger from any source (typically your MIDI controller's keyboard). For Values other than 0.00 s, there will be a time delay equal to the Value.

513 Attack Time

- **0.00 s to 10.00 s**
  - **Varies depending on the Value range**

Determines the length of the attack segment of the current ASR1. The term "attack time" refers to the time required for the attack segment to progress to its maximum, before beginning its sustain or release segment.

514 Release Time

- **0.00 s to 10.00 s**
  - **Varies depending on the Value range**

Determines the length of the release segment for ASR1. The term "release time" refers to the time required for the release segment (at the end of the

sustain or attack segment) to progress to its minimum, which marks the end of the envelope.

515 Sustain Mode

- **Norm**
  Hold
  Rept

Enables you to select among three modes for the sustain segment of ASR1. Each Mode creates a significantly different effect.

Normal Mode causes ASR1 to generate a single two-segment envelope using only the attack and release segments. Even if the trigger is held on indefinitely, ASR1 will progress through its attack segment, then immediately proceed to its release segment, which will continue to the end of the envelope.

Hold Mode causes ASR1 to generate a single three-segment envelope. When the attack segment reaches its maximum, the maximum level will be sustained as long as the trigger for ASR1 is on. When the trigger is shut off, the release segment will begin and progress through to the end of the envelope.

Repeat Mode causes ASR1 to generate repetitive two-segment envelopes. When the end of a release segment is reached, the attack segment will begin again, and the envelope will repeat as long as the trigger is on. Once the trigger is shut off, the envelope will continue to the end of the last release segment.

516 Trigger

- **Control Source List**

Selects a Control Source for triggering ASR1.

With a Value of On, ASR1 will begin generating its envelope when a MIDI Note On is received, then progress according to the Mode that is set with Parameter 515. With the Value set to Off, the ASR will be disabled.

If the selected Control Source is a switch such as the Sustain pedal, ASR1 will be triggered when the switch goes from Off to On, and remains on as long as the switch remains on.

Some Values select Control Sources that are capable of producing continuously varying Control signals (the Modulation Wheel, for example). If you select one of these continuous Control Sources, the Trigger for ASR1 will switch on when the signal from the Control Source exceeds its midpoint. (This threshold is set by the 1000's system software, and is not programmable.)

5.3.2 Local ASR2

520 to 526 ASR2

The Parameters for ASR2 are identical to those for ASR1.

5.3.3 Global ASRs

530 to 536 gASR1
540 to 546 gASR2

gASR1 and gASR2 are global envelopes, so they affect all Layers of the Program to which they are assigned.

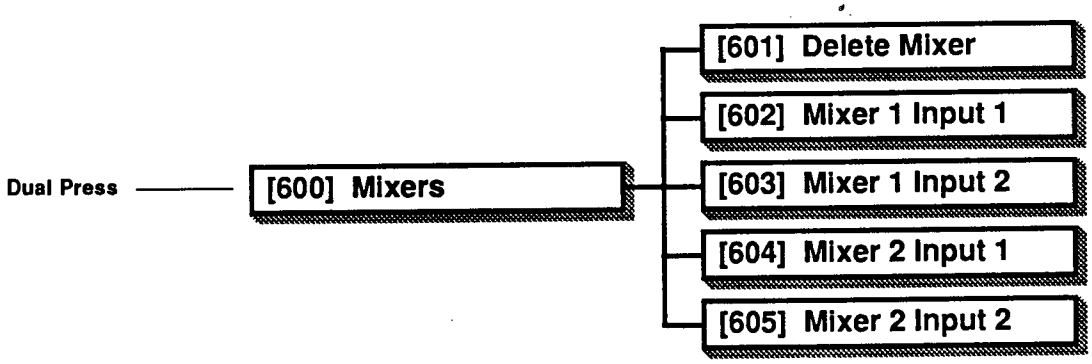
Each Program can have two global ASRs. Each Global ASR may be triggered by a different Control Source, and may be assigned to control different Modules. A global ASR will generate an envelope only if its Program is assigned to a MIDI channel.

The programming of Global ASRs is identical to that of the local ASRs.

Note — "On" may not be a useful Value for gASRs, because with this Value, they would begin their envelopes as soon as their Program is assigned to a MIDI channel.

Section V

5.4 Local Mixers



The 1000 provides two Mixers (MXR1 and MXR2), which may be separately programmed and assigned, for each Layer of a Program. These are local Modules: they affect each note in the current Layer independently.

Each Mixer has two Inputs to which you may assign any of the Layer's Control Sources. The Mixer adds together the two signals at its inputs, limits the sum to within ±1, and presents the sum at its output.

The Mixers' outputs are themselves Control Sources, and appear on the Control Source List, from which they may be assigned to any local Module Parameter that shows "Control Source List" as a Value. While each Mixer output has bipolar capability, it will be effectively unipolar if the mixer inputs are both unipolar control signals.

600 Mixers

This is the Menu heading.

601 Delete Mixer

• Yes

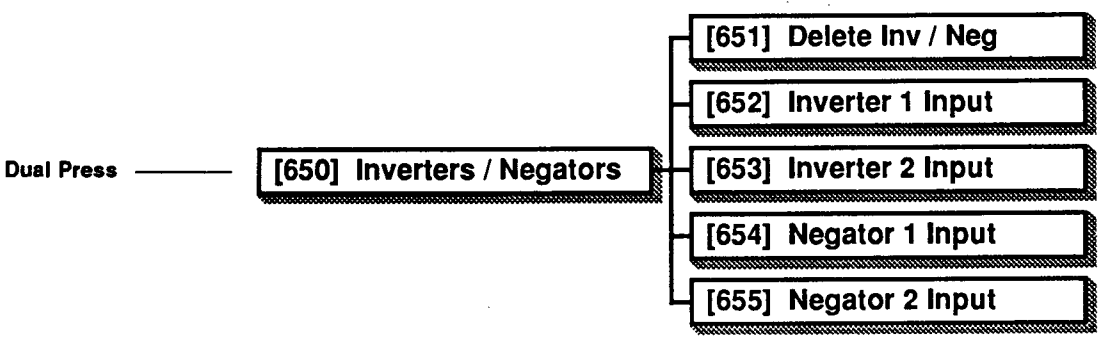
Deletes the Mixer Module for the current Layer. Pressing YES will initiate the deletion sequence.

602 Mixer 1 Input 1
603 Mixer 1 Input 2
604 Mixer 2 Input 1
605 Mixer 2 Input 2

• Control Source List

Parameters 602 to 605 allow you to assign Control Sources to the Inputs of each of the Mixers in the current Layer.

5.5 Local Inverters/ Negators



The Inverters/Negators Module is a multiple-function Local Module: it provides you with two Inverters and two Negators, each of which operates independently, for each Layer in a Program. The Inverters and Negators are control signal processors, and their outputs are available as Control Sources that can be assigned to any local Module Parameter showing "Control Source List" for its Value.

The effect of an Inverter is shown in Figure 5-2. The Inverter reverses the *amplitude* of the input signal, leaving the sign unchanged. Negators are the converse of Inverters: Negators reverse the *sign* of the waveshape, while preserving its amplitude (see Figure 5-3).

Generally, Inverters are used with unipolar signals, while Negators are used with bipolar signals.

650 Inverters/Negators

This is the Menu heading.

651 Delete Inverters/Negators

• Yes

Enables you to delete the Inverter/Negator Module from the current Layer. Press YES to initiate the deletion sequence.

652 Inverter 1 Input
653 Inverter 2 Input

• Control Source List

Parameters 652 and 653 represent the Inputs of Inverters 1 and 2, respectively.

654 Negator 1 Input
655 Negator 2 Input

• Control Source List

Parameters 654 and 655 represent the Inputs of Negators 1 and 2, respectively.

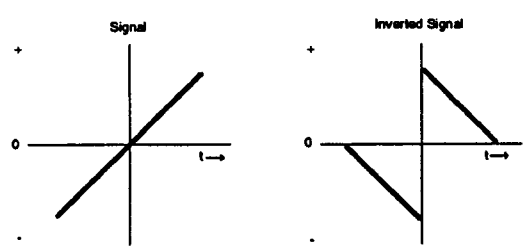


Figure 5-2 Effect of Inverter

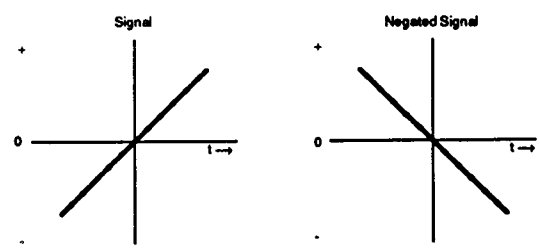


Figure 5-3 Effect of Negator

Section V

5.6 Amplitude Envelopes

Many of the 1000's Soundfiles use Amplitude Envelopes that are created as part of the process of digitizing the sounds.

When you select a Parameter from the Amplitude Envelope Menu, you replace the preprogrammed (or "natural") envelope with a default user-defined envelope having one attack and one release segment. This is your "blank palette" for the construction of your own Amplitude Envelope. (The original envelope is stored in ROM, and will be restored if you delete the user-defined envelope using Parameter 701 or exit EDIT Mode without saving your changes.)

Amplitude Envelopes are unipolar, and may contain up to seven attack and seven release segments. Each segment of the Amplitude Envelope is defined by specifying a time and level. The first attack segment always starts at zero amplitude, and the final release segment always ends at zero amplitude.

Note — The Local Amplitude Envelope and Envelope Control Modules are available at the Compiled Effects Editing Level, as well. The Envelope Control Module is described in Section 5.6.3.

5.6.1 Local Amplitude Envelope

700 Amplitude Envelope

This is the Menu heading.

701 Delete Amplitude Envelope

• Yes

Enables you to delete the Amplitude Envelope Module from the current Layer. Use this Parameter to restore the preprogrammed Amplitude Envelope (if any) to the current Layer.

Pressing YES will initiate the deletion sequence.

702 Add Attack Segment

• Yes

Enables you to add an attack segment to the Amplitude Envelope in the current Layer. Each Layer's Amplitude Envelope may contain as many as seven attack segments.

When you add or delete Envelope segments, any notes that your 1000 is currently playing will be silenced. *You will not be able to play the 1000 while adding or deleting Envelope segments.*

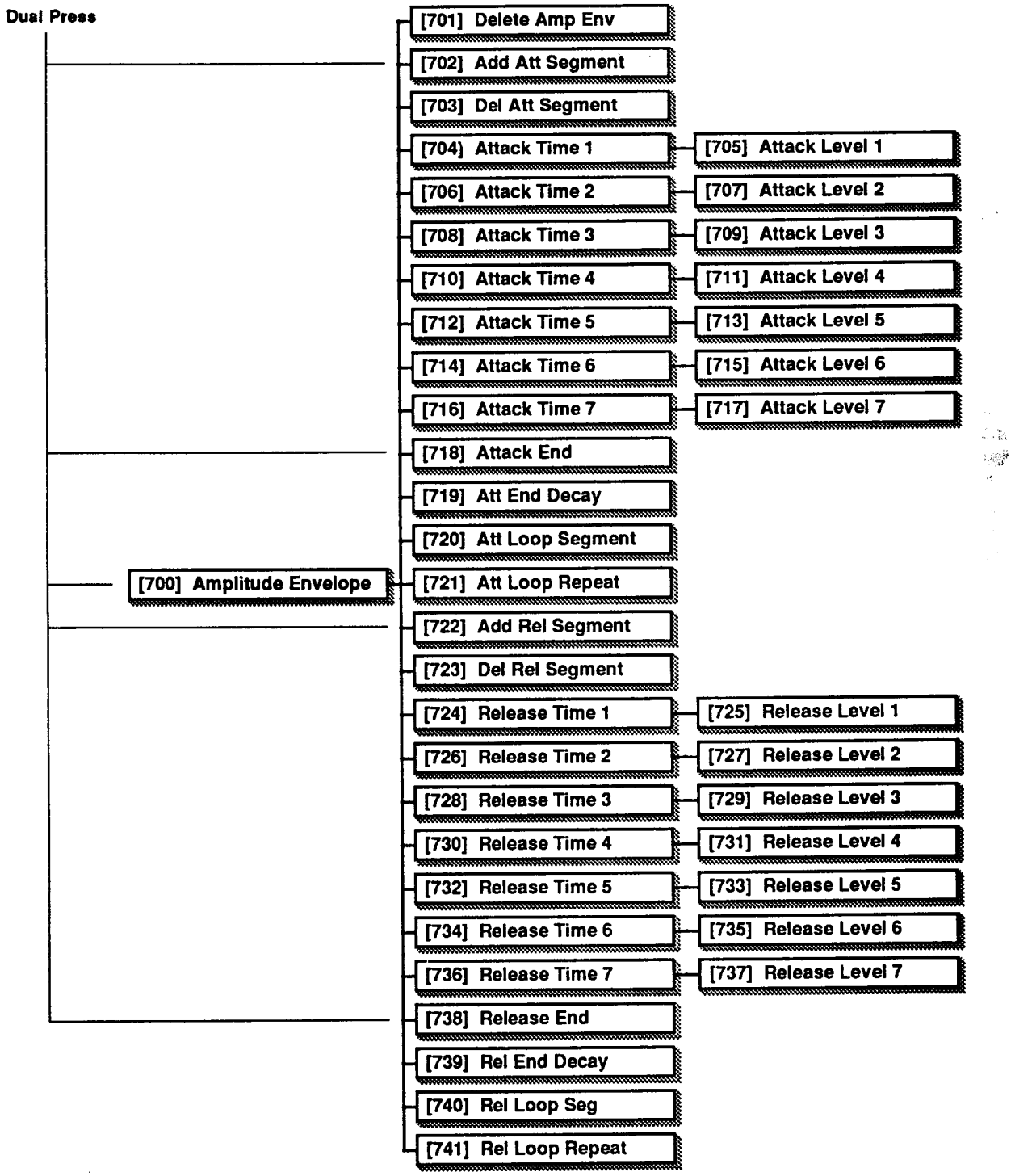
Press YES to start the insertion sequence. The display will prompt you. The lower line will show the index numbers of the envelope's existing segments, and a cursor (single-character underscoring) will show to the right of the highest number.

If you press NO here, you will return to the "Add Attack Seg?" display without adding a segment. (This is a convenient way to check the number of segments in an envelope without changing the envelope.) Press YES to add an envelope segment at the position of the cursor. All higher-numbered segments will be renumbered.

You may change the position of the cursor before pressing YES to select an insertion point between two existing segments. Use the PARAMETER buttons to move the cursor left or right. Choose a cursor location, press YES, and the new segment will appear at the cursor location.

If you attempt to add a segment to an envelope already containing seven segments, the display will alert you and then will return to the "Add Attack Seg?" display.

NOTE — For each attack segment that your Amplitude Envelope contains, a pair of Parameters will be generated (see Parameters 704 through 717, below). These Parameters enable you to set the time and level for each of the attack segments in the envelope.


Dual Press
[700] Amplitude Envelope
[701] Delete Amp Env
[702] Add Att Segment
[703] Del Att Segment
[704] Attack Time 1
[705] Attack Level 1
[706] Attack Time 2
[707] Attack Level 2
[708] Attack Time 3
[709] Attack Level 3
[710] Attack Time 4
[711] Attack Level 4
[712] Attack Time 5
[713] Attack Level 5
[714] Attack Time 6
[715] Attack Level 6
[716] Attack Time 7
[717] Attack Level 7
[718] Attack End
[719] Att End Decay
[720] Att Loop Segment
[721] Att Loop Repeat
[722] Add Rel Segment
[723] Del Rel Segment
[724] Release Time 1
[725] Release Level 1
[726] Release Time 2
[727] Release Level 2
[728] Release Time 3
[729] Release Level 3
[730] Release Time 4
[731] Release Level 4
[732] Release Time 5
[733] Release Level 5
[734] Release Time 6
[735] Release Level 6
[736] Release Time 7
[737] Release Level 7
[738] Release End
[739] Rel End Decay
[740] Rel Loop Seg
[741] Rel Loop Repeat

The programming procedure for each of these pairs of Parameters is identical, with one exception. The Value of Attack segment 1 defaults to 0.00s, and will remain so if you do not change it. The Values of all other Attack segments default to 0.01s, however: only the first Attack segment may have a Value of 0.00s.

The initial level for each Attack segment corresponds to the final level of the segment preceding it. In the case of Attack segment 1, this is always 0; for other segments, it will be equal to the Value that you set for the previous segment.

703 Delete Attack Segment

- **Yes**

Enables you to delete an attack segment of the Amplitude Envelope for the current Layer.

Pressing YES initiates the deletion sequence. The procedure is similar to that for adding attack segments (see Parameter 702, above).

Note — Every envelope must have at least one attack segment. If you attempt to delete an attack segment from an envelope containing only one attack segment, the display will alert you, and then will return to the "Delete Attack Seg?" display without deleting the segment.

704 Attack Time 1

- **0.00 s to 10.00 s**
- **Varies depending on the Value range**

Determines the time in seconds required for Attack segment 1 to progress from zero amplitude to its specified level. (The level for Attack segment 1 is set using Parameter 705.) The default Value for Attack segment 1 is 0.00 s.

705 Attack Level 1

- **0% to 100%**
- **+20%**

Sets the level to which Attack Segment 1 increases during the time specified by Parameter 704.

706 Attack Time 2
707 Attack Level 2
708 Attack Time 3
709 Attack Level 3
710 Attack Time 4
711 Attack Level 4
712 Attack Time 5
713 Attack Level 5
714 Attack Time 6
715 Attack Level 6
716 Attack Time 7
717 Attack Level 7

See the descriptions for Parameters 704 and 705, above.

718 Attack End

- **Sustain**
  Decay
  LoopFwd
  LoopBiD

Defines a special attack segment which begins at the end of the highest-numbered regular attack segment. If you have defined only one attack segment, the Attack End segment will begin as soon as Attack Segment 1 has finished.

The four possible Values have different programming requirements. Parameters 719 through 721 relate only to certain Attack End Values, and will not appear in the display unless the relevant Attack End Value is selected with Parameter 718. If your Amplitude Envelope contains just one attack segment, you will have a choice between only two Values — Sustain and Decay.

Sustain will maintain the ending level of the final regular attack segment as long as the note trigger remains on. The first Release segment will not begin until the note trigger is released. Parameters 719 through 721 will not appear when you have selected Sustain.

Loop Forward will cause part or all of the Attack segment to repeat. You may program which attack segments will be in-

cluded in the loop by using Parameter 720, and how many times the loop will repeat before initiating the release segment by using Parameter 721.

When Loop Forward is selected, the Amplitude Envelope will progress normally through all of its programmed attack segments. Once it reaches the Attack End segment, the envelope will jump to the end of the segment that you specify with Parameter 720. It will ramp to the final level of the specified loop segment in a period of time equal to the Time setting for that segment. The Envelope then will again progress through to the Attack End segment, repeating the process as many times as you specify with Parameter 721.

Loop Bidirectional operates like Loop Forward, except that the Amplitude Envelope is played alternately backward and forward.

When Loop Bidirectional is selected, the Amplitude Envelope will progress normally through its programmed Attack segments. Once it reaches the Attack End segment, instead of jumping back to the beginning of the specified segment, the Envelope will reverse its direction and move back to the end of the specified loop segment.

NOTE — The Attack and Release sections of an Envelope must have more than one segment before you will be able to select either of the looping options.

Decay will cause the Attack End segment to decay to zero amplitude within the time specified by Parameter 719 (described below). If the note trigger is released before the Attack End segment has finished, the release segment will begin at the current amplitude.

719 Attack End Decay

- **0.01 s to 10.00 s**
- **Varies depending on the Value range**

When the Value of Parameter 718 is set to Decay, this Parameter will be enabled. It allows you to determine the amount of time, in seconds, required for the Attack End segment to decay to zero from its specified Value.

720 Attack Loop Segment

- **1 to 7**

Enables you to specify the Attack segment to which the Amplitude Envelope returns when you have selected Loop Forward or Loop Bidirectional.

Note — You cannot assign a Value which is higher than the number of Attack segments in your Amplitude Envelope.

721 Attack Loop Repeat

- **Inf**
  1 to 255
- **+10**

Determines the number of times the Amplitude Envelope will repeat the loop you have specified with Parameters 718 and 720. If you select a Value of Inf (infinite), the loop will repeat without interruption as long as the note trigger is held on; once the note trigger is released, the Envelope will proceed through the Release segment(s).

722 Add Release Segment

- **Yes**

Enables you to add up to seven Release segments to the current Amplitude Envelope. As with Attack segments, every Release segment that you add generates a pair of Parameters relating to the Time and Level for that segment.

Answer YES to add a Release segment. If there are no Release segments in the current Amplitude Envelope, the display will briefly notify you, and then will return to the "AddRelSeg?" display.

With one or more Release segment(s) in the Envelope, pressing YES generates a display with the existing Release segments shown in the lower line of the display, highest-numbered segment on the right.

A cursor will appear immediately to the right of the highest numeral. Use the PARAMETER buttons to move the cursor left and right.

Pressing NO here will return you to the "AddRelSeg?" display without adding the segment.

If you press YES instead, the 1000 will add another segment, and the "AddRelSeg?" display will reappear. If you attempt to add a segment to an Envelope already containing the maximum of seven Release segments, the display will notify you and then the "AddRelSeg?" display will reappear.

723 Delete Release Segment

- **Yes**

Enables you to delete any Release segment in the current Amplitude Envelope.

Press YES to begin the deletion sequence. The procedure is similar to that for adding Release segments (Parameter 722, above).

If the Envelope contains only one Release segment and you attempt to delete it, the display will inform you, and quickly return to the "Del Release Seg?" display.

724 Release Time 1

- **0.01 s to 10.00 s**
- **Varies depending on the Value range**

This Parameter determines the amount of time, in seconds, required for Release Segment 1 to decay from its initial level to the level that you specify with Parameter 725.

Note — Each Release segment has a minimum time Value of 0.01 seconds. To achieve an instantaneous release, you must delete all Release segments, set Parameter 738 (Release End) to Decay, and set Parameter 739 (Release End Decay) to a Value of 0 s.

725 Release Level 1

- **0% to 100%**
- **+20%**

Determines the decrease in amplitude of the current Release segment.

The first Release segment begins at an initial level of 100% and decreases to a percentage (set with this Parameter) of the initial level. The initial level is equal to the final level of the segment preceding it (or, in the case of the first Release segment, the level of the Attack End segment when the note trigger is released).

726 Release Time 2
727 Release Level 2
728 Release Time 3
729 Release Level 3
730 Release Time 4
731 Release Level 4
732 Release Time 5
733 Release Level 5
734 Release Time 6
735 Release Level 6
736 Release Time 7
737 Release Level 7

See the descriptions for Parameters 724 and 725, above.

738 Release End

- **Decay**
  LoopFwd
  LoopBiD

Similar to Parameter 718 (Attack End), this parameter defines a special Envelope segment that begins at the end of the highest-numbered Release segment. If you have added no Release segments, the Release End segment begins when the note trigger is released.

The three possible Values for the Release End segment operate in the same fashion as the corresponding three types of Attack End segments (see Parameter 718). (The Value of Sustain is not available for the Release segment.)

739 Release End Decay
- **0.00 s to 10.00 s**
  - **Varies depending on the Value range**

Identical in function to Parameter 719 (Attack End Decay).

740 Release Loop Segment
- **1 to 7**

Identical in function to Parameter 720 (Attack Loop Segment).

741 Release Loop Repeat
- **Inf**
  1 to 255
  - **+10**

Identical in function to Parameter 721 (Attack Loop Repeat).

5.6.2 Envelope 2

800 to 841 Envelope 2

All of the Parameters for the programming of Envelope 2 are identical to those for the Amplitude Envelope (Parameters 700 through 741).

The sole difference between the Amplitude Envelope and Envelope 2 is that the Amplitude Envelope is unipolar (positive amplitudes only), while Envelope 2 is bipolar (both positive and negative amplitudes can be generated).

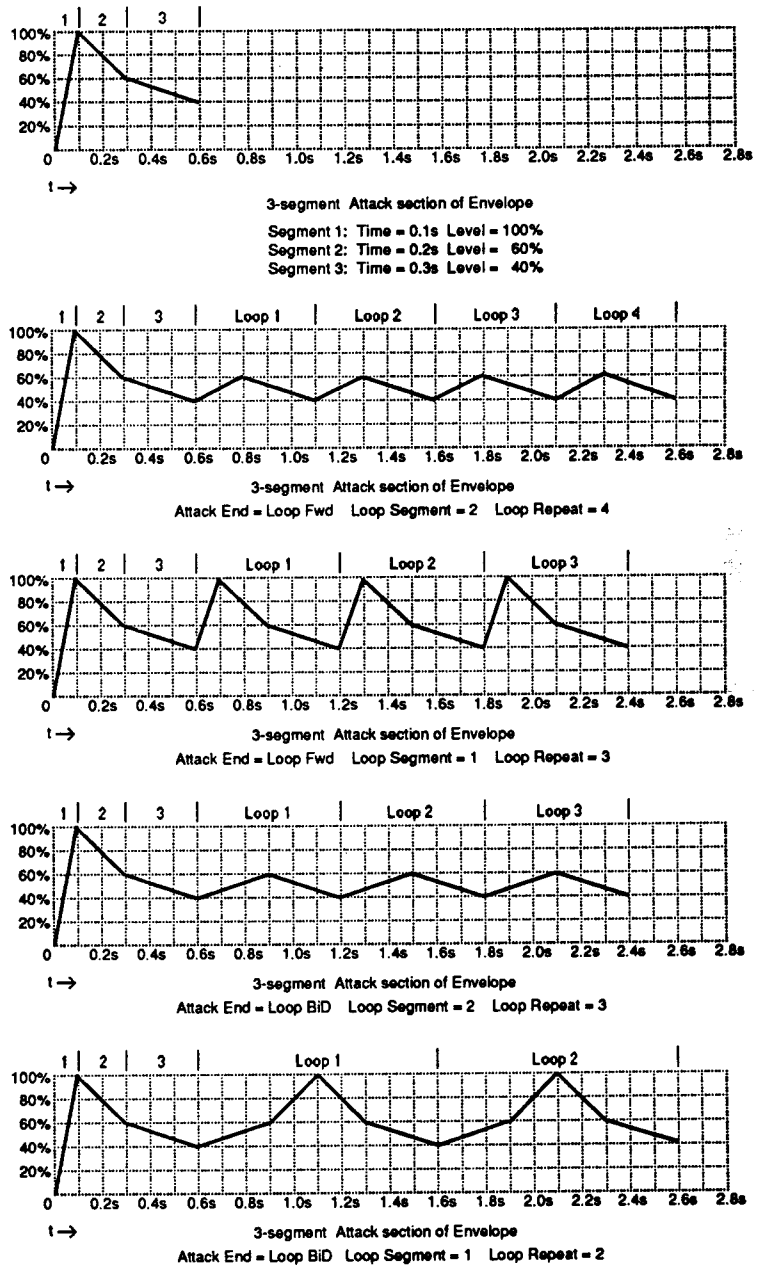
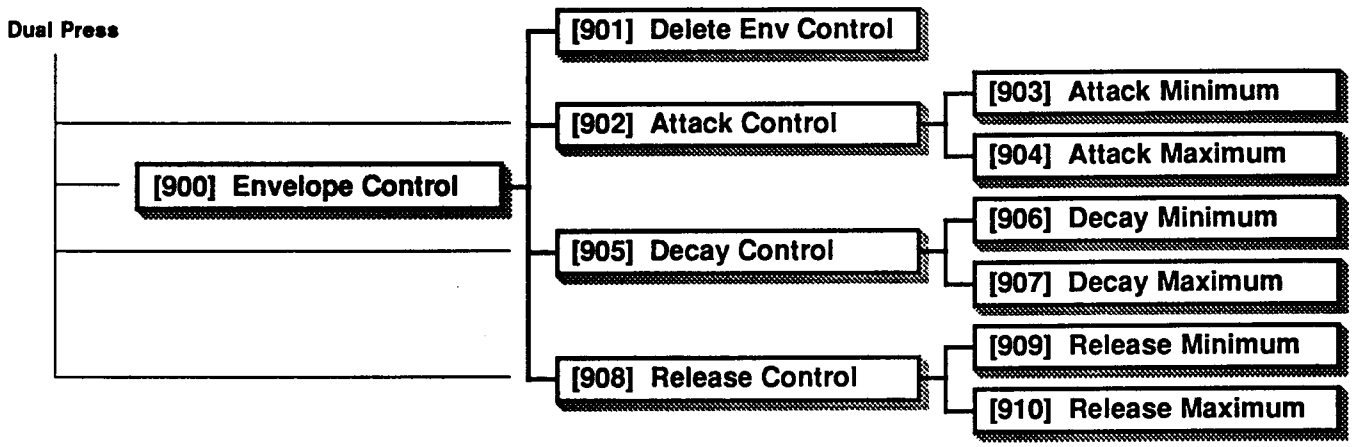


Figure 5-4 Amplitude Envelope Programming Examples



5.6.3 Envelope Control

The Envelope Control Module allows you to assign MIDI Control sources to multiply the specifications for the Amplitude Envelope and Envelope 2 by a factor of 0.1 to 10.0. This gives you real-time control over the specifications that you set for these Envelopes, affording a greater degree of performance versatility.

Note — An Envelope must be defined in order to gain access to Parameters 902 through 904, which affect the Envelope's attack. You do not have to define an Envelope of your own to control the Decay and Release sections of the current Layer's preprogrammed envelope, however.

900 Envelope Control

This is the Menu heading.

901 Delete Envelope Control

- **YES**

Deletes all specifications for the Envelope Control Module. Pressing YES will initiate the deletion sequence.

902 Attack Control

- **Control Source List**

Enables you to determine which Control Source may be used to temporarily modify the Attack rate of both of the Envelopes. The amount of modification is defined by Parameters 903 and 904.

903 Attack Minimum

- **x 0.100 to 10.000**
  - **Increase by factor of 10**

When the assigned Control Source (Parameter 902) sends its minimum Value, the Attack times of all the Attack segments in both Envelopes will be multiplied by the Value of this Parameter. (For example, if the Value is 0.100, the Attack times will be 1/10th their normally programmed Value.)

904 Attack Maximum

- **x 0.100 to 10.000**
  - **Increase by factor of 10**

When the assigned Control Source (Parameter 902) sends its maximum Value, the Attack

rates of all the Attack segments in both Envelopes will be multiplied by the Value of this Parameter. (The 1000 calculates the factor for Control Source Values between minimum and maximum.)

905 Decay Control
- **Control Source List**

Enables you to determine which Control Source may be used to temporarily modify the Decay rate of both of the Envelopes.

Remember that a Decay section will exist only if you have assigned a Value of Decay to the Attack End Parameters (718 or 818) of either Envelope, or if both Envelopes are undefined and the preprogrammed envelope of the current Layer contains a Decay section.

906 Decay Minimum
- **x 0.100 to 10.000**
  - **Increase by factor of 10**

This Parameter operates for Decay rates in the same fashion as Parameter 903 operates for Attack rates.

907 Decay Maximum
- **x 0.100 to 10.000**
  - **Increase by factor of 10**

This Parameter operates for Decay rates in the same fashion as Parameter 904 operates for Attack rates.

908 Release Control
- **Control Source List**

Enables you to determine which Control Source may be used to temporarily modify the Release rate of both of the Envelopes (or of the preprogrammed envelope, if both Envelopes are undefined).

909 Release Minimum
- **x 0.100 to 10.000**
  - **Increase by factor of 10**

This Parameter operates for Release rates in the same fashion as Parameter 903 operates for Attack rates.

910 Release Maximum
- **x 0.100 to 10.000**
  - **Increase by factor of 10**

This Parameter operates for Decay rates in the same fashion as Parameter 904 operates for Attack rates.

5.7 Pitch Control

The Pitch Control Module enables you to define two Control Sources for pitch modulation in each Layer of a Program. (See flowchart, next page.)

Note — You do not have to define a Pitch Control Module in order to achieve Pitch Bend Effects. Pitch Bend is "hardwired" to pitch control, and will function according to your specifications (Parameters 223 and 224) regardless of the status of the Pitch Control Module.

920 Pitch Control

This is the Menu heading.

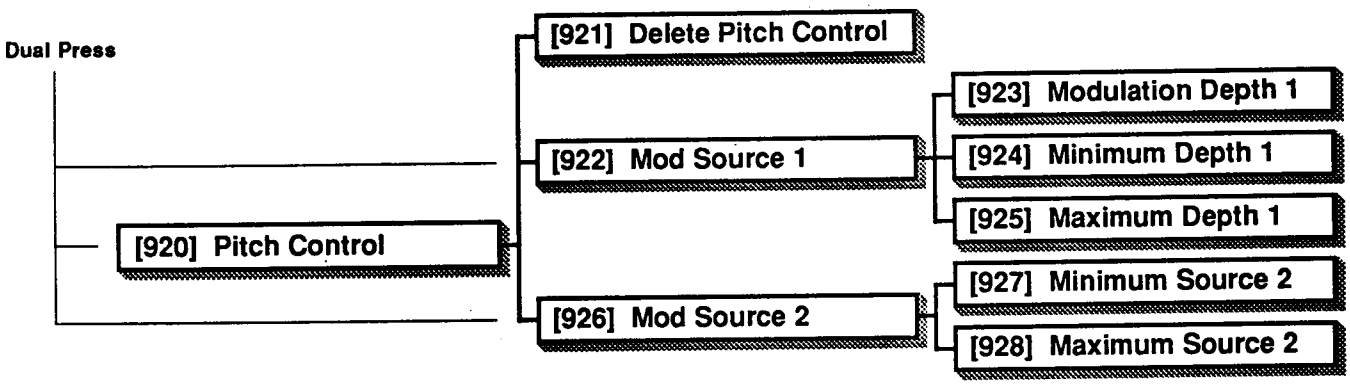
921 Delete Pitch Control
- **Yes**

Deletes the Pitch Control Module from the current Layer. Pressing YES will initiate the deletion sequence.

922 Modulation Source 1
- **Control Source List**

Determines which Control Source modifies pitch in the current Layer. Many of the 1000's preset Programs assign LFO1 as the Value for this Parameter, creating a Vibrato effect whenever LFO1 is triggered.

Section V



923 Modulation Depth 1

• Control Source List

Allows you to assign a Control Source to modify the depth of pitch modulation.

924 Minimum Depth 1

• ±100 ct

◦ +10 ct

Use this Parameter to define a fixed depth of pitch modulation at the minimum signal sent by Modulation Source 1. Pitch may be deflected up or down as far as one semitone (100 ct).

925 Maximum Depth 1

• ±100 ct

◦ +10 ct

Use this Parameter to define a fixed depth of pitch modulation at the maximum signal sent by Modulation Source 1.

926 Modulation Source 2

• Control Source List

This Parameter gives you a second source of control over pitch modulation.

Unlike Modulation Source 1, Modulation Source 2 does not allow a separate Control Source to modify the depth of modulation. Minimum and maximum pitch deflection are determined directly according to the Values you set with Parameters 927 and 928.

927 Minimum Source 2

• ±100 ct

◦ +10 ct

Defines the amount of pitch modulation which will occur when Modulation Source 2 sends its minimum signal.

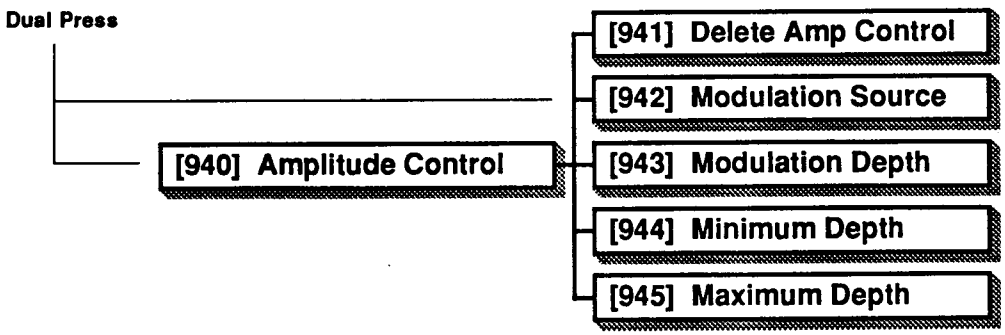
928 Maximum Source 2

• ±100 ct

◦ +10 ct

Defines the amount of pitch modulation which will occur when Modulation Source 2 sends its maximum signal.

5.8 Amplitude Control



The Amplitude Control Module enables you to assign a Control Source to amplitude modulate the current Layer's output signal. The modulation is imposed in addition to — not in place of — the Amplitude Envelope (preprogrammed or user-defined).

940 Amplitude Control

This is the Menu heading.

941 Delete Amplitude Control

- **Yes**

Enables you to delete the Amplitude Control Module. Press YES to initiate the deletion sequence.

Note — Deleting the Amplitude Control Module will not change the Amplitude Envelope. It merely removes the additional control over amplitude modulation that the Amplitude Control Module provides.

942 Modulation Source

- **Control Source List**

Enables you to assign the Control Source with which you will control Amplitude modulation.

943 Modulation Depth

- **Control Source List**

Enables you to assign a Control Source determining the amount (depth) of the modulation caused by the Amplitude Control Module.

944 Minimum Depth

- **±48 dB**
- **+6 dB**

Sets the amount (depth) of amplitude modulation when the Modulation Source (from Parameter 942) transmits its minimum signal.

945 Maximum Depth

- **±48 dB**
- **+6 dB**

Sets the amount (depth) of amplitude modulation when the Modulation Source (from Parameter 942) transmits its maximum signal.

Section VI
PROGRAMMING TUTORIAL

6.1 Introduction

This section presents representative examples of Modular Effects editing (Compiled Effects editing is covered in the *Musician's Guide*). Designed to clarify the basic concepts of 1000 Series programming, these illustrations can also serve as jumping-off points for creating your own effects.

6.1.1 Initial Setup

In preparation for making totally new Programs, you may find it convenient to create and save a "blank palette" Program from which to work. The following procedure creates a single-Layer Program with no Effects and a default "natural" Amplitude Envelope:

- Select any Program on the 1000, then press the PLAY/EDIT button to enter EDIT Mode.
- Using the LAYER button, check to see whether the Program contains more than one Layer. If it does, select Parameter 205 (Delete Layer) and delete all Layers except for Layer 1.
- Select Parameter 204 (Clean Layer) and press the YES button to delete any Effects from the Layer.
- Using Parameter 216, set the Effects Edit Level to Modular (if it is not already so defined).
- Optionally, return to Parameter 206 (Soundfile) and select a default Soundfile for your palette Program.
- Using Parameters 101 (Name Program) and 102 (Save Program) in the Program Menu, name the Program "Palette" and save it to RAM. (If you save it as Program 64, then you'll be able to reach it quickly and easily with dual presses of the PROGRAM buttons.)

Whenever you want to create a new Program, select the "Palette" Program from PLAY Mode before entering EDIT Mode.

6.2 Vibrato

Vibrato is a slow, regularly-pulsing variation in the pitch of a note, used by instrumentalists to "sweeten" a tone and give it more "warmth."

Figure 6-1 illustrates a Vibrato patch. The Pitch Control Module is used to produce programmed pitch modulation of the Soundfile by Local LFO1. To create this patch:

- Select the "Palette" Program and enter EDIT Mode. Optionally, select a different Soundfile for the new patch.
- Move to the Pitch Control Menu (number 920), select Parameter 922 (Source 1), and set its Value to LFO1. (Dual presses of the Parameter buttons will be helpful here.)
- Select Parameter 923 (Modulation Depth 1) and set its Value to ON.
- Set Parameter 925 (Maximum Depth) to 10 ct.
- Move to the LFO1 Menu (number 410), and set Parameter 413 (Maximum Rate) to 4.00 Hz.
- Set Parameter 415 (Shape) to Sine.
- Finally, set Parameter 414 (Rate Control) to ON.

When you play your keyboard, you will hear that each note now has a slow, regular vibrato effect imposed on it.

You can begin to elaborate on this patch by assigning different Control Sources to Parameters 414 (LFO1 Rate Control) and 923 (Pitch Control Modulation Depth 1). Greater Values for Parameters 413 (LFO1 Maximum Rate) and 925 (Pitch Control Maximum Depth 1) will produce more extreme effects.

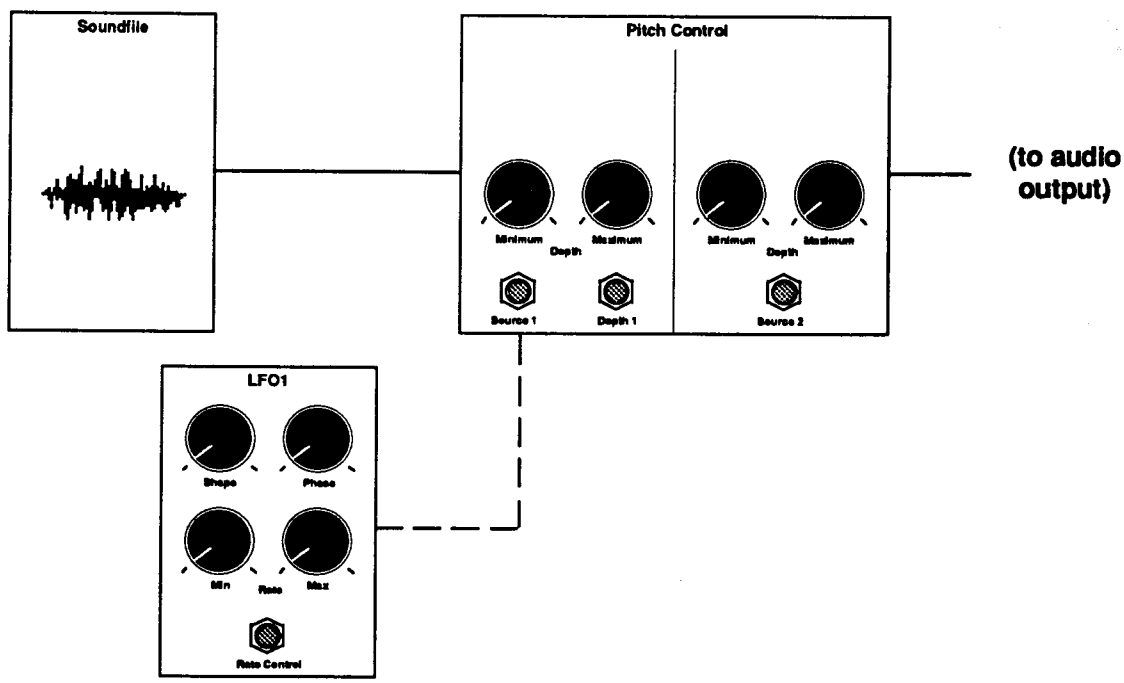


Figure 6-1 Vibrato Effect

6.3 Tremolo

Tremolo is similar to vibrato, but represents a variation in amplitude rather than pitch. Tremolo is included in most guitar amps, and the vibraphone incorporates an acoustical tremolo that is produced by a set of rotating valves inside its resonators.

Figure 6-2 illustrates a Tremolo patch (notice the similarity to Figure 6-1). The Amplitude Control Module is used to produce amplitude (loudness) modulation of the Soundfile by Global LFO1.

To create this patch:

- Select the "Palette" Program and enter EDIT Mode. Optionally, select a different Soundfile for the new patch.
- Move to the Amplitude Control Menu (number 940), select Parameter 942 (Modulation Source), and set its Value to gLFO1.
- Select Parameter 943 (Modulation Depth) and set its Value to ON.
- Set Parameter 945 (Maximum Depth) to -3 dB.
- Move to the gLFO1 Menu (number 430), and set Parameter 433 (Maximum Rate) to 5.00 Hz.
- Finally, set Parameter 434 (Rate Control) to ON.

When you play your keyboard, you will hear that each note now has a tremolo effect imposed on it.

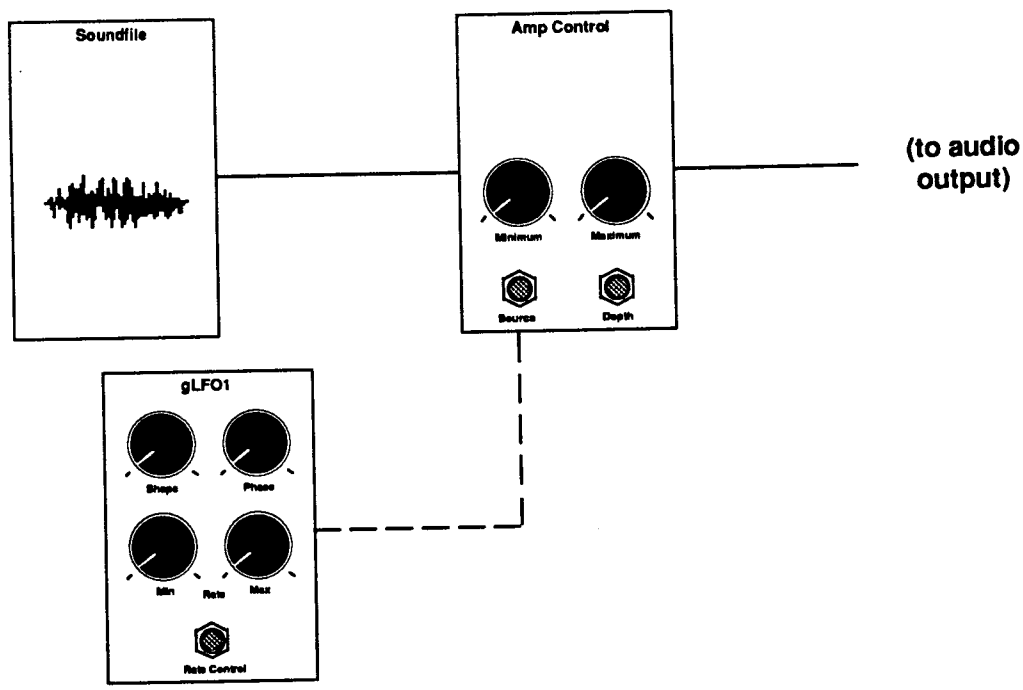


Figure 6-2 Tremolo Effect

6.4 Chorus

You can elaborate on this patch by assigning different Control Sources to Parameters 434 (gLFO1 Rate Control) and 943 (Amplitude Control Modulation Depth). Greater Values for Parameters 433 (gLFO1 Maximum Rate) and 945 (Amplitude Control Maximum Depth) will produce more extreme effects.

Note — We have used a Global LFO in this patch because tremolos on existing instruments (such as guitars and vibraphones) are global effects. That is, the tremolo effect "free-runs" all the time, and is imposed on every note in the same fashion. This differs from vibrato, which — on a clarinet, for example — is imposed by the player on each note individually.

Chorusing is a pitch-related effect which simulates the sound of a section of instruments or voices (hence the term "chorus"). In such a section, minute variations in the pitches of individual voices produce a constantly varying cloud of "beat" frequencies as voices go in and out of tune with one another.

We can approximate this sound by using two Layers, each patched for a vibrato effect as shown in Figure 6-3. To create a chorus effect:

- Select the "Palette" Program and enter EDIT Mode. Optionally, select a different Soundfile for the new patch.
- Following the instructions in Section 6.2, give the current Layer a vibrato effect, but with the following changes:
  - In the Pitch Control Menu, set Parameter 924 (Minimum Depth) to -2 ct and Parameter 925 (Maximum Depth) to +2 ct.
  - In the LFO1 Menu, set Parameter 413 (Maximum Rate) to 0.08 Hz.
- Now, select Layer Parameter 202 (Duplicate Layer) and press YES. The 1000 will create a second Layer for the current Program.
- Select Parameter 213 (Detune) of Layer 2 and set it to 10 ct.

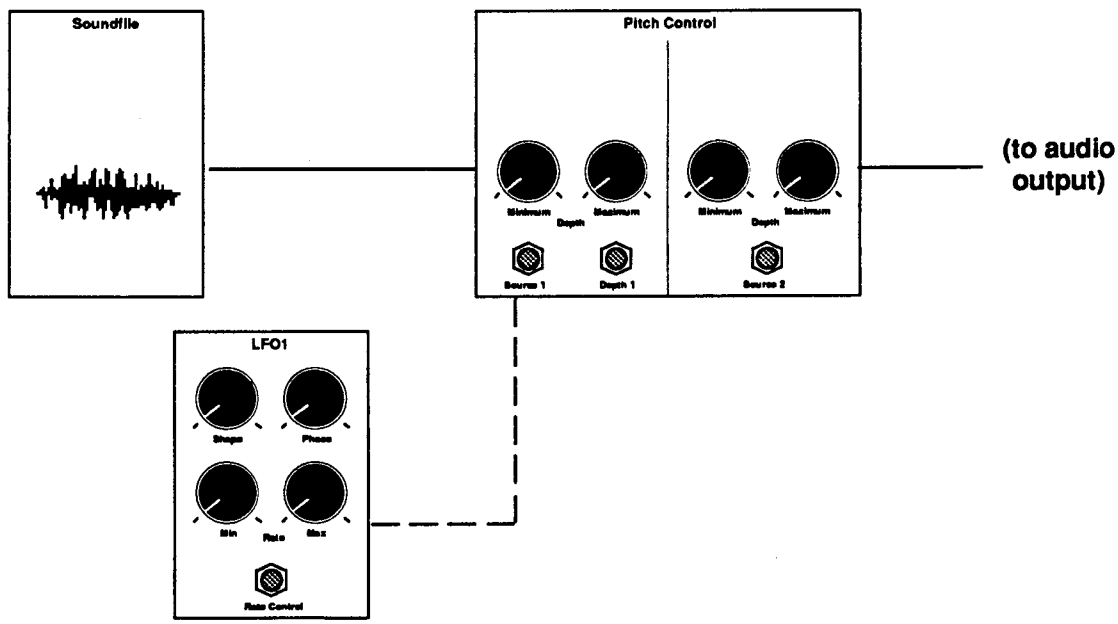


Figure 6-3 Chorus Effect (Each of Two Layers)

6.5 Leslie

- Move to Parameter 413 (Maximum Rate) of Layer 2 and set it to 0.05 Hz.

When you play your keyboard, you will hear that each note now has a slow, irregular varying chorus effect imposed on it. The density of the effect will change as you play thicker chords with different start times for individual notes.

You can elaborate on this patch by assigning different Control Sources to Parameters 414 (LFO1 Rate Control) and 923 (Pitch Control Modulation Depth 1). Greater Values for Parameters 413 (LFO1 Maximum Rate) and 925 (Pitch Control Maximum Depth 1) will produce more extreme effects.

The Leslie effect originated with a special loudspeaker cabinet that was made for Hammond electric organs. Within this cabinet, both the high-frequency and the low-frequency driver elements were coupled to a motor drive shaft that made them physically rotate. When the motor was switched on, a distinctive combination of pitch and amplitude modulation was produced as the elements whirled around in the cabinet.

We can approximate this effect with the patch in Figure 6-4 (next page). This complicated, two-Layer patch provides programmed pitch and amplitude modulation by two Global LFOs, controllable by the Modulation Wheel of the K1000 or MIDI controller. To create this patch:

- Select the "Palette" Program and enter EDIT Mode. Optionally, select a different Soundfile for the new patch.
- Following the instructions in Section 6.2 and 6.3, give the current Layer both a vibrato effect and a tremolo effect, but with the following changes:
  - Make gLFO1 the Modulation Source for the Amplitude Control Module, and gLFO2 the Source for the Pitch Control.
  - In the Pitch Control Menu, set Parameter 924 (Minimum Depth 1) to -6 ct and Parameter 925 (Maximum Depth 1) to -14 ct. Set Parameter 923 (Modulation Depth 1) to MWheel.
  - In the Amplitude Control Menu, set Parameter 944 (Minimum Depth) to -3 dB and Parameter 945 (Maximum Depth) to -9 dB. Set Parameter 943 (Modulation Depth) to MWheel.
  - In the gLFO1 Menu, set Parameter 432 (Minimum Rate) to 3.60 Hz and Parameter 433 (Maximum Rate) to 7.50 Hz.
  - In the gLFO2 Menu, set Parameter 442 (Minimum Rate) to 3.60 Hz and Parameter 443 (Maximum Rate) to 6.30 Hz. Set Parameter 445 (Shape) to +Cosine.
- Now, select Layer Parameter 202 (Duplicate Layer) and press YES. The 1000 will create a second Layer for the current Program.
- In the Pitch Control Menu of Layer 2, set Parameter 924 (Minimum Depth 1) to +6 ct and Parameter 925 (Maximum Depth 1) to +14 ct.

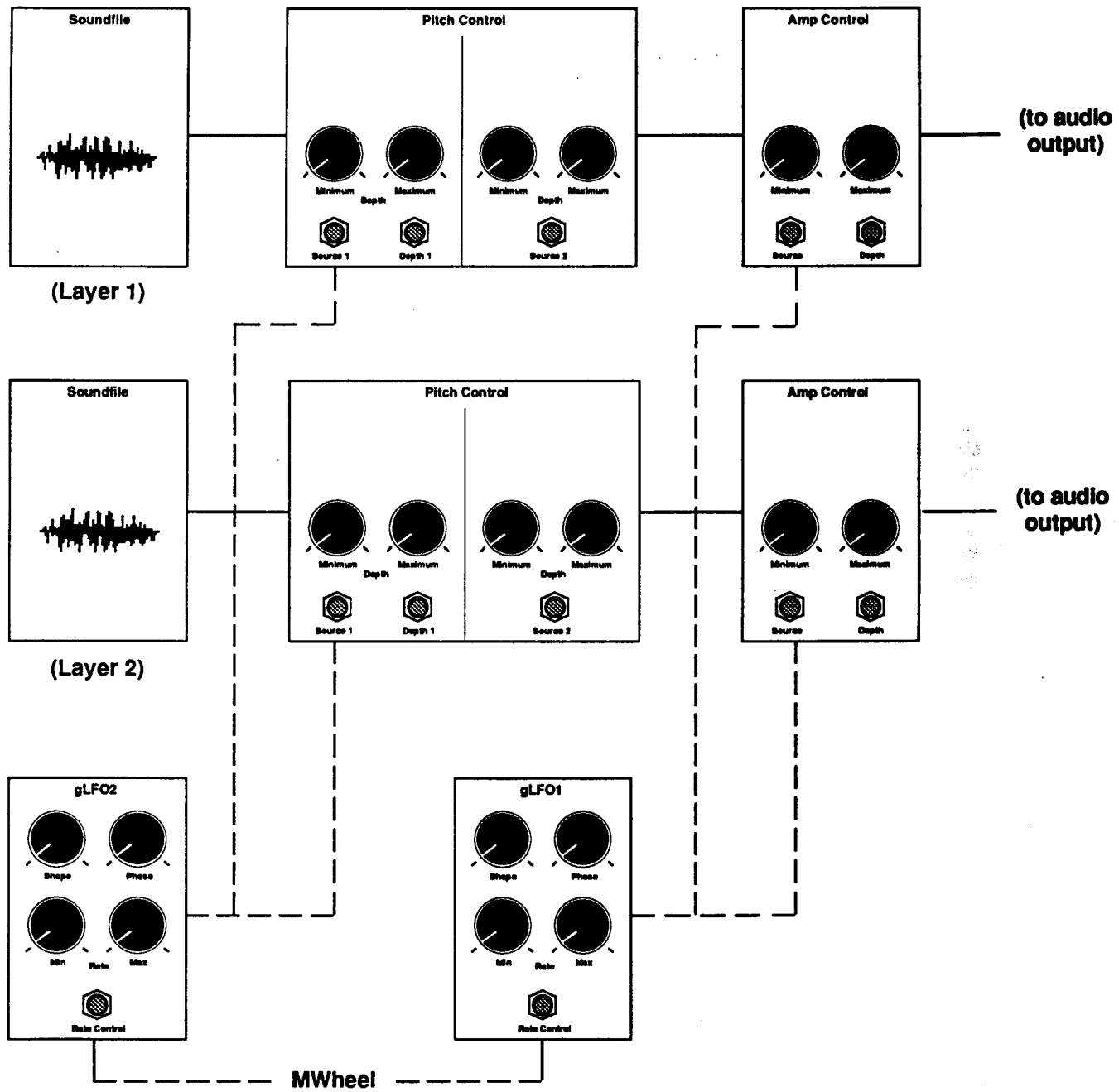


Figure 6-4 Leslie Effect

- In the Amplitude Control Menu of Layer 2, set Parameter 944 (Minimum Depth) to +3 dB and Parameter 945 (Maximum Depth) to +9 dB.

When you play your keyboard, you will hear that the Program now has a slow, regular Leslie effect imposed on it. Adjusting the Mod Wheel should vary the intensity of the effect.

6.6 Conclusion

These relatively simple examples only hint at the true programming power of the Kurzweil 1000 Series. By carefully studying this *Programming Reference* and experimenting with your 1000's editing features, you will learn how to harness that power.

As an aid in learning about Effects editing, you can study the 1000's preprogrammed Compiled Effects. Assign a preset Compiled Effect to your "Palette" Program, then use Parameter 216 (Efx Edit Level) to change the Efx Edit Level to Modular. This will give you access to the Modular Effects Menus, allowing you to scroll through their Parameters and study the programmed Values for the Compiled Effect. (Changing from the Compiled to Modular Effects Level will also give you access to the "invisible" Layers generated by the more complex Compiled Effects.) You can also edit these Values, and then save the current Program to a RAM location.

Note — If you return to the Compiled Effects Level before saving a Program which you have modified in this fashion, you will lose your changes. When you change from Modular to Compiled Effects, the connections between Modules are removed and replaced with the pre-programmed patches of the selected Compiled Effect.

By applying your own personal creativity to Modular Effects editing, you can create a wealth of Programs that are uniquely yours, tailored to your personal musical style. And as you gain proficiency with the 1000's editing features, you'll find that the instrument allows you plenty of room to grow. In that process, it's important to remain open to the unexpected. Feel free to experiment with things that might seem illogical: some of the best Programs can be generated by "accident."

7.1 1000 Series Program Lists

1	Grand Piano
2	Fast Strings
3	Choir
4	Vibes
5	Acoustic Bass
6	Trumpet
7	Baritone Horn
8	Clarinet
9	Electric Organ
10	Rock Organ
11	Jazz Organ 1
12	Electric Piano
13	Digital Electric Piano
14	Piano & Electric Piano
15	Bright Piano
16	Stereo Grand Piano
17	Stereo Extended Piano
18	Bass / Piano 1
19	Bass / Piano 2
20	Piano & Slow Strings
21	Chorused Piano
22	New Age Piano
23	Octave Piano
24	Slow Strings
25	Medium Strings
26	Fast Strings with Release
27	Slow To Fast Strings
28	Hall Strings
29	Synth Strings 1
30	Bell & Strings
31	Flanged Strings
32	Cathedral Choir
33	Choir & Strings
34	Bell & Choir
35	Fluid Vibes
36	Stereo Tremolo Vibes
37	Super Vibes
38	Slow Vibes
39	Vibes & Electric Piano
40	Bowed Acoustic Bass
41	Synth Bass
42	Slap Bass
43	Pipe Organ
44	Dynamic Electric Organ
45	Dynamic Rock Organ
46	Dynamic Jazz Organ
47	Organ w/ Preslie
48	Jazz Organ 2
49	Trumpet Section
50	Analog Brass
51	Handbells
52	Synth Harpsichord 1
53	Synth Kalimba
54	Klavinyet
55	Fat Synth
56	Bells with Echo
57	Chelodes
58	Strhodes
59	Electric Piano 2
60	Digital Electric Piano 2
61	Synth Pizz 1
62	Synth Pizz 2
63	Synth Strings 2
128	Slow Piano
129	Honky Tonk Piano
130	Honky Tonk Piano 2
131	Chain Saw Piano
132	Piano & Vibes
133	Piano & Organ
134	Piano & Harpsichord
135	Piano / Slow Strings
136	Mellow to Bright Strings
137	Octave Strings
138	Mono Pressure Strings
139	Mod Wheel Pan Strings
140	Synth Harpsichord & Strings
141	Synth Brass & Strings
142	Orchestra 1
143	Orchestra 2
144	Octave Choir & Strings
145	Synth Voices
146	Doppler Choir
147	Bright Vibes
148	Pressure Tremolo Vibes
149	Celeste
150	Bright Acoustic Bass
151	Fuzz Bass
152	Heavy Bass
153	Bass / Electric Piano
154	Bass / Vibes
155	Trumpet with Delayed Vibrato
156	Mellow Trumpet
157	Stereo Lead Trumpet
158	Poly Pressure Vibrato Trumpet
159	Clarinet with Delayed Vibrato
160	Mono Pressure Vibrato Clarinet
161	Acclarinet
162	Horn with Delayed Vibrato
163	Baritone Horn & Trumpet
164	Singing Flute
165	Synth Sax
166	Echo Lead
167	Steel Drums
168	Synth Harpsichord 2
169	Synth Marimba
170	Synthichord
171	Saag Synth
172	Synth A
173	Synth B
174	Sample & Hold 1
175	Sample & Hold 2
176	Sample & Hold 3
177	Kraftwork 1
178	Kraftwork 2
179	Alien Piano
180	Klaus
181	Ligeti
182	Suspense
183	Program X
184	Tuning Note

Section VII

1000 GX Guitar Expander

1	Steel String Gtr
2	Acous 12 String
3	Cavern Guitar
4	Processed Steel
5	New Age Acoustic
6	Big Stereo Gtr
7	Nylon String Gtr
8	Hard Atk Nylon (Hard Attack)
9	Nylon & Steel
10	Drifting Nylons
11	Juicy Nylons
12	Watery Nylons
13	Jazz Guitar
14	Mod Wah Jazz Gtr (Mod Wheel wah-wah)
15	Smooth Jazz Gtr
16	Flanged Jazz Gtr
17	Electric Jazz
18	Clean Electric
19	Chorus Elec Gtr
20	Chor Elec Gtr 2
21	Tremolo Guitar
22	Elec 12 String
23	Elec-Acous 12 St
24	24 St Acous-Elec
25	Rock Guitar
26	Mutes
27	Muted Mutes
28	Harmonics
29	Rock->Harm (Harmonics with high Atk Vel)
30	Mute->Rock (Mutes with low Atk Vel)
31	Leslie Rock Gtr
32	Compressed Rock
33	Guitarz
34	Symphonic Guitar
35	Layered Guitars
36	Fuzz Me
37	Press Me Fuzz Me (Fuzz with Pressure)
38	Acoustic Bass
39	Pick Bass
40	Slap Bass
41	Dual E Bass
42	Big Mouth Bass
43	Punchy Bass
44	Monster Bass
45	Synth Bass
46	Synth Fretless
47	Wah Bass
48	Water Bass
49	E Bass/ Rock
50	Dual Bass/ Rock
51	Jazz Duo
52	Electric Duo
53	Funk Duo
54	Digital Rhodes
55	Perc Rhodes
56	Klavier 1
57	Klavier 2
58	Klavinyet
59	Rock Klav
60	Jazz Keys
61	Guitar Keys
62	Synth Harp
63	Auto Chord
128	Chiffy
129	Shimmer
130	Little Ballerina
131	Steel Bells
132	Syn Lead in 5ths
133	Fat Synth
134	Guitar Synth
135	Mutant Synth
136	Synth Synth
137	Synth Horns
138	Vaguely Horns
139	Pseudo Strings
140	"Classy" Strings
141	Sci Fi Guitar
142	Sweep
143	Evolution
144	Slow Guitars
145	Slow Filter
146	Slow Jazz Synth
147	Synth Bassoon
148	Stroboe
149	Synth Sitar
150	Log Drums
151	Ambient Organ
152	Spaceshot Organ
153	Spaceshot Lead
154	Space Delay
155	Space Dulcimer
156	Krellian Music
157	Surf/ Seagulls
158	Choppers
159	Tuning Note

1000 HX Horn Expander

1	Solo Trumpet
2	Trumpet Mutes
3	Solo Trombone
4	Soft Tenor Sax
5	Medium Tenor Sax
6	Growl Tenor Sax
7	Dual Tenor Sax
8	Mellow Trumpet
9	Classic Trombone
10	Trombone with Vibrato
11	Trumpet Mute with Vibrato
12	Stereo Lead Trumpet
13	Trumpet & Mutes
14	Trumpet & Tenor
15	Trumpet & Soft Tenor
16	Trumpet & Bone
17	Trumpet & Dual Tenor
18	Trumpet & Soft Tenor & Mute
19	Trumpet & Dual Tenor & Mute
20	Trombone with Vibrato
21	Mellow Trombone
22	Bone Section 1
23	Bone Section 2
24	Hall Bones
25	Bone & Soft Tenor
26	Bone & Dual Tenor
27	Mellow Medium Tenor
28	Dual Tenor with Vibrato
29	Soft Tenor with Vibrato
30	Hard Attack Soft Tenor
31	Room Soft Tenor
32	Soft & Medium Tenors
33	Bone & 2 Tenors
34	Trumpet & 2 Tenors
35	Sax Trio 1
36	Sax Trio 2
37	Hall Saxes
38	Horns 1
39	Horns 2
40	Brass Section 1
41	Brass Section 2
42	Brass Section 3
43	Brass Section 4
44	Trio Section 1
45	Trio Section 2
46	Trio Section 3
47	Big Band 1
48	Big Band 2
49	Big Band 3
50	Big Band 4
51	Big Band 5
52	Sfz Sax Swells
53	Sfz Bone Swell
54	Sfz Bone Section
55	Sfz Brass Swell
56	Sfz Trio Swell 1
57	Sfz Trio Swell 2
58	Sfz Big Band 1
59	Sfz Big Band 2
60	Sfz Big Band 3
61	Saxobells 1
62	Saxobells 2
63	Digital Layers
128	Bone Section Swell
129	Brass Section Swell
130	Trio Swell 1
131	Trio Swell 2
132	Big Band Swell 1
133	Big Band Swell 2
134	Big Band Swell 3
135	Soft/Med Trombone
136	Bone / Trumpet
137	Trumpet MPress Vibrato
138	Bone PPress Vibrato
139	MPress Section
140	Soft->Medium Sax MW
141	Mute & Bone
142	Mute & Soft Tenor & Bone
143	Mute & Medium Tenor & Bone
144	Mute & 2 Tenors
145	Trio Stab 1
146	Trio Stab 2
147	Big Band Stab 1
148	Big Band Stab 2
149	Big Band Stab 3
150	Stereo Quartet
151	Harpsichord 1
152	Harpsichord 2
153	Harpsichord 3
154	Electric Piano
155	Chorus E Piano
156	E. Piano with Bell
157	Mellow Piano
158	Fluid E Piano 1
159	Fluid E Piano 2
160	Sax E Piano
161	Sax Klav
162	Fluid Klav
163	Klaved Klav
164	Fluty Pipe Organ
165	Slow Hall Tenor
166	Fluid Sax
167	Wet Sax
168	Horn Sweep
169	Synth Horns
170	Analog Synth
171	Mono Press Synth
172	Very Touch Sense
173	Ambient Synth
174	Lead Synth Horn
175	Synth Bass
176	Synthinet
177	Synth Sax
178	Synth Marimba
179	Synth Bassooboe
180	Synth Sitar
181	Bagpipes
182	Close Encounters
183	Program Z
184	Tuning Note

Section VII

1000 SX String Expander

1	Bowed Strings
2	Solo Violin
3	Solo Cello
4	Pizzicato Strings
5	Slow Strings
6	Medium String
7	Bright Strings
8	Mellow Strings
9	Fast Strings with Release
10	Slow to Fast Strings
11	Hall Strings
12	Strings Sloctave
13	Synth Strings
14	Synth Strings
15	Flanged String
16	Violin without Vibrato
17	Violin with Vibrato 2
18	Violin MPress Vibrato
19	Slow Violin
20	Mellow Violin
21	Electric Violin
22	Violin Section
23	Cello without Vibrato
24	Cello with Vibrato 2
25	Cello MPress Vibrato
26	Slow Cello
27	Mellow Cello
28	Solo Strings 1
29	Solo Strings 2
30	Slow Solo Strings 1
31	Slow Solo Strings 2
32	Octave Solo Strings
33	Trio Section 1
34	Trio Section 2
35	String Section
36	String Section
37	Hall Cello/Violin 1
38	Hall Cello/Violin 2
39	Hall Cello/Violin 3
40	Hall Section
41	Hall Section with Vibrato
42	Room Section with Vibrato
43	Strings MWheel -> Reverb
44	Strings MWheel -> Reverb 2
45	Octave Strings
46	Triple Octave Strings
47	MPress Strings
48	MWheel Pan Strings
49	Slow Pan Strings
50	Stereo Strings
51	Hard Attack Strings
52	Hard Attack Hall Strings
53	Pizz & Fast Strings
54	Echo Pizz
55	Analog Strings 1
56	Analog Strings 2
57	Little Mermaid 1
58	Little Mermaid 2
59	Music Box
60	Synth Harpsichord
61	Claved Strings 1
62	Claved Strings 2
63	Breathy Pizz
128	Orchestra Hit 1
129	Orchestra Hit 2
130	Orchestra Hit 3s
131	Strings with Wheslie
132	Doppler Strings
133	Tremolo Strings
134	Synth Fade Strings
135	Breath Fade Strings
136	Strings with Percussion
137	Slow Strings / Violin1
138	Cello / Slow Strings2
139	Slow Strings / Cellos
140	Synth Pizz 1
141	Synth Pizz 2
142	Synth Pizz 3
143	Synth Pizz 4
144	Synth Pizz 5
145	Underwater Pizz
146	Claved Strings 3
147	Claved Strings 4
148	Synth Bass 1
149	Synth Bass 2
150	Elec. Piano
151	Nice Keys
152	Harpsichord 2 Stereo Tremolo
153	Strings with Harpsichord
154	Harmon
155	Squeeze Box 1
156	Squeeze Box 2
157	Generic Synth 1
158	Generic Synth 2
159	Generic Synth 31
160	Ostinato2
161	Newsbreak
162	Killer Bees
163	Tuning Note

1	Grand Piano
2	Fast Strings
3	Choir
4	Vibes
5	Acoustic Bass
6	Trumpet
7	Baritone Horn
8	Clarinet
9	Electric Organ
10	Rock Organ
11	Jazz Organ 1
12	Electric Piano
13	Digital Electric Piano
14	Piano & Electric Piano
15	Bright Piano
16	Stereo Grand Piano
17	Stereo Extended Piano
18	Bass / Piano 1
19	Bass / Piano 2
20	Piano & Slow Strings
21	Chorused Piano
22	New Age Piano
23	Octave Piano
24	Slow Strings
25	Medium Strings
26	Fast Strings with Release
27	Slow To Fast Strings
28	Hall Strings
29	Synth Strings 1
30	Bell & Strings
31	Flanged Strings
32	Cathedral Choir
33	Choir & Strings
34	Bell & Choir
35	Fluid Vibes
36	Stereo Tremolo Vibes
37	Super Vibes
38	Slow Vibes
39	Vibes & Electric Piano
40	Bowed Acoustic Bass
41	Synth Bass
42	Slap Bass
43	Pipe Organ
44	Dynamic Electric Organ
45	Dynamic Rock Organ
46	Dynamic Jazz Organ
47	Organ w/ Wheslie
48	Jazz Organ 2
49	Trumpet Section
50	Analog Brass
51	Handbells
52	Synth Harpsichord 1
53	Synth Kalimba
54	Klavinyet
55	Fat Synth
56	Bells with Echo
57	Chelodes
58	Strhodes
59	Electric Piano 2
60	Digital Electric Piano 2
61	Synth Pizz 1
62	Synth Pizz 2
63	Synth Strings 2
128	Slow Piano
129	Honky Tonk Piano
130	Honky Tonk Piano 2
131	Chain Saw Piano
132	Piano & Organ
133	Piano & Harpsichord
134	Piano / Slow Strings
135	Mellow to Bright Strings
136	Octave Strings
137	Mod Wheel Pan Strings
138	Synth Harpsichord & Strings
139	Synth Brass & Strings
140	Orchestra 1
141	Orchestra 2
142	Octave Choir & Strings
143	Synth Voices
144	Doppler Choir
145	Bright Vibes
146	Celeste
147	Bright Acoustic Bass
148	Fuzz Bass
149	Heavy Bass
150	Bass / Electric Piano
151	Bass / Vibes
152	Trumpet with Delayed Vibrato
153	Mellow Trumpet
154	Stereo Lead Trumpet
155	Clarinet with Delayed Vibrato
156	Acclarinet
157	Horn with Delayed Vibrato
158	Baritone Horn & Trumpet
159	Singing Flute
160	Synth Sax
161	Echo Lead
162	Steel Drums
163	Synth Harpsichord 2
164	Synth Marimba
165	Synthichord
166	Saag Synth
167	Synth A
168	Synth B
169	Sample & Hold 1
170	Sample & Hold 2
171	Sample & Hold 3
172	Kraftwork 1
173	Kraftwork 2
174	Alien Piano
175	Klaus
176	Ligeti
177	Suspense
178	Program X
179	Tuning Note

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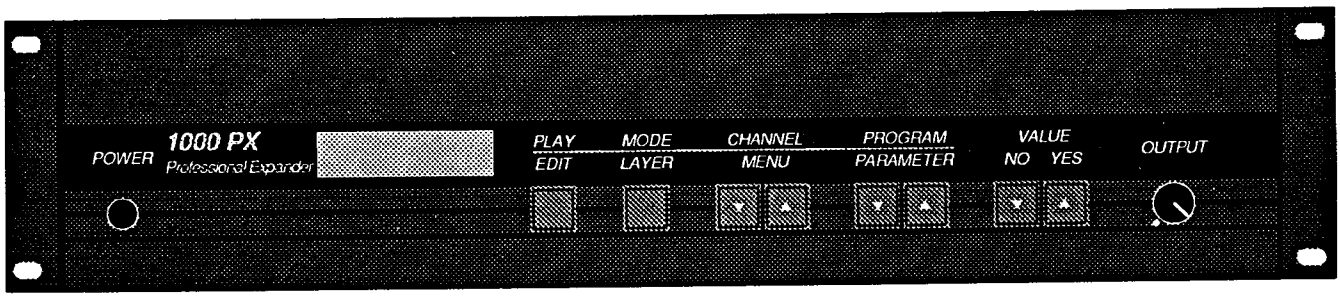
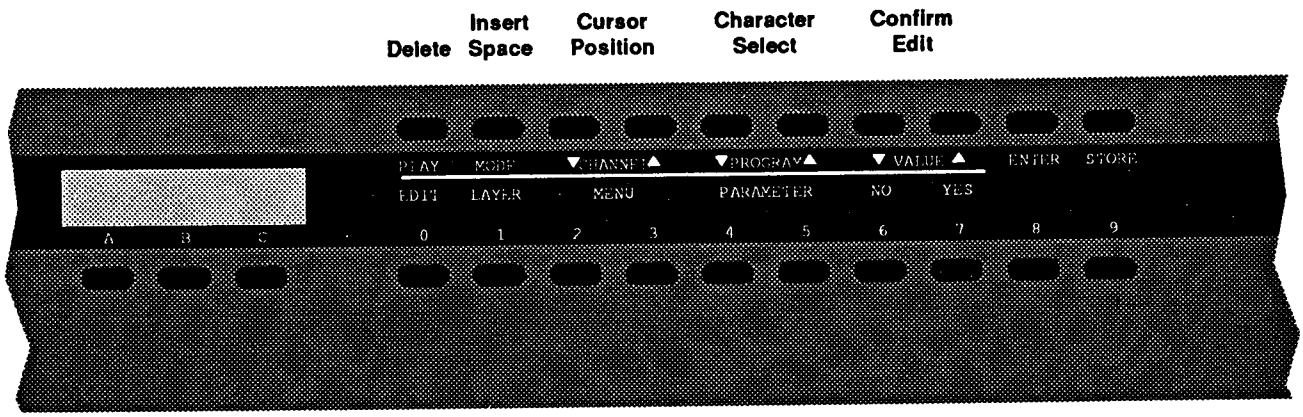
7.2 Functions of Buttons in the Naming Sequence



Delete **Insert Space** **Cursor Position** **Character Select** **Confirm Edit**

1000 Expanders (see *Musician's Guide* pages 24-25)



K1000 Keyboard (see *Musician's Guide* pages 26-27)

7.3 Compiled Effects Parameters

Vibrato

[301]	Maximum Depth
[302]	Maximum Rate
[303]	Shape
[304]	Depth Control
[305]	Rate Control

Delay Vibrato

[301]	Maximum Depth
[302]	Maximum Rate
[303]	Shape
[304]	Delay
[305]	Ramp
[306]	Rate Control

Tremolo

[301]	Maximum Depth
[302]	Maximum Rate
[303]	Shape
[304]	Depth Control
[305]	Rate Control

Delay Tremolo

[301]	Maximum Depth
[302]	Maximum Rate
[303]	Shape
[304]	Delay
[305]	Ramp
[306]	Rate Control

Leslie

[301]	Rate
[302]	Depth
[303]	Ramp
[304]	Trigger

Chorus 2*

[301]	Transpose
[302]	Detune
[303]	Delay
[304]	Enable
[305]	Pan 1
[306]	Pan 2

Tremolo 2*

[301]	Maximum Rate
[302]	Maximum Depth
[303]	Shape
[304]	Rate Control
[305]	Depth Control
[306]	Pan 1
[307]	Pan 2

Vibrato / Chorus 2*

[301]	Maximum Rate
[302]	Maximum Depth
[303]	Shape
[304]	Rate Control
[305]	Depth Control
[306]	Transpose
[307]	Detune
[308]	Delay
[309]	Enable
[310]	Pan 1
[311]	Pan 2

Phaser 2*

[301]	Maximum Rate
[302]	Depth
[303]	Ramp
[304]	Shape
[305]	Rate Control
[306]	Detune
[307]	Delay
[308]	Pan 1
[309]	Pan 2

Leslie 2*

[301]	Rate
[302]	Depth
[303]	Ramp
[304]	Trigger
[305]	Pan 1
[306]	Pan 2

Chorus 3*

[301]	Transpose
[302]	Detune
[303]	Delay
[304]	Enable
[305]	Pan 1
[306]	Pan 2
[307]	Pan 3

Echo 3*

[301]	Delay
[302]	Decay
[303]	Enable
[304]	Pan 1
[305]	Pan 2
[306]	Pan 3

*Uses additional "invisible" Layers.

Section VII

7.4 1000 Series Control Source List

Name	Display	Config	Type
Off	OFF	Logical	Global
On	ON	Logical	Global
None	None	—	—
Modulation Wheel (MIDI 01)	M Wheel	Unipolar	Global
Breath Controller (MIDI 02)	Breath		
MIDI 03	MIDI 03		
Foot Switch (MIDI 04)	Foot		
Portamento Time (MIDI 05)	PortTim		
Data Entry (MIDI 06)	Data		
Volume (MIDI 07)	Volume		
Balance (MIDI 08)	Balance		
MIDI 09	MIDI 09		
Stereo Pan (MIDI 10)	Pan		
Expression (MIDI 11)	Express		
MIDI 12	MIDI 12		
MIDI 13	MIDI 13		
MIDI 14	MIDI 14		
MIDI 15	MIDI 15		
Performance Control A (MIDI 16)	Ctl A		
Performance Control B (MIDI 17)	Ctl B		
Performance Control C (MIDI 18)	Ctl C		
Performance Control D (MIDI 19)	Ctl D		
MIDI 20	MIDI 20		
MIDI 21	MIDI 21		
MIDI 22	MIDI 22		
MIDI 23	MIDI 23		
MIDI 24	MIDI 24		
MIDI 25	MIDI 25		
MIDI 26	MIDI 26		
MIDI 27	MIDI 27		
MIDI 28	MIDI 28		
MIDI 29	MIDI 29		
MIDI 30	MIDI 30		
MIDI 31	MIDI 31		
Sustain Pedal (MIDI 64)	Sustain		
Portamento Switch (MIDI 65)	Port Sw		
Sostenuto Pedal (MIDI 66)	Sost Pd		
Soft Pedal (MIDI 67)	Soft Pd		
MIDI 68	MIDI 68		
Freeze Pedal (MIDI 69)	Frez Pd		
MIDI 70	MIDI 70		
MIDI 71	MIDI 71		
MIDI 72	MIDI 72		
MIDI 73	MIDI 73		
MIDI 74	MIDI 74		
MIDI 75	MIDI 75		
MIDI 76	MIDI 76		
MIDI 77	MIDI 77		

Name	Display	Config	Type
MIDI 78	MIDI 78	Unipolar	Global
MIDI 79	MIDI 79		
Performance Control E (MIDI 80)	Ctl E		
Performance Control F (MIDI 81)	Ctl F		
Performance Control G (MIDI 82)	Ctl G		
Performance Control H (MIDI 83)	Ctl H		
MIDI 84	MIDI 84		
MIDI 85	MIDI 85		
MIDI 86	MIDI 86		
MIDI 87	MIDI 87		
MIDI 88	MIDI 88		
MIDI 89	MIDI 89		
MIDI 90	MIDI 90		
MIDI 91	MIDI 91		
MIDI 92	MIDI 92		
MIDI 93	MIDI 93		
MIDI 94	MIDI 94		
MIDI 95	MIDI 95		
Pitch Wheel	P Wheel	Bipolar	Global
Monophonic Afterpressure	M Press	Unipolar	Global
Poylphonic Afterpressure	P Press	Unipolar	Local
Attack Velocity	Att Vel	Unipolar	Local
Release Velocity	Rel Vel	Unipolar	Local
Note State	Note St	Logical	Local
Key State	Key St	Logical	Local
Key Number	Key Num	Unipolar	Local
Local LFO 1 Output	LFO1	Bipolar	Local
Local LFO2 Output	LFO2	Bipolar	Local
Global LFO1 Output	gLFO1	Bipolar	Global
Global LFO2 Output	gLFO2	Bipolar	Global
Local ASR1 Output	ASR1	Unipolar	Local
Local ASR2 Output	ASR2	Unipolar	Local
Global ASR1 Output	gASR1	Unipolar	Global
Global ASR2 Output	gASR2	Unipolar	Global
Mixer 1 Output	MXR1	Bipolar	Local
Mixer 2 Output	MXR2		
Inverter 1 Output	INV1		
Inverter 2 Output	INV2		
Negator 1 Output	NEG1		
Negator 2 Output	NEG2		
Amplitude Envelope	Amp ENV	Unipolar	Local
Envelope 2	ENV2	Bipolar	Local
Velocity Trigger 1	VTrig1	Logical	Local
Velocity Trigger 2	VTrig2	Logical	Local
Inverted Attack Velocity	InvAVel	Unipolar	Local
Inverted Release Velocity	InvRVel	Unipolar	Local
Playback Rate	PB Rate	Unipolar	Local

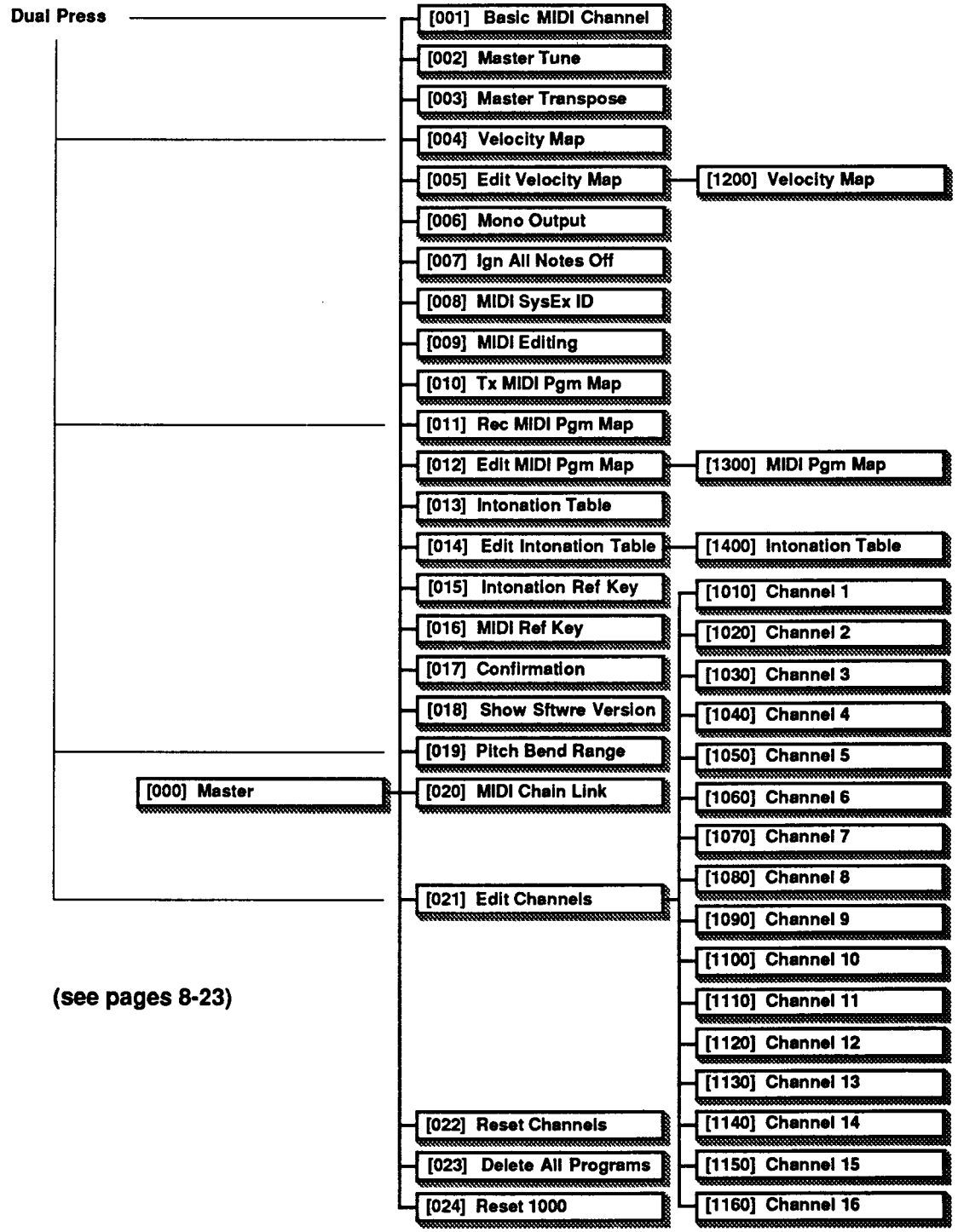
Section VII

7.5 Standardized MIDI Control Destinations

MIDI #	Name	1000 Display
01	Modulation Wheel	M Wheel
02	Breath Controller	Breath
04	Foot Controller	Foot
05	Portamento Time	PortTim
06	Data Entry	Data
07	Volume	Volume
08	Balance	Balance
10	Pan	Pan
11	Expression	Express
16	Performance A	Ctl A
17	Performance B	Ctl B
18	Performance C	Ctl C
19	Performance D	Ctl D
64	Sustain Pedal	Sustain
65	Portamento Switch	Port Sw
66	Sostenuto Pedal	Sost Pd
67	Soft Pedal	Soft Pd
69	Freeze Pedal	Frez Pd
80	Performance E	Ctl E
81	Performance F	Ctl F
82	Performance G	Ctl G
83	Performance H	Ctl H

The MIDI Control Sources listed above are standardized in the MIDI 1.0 Specification. Most manufacturers of MIDI equipment acknowledge these standards, and program their products according to the functions indicated by the names of these Control destinations. For further information regarding the MIDI implementation for equipment that you wish to use with your 1000, consult the manufacturer's documentation.

7.6 The Master Menu



(see pages 8-23)

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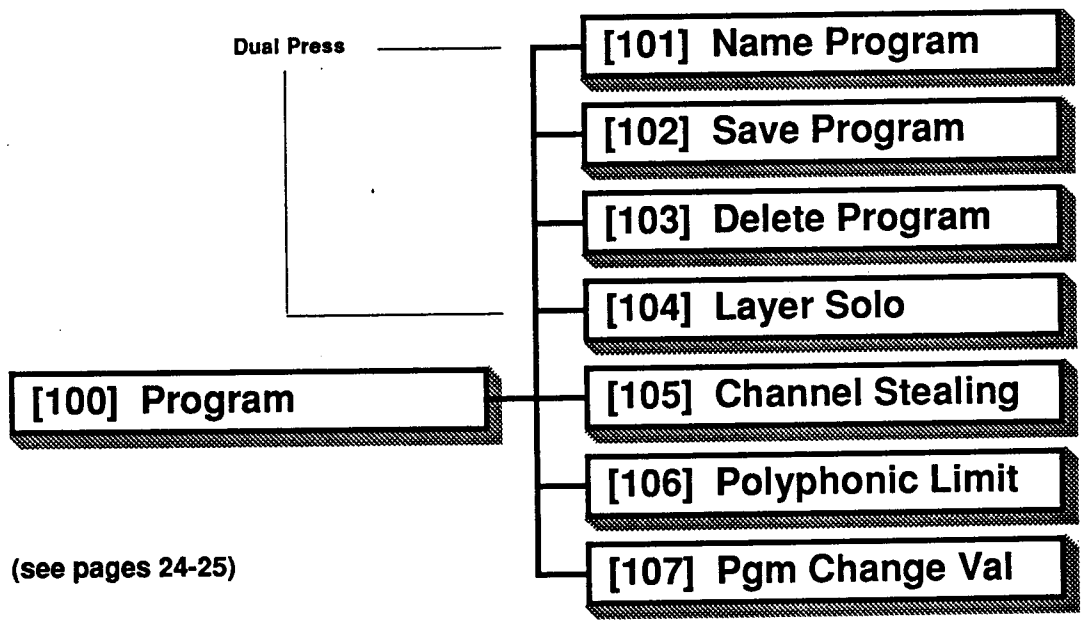
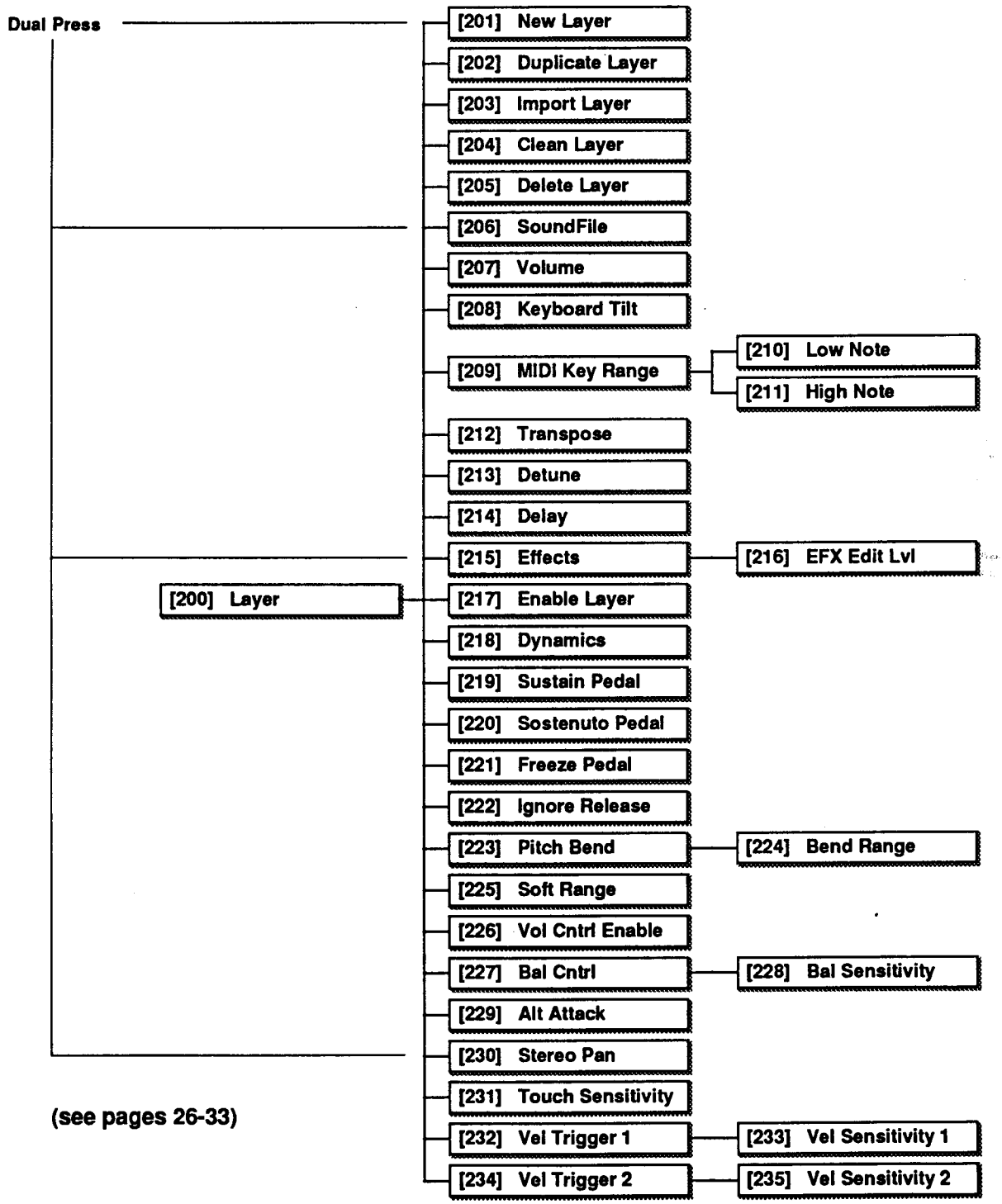
7.7 The Program Menu



(see pages 24-25)

7.8 The Layer Menu



(see pages 26-33)

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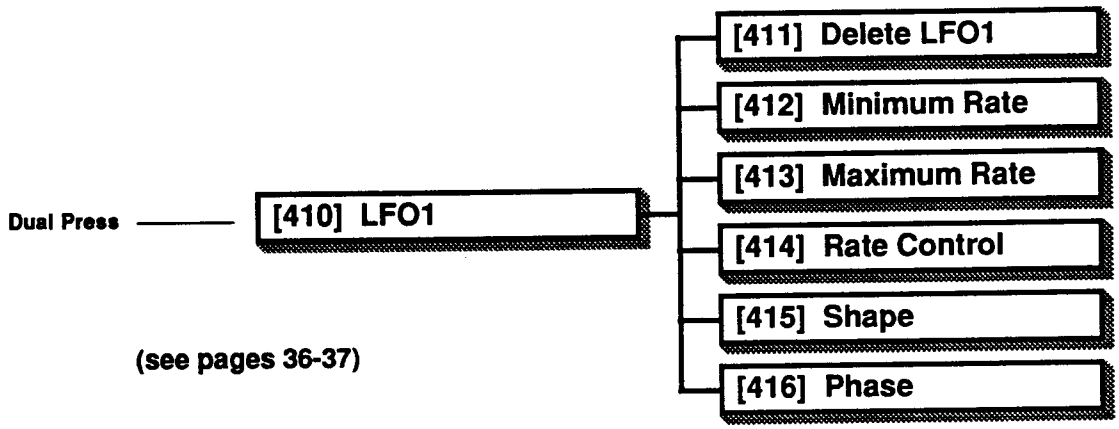
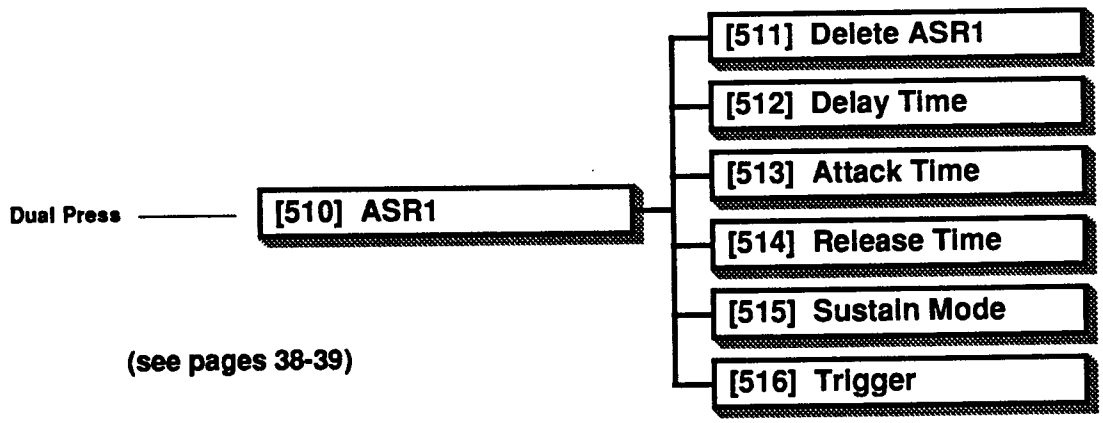
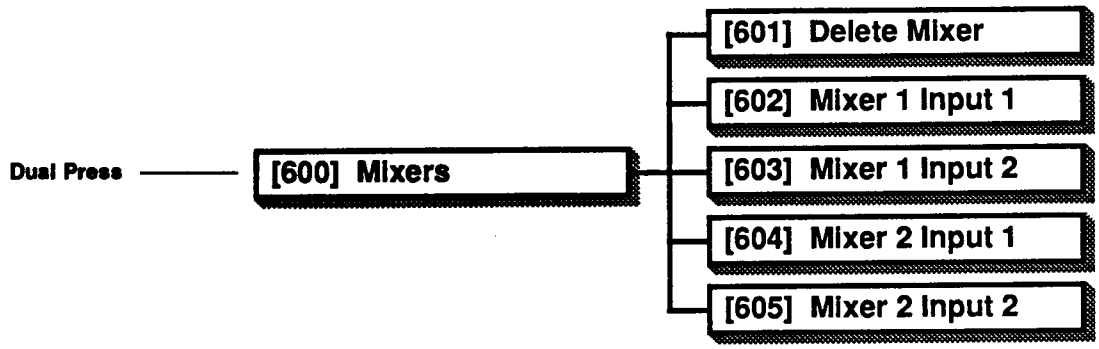
7.9 Modular Effects Menus



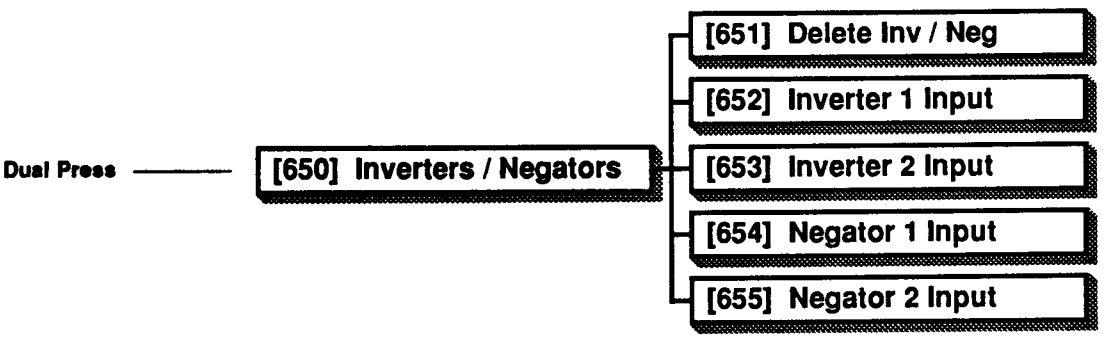
(see pages 36-37)



(see pages 38-39)



(see page 40)



(see page 41)

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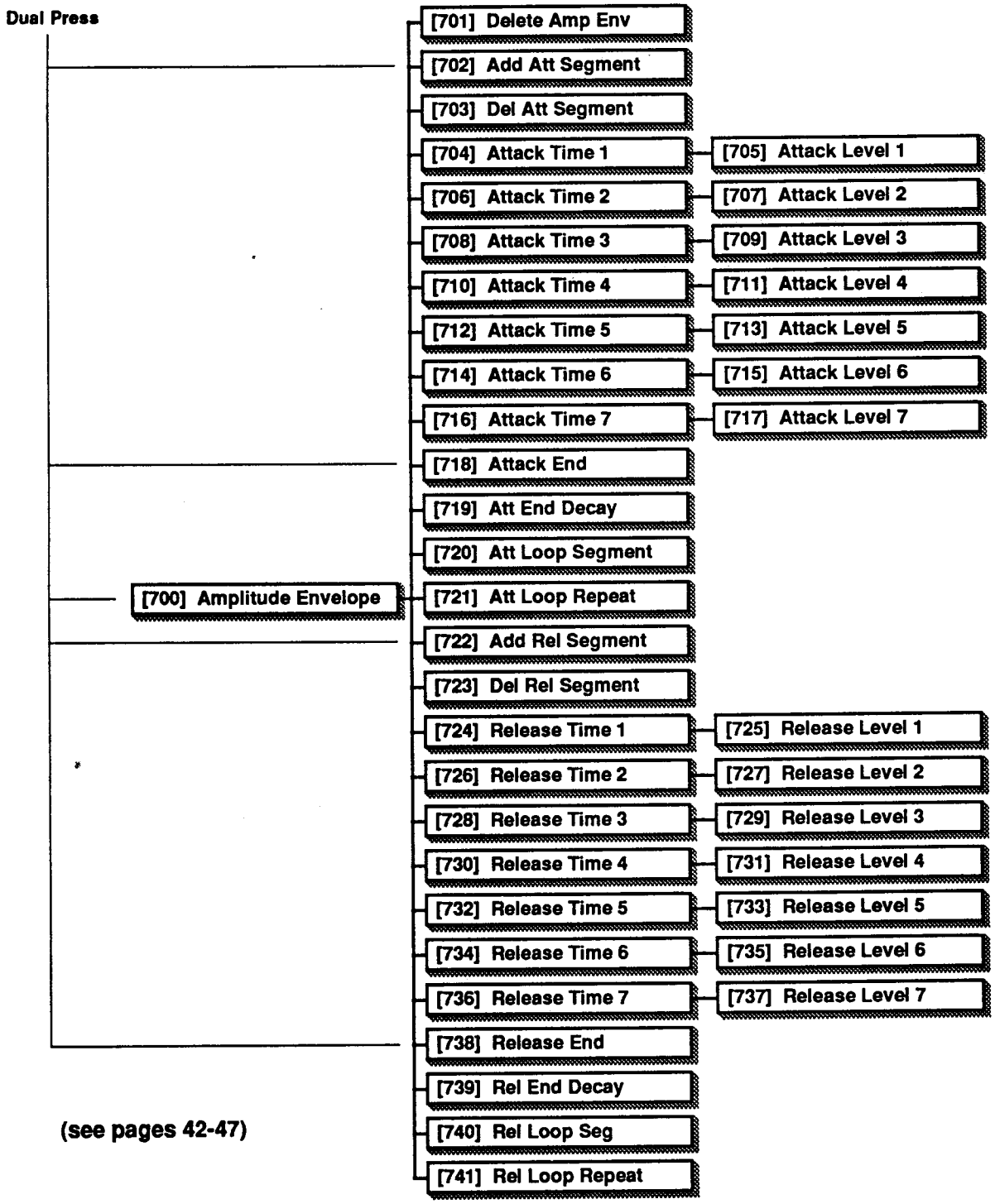
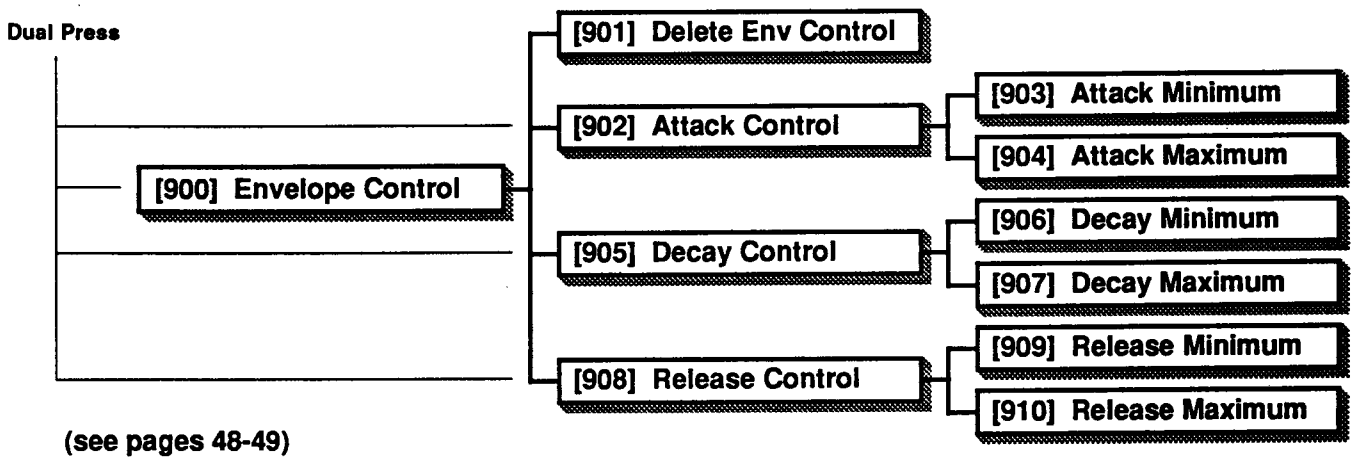
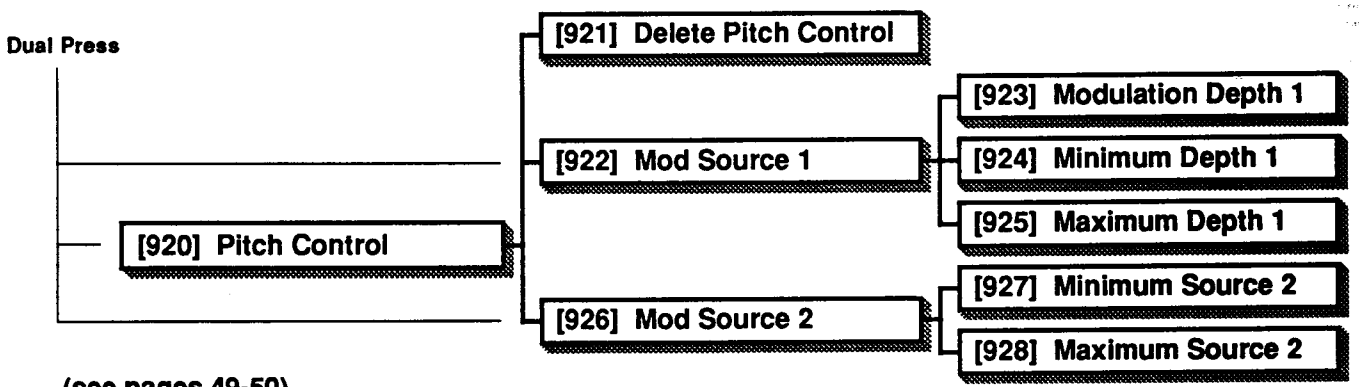


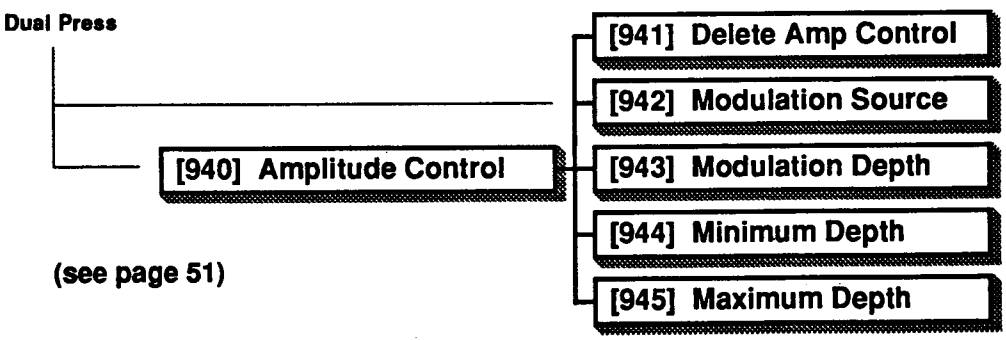
(see pages 42-47)



(see pages 48-49)



(see pages 49-50)



(see page 51)

Section VIII
APPENDIX

8.1 Value Resolutions

8.1.1 Time Values

In the 1000 Series Edit Menus, time is expressed in seconds, with a normal maximum resolution (amount of increase or decrease in Value with each button stroke) of 0.01 s. Time Values range from a minimum of 0.00 s to a maximum of 10.00 s.

As you scroll through the range of Values for a time-oriented Parameter, you will notice that the resolution *decreases* as the Value *increases*. By adjusting the minimum time increment upward as the Value increases, the 1000's software assures that, in each time range, you will be stepping by a perceptually significant increment. This feature speeds the editing process.

Figure 8-1 illustrates the 1000 Series' normal editing resolution for each time Value range.

Layer Delay — Parameter 214 (Layer Delay) is the only Parameter in the 1000 that allows greater than normal resolution over its entire range: the maximum resolution for Parameter 214 is one millisecond (0.001 s).

Kurzweil's software engineers have provided finer resolution for Layer Delay because it is the sole time-oriented Parameter for which very fine increments in Value can have a significant audible effect. Layer Delays may be used to produce a variety of effects, from chorusing (small delay Values) to strumming and echo effects (larger delay Values).

The resolution at various ranges for Parameter 214 is shown in Figure 8-2.

8.1.2 Rate Values

Rates are expressed in Hertz (cycles per second). As with Time Values, Rate Values have different resolutions in different ranges. Figure 8-3 illustrates the 1000 Series' normal editing resolution for each rate (frequency) Value range.

Range	Resolution
0.00 – 1.00 s	.01 s
1.00 – 2.00 s	.02 s
2.00 – 5.00 s	.05 s
5.00 – 9.00 s	.10 s
9.00 – 10.00 s	.20 s

Figure 8-1 Time Value Resolution For Various Ranges

Range	Resolution
0.000 – 0.050 s	.001 s
0.050 – 0.100 s	.002 s
0.100 – 0.200 s	.005 s
0.200 – 0.500 s	.010 s
0.500 – 1.000 s	.020 s
1.000 – 2.000 s	.050 s
2.000 – 10.000 s	.100 s

Figure 8-2 Layer Delay Time Value Resolution

Range	Resolution
0.00 – 0.20 Hz	.01 Hz
0.20 – 1.00 Hz	.05 Hz
1.00 – 10.00 Hz	.10 Hz
10.00 – 20.00 Hz	.20 Hz
20.00 – 50.00 Hz	.50 Hz

Figure 8-3 Rate Value Resolution For Various Ranges

8.2 Self-Diagnostics

The Kurzweil 1000 Series software includes a set of diagnostic routines which you can run yourself. If you suspect a malfunction in your 1000, you can use these diagnostics to help determine whether the unit needs to be serviced.

8.2.1 1000 Series Expanders

To enter self-diagnostic mode, first turn the Expander off. Hold down both of the PROGRAM/PARAMETER buttons, and turn the unit back on.

Important — Set the OUTPUT knob to minimum. The Sound ROM Test generates full-volume waveforms which may damage your audio system.

The display will briefly show:

```
KURZWEIL 1000
TEST SUPERVISOR
```

and then will read:

```
XTEST MAIN MENU
>RUN ALL TESTS
```

Press the CHANNEL/MENU UP button, and the display will respond:

```
XTEST MAIN MENU
>RUN SELF TESTS
```

Press YES, and the display will read:

```
NUMBER OF PASSES
>001
```

Press YES to begin the test sequence.

The display will identify each test while it is running, as follows:

```
Program ROM Test
Setup ROM Test
RAM Test
Battery Backup Test
Arnold 1 Test
Arnold 0 Test
Sound ROM Test
One Sample Test
```

When the Expander has completed the self-test sequence, the display should read:

```
PASSES>00001
ERRORS>00000
```

If the display shows anything other than 00000 for the number of errors, call Kurzweil Music Systems at (617) 893-5900 and ask for the Service Department.

After displaying the tests results, the Expander will return to the ">RUN ALL TESTS" display. Press CHANNEL/MENU DOWN, and the display will read:

```
XTEST MAIN MENU
>EXIT SUPERVISOR
```

Press YES, and the Expander will return to Play Mode.

8.2.2 K1000 Keyboard

To enter self-diagnostic mode, first turn the K1000 off. Connect a MIDI cable from the MIDI Out port to the MIDI In port. Then, hold down the C and PLAY/EDIT buttons while you turn the unit back on.

Important — Set the VOLUME slider to minimum. The Sound ROM Test generates full-volume waveforms which may damage your audio system.

The display will briefly show:

```
KURZWEIL 1000
TEST SUPERVISOR
```

and then will read:

```
XTEST MAIN MENU
>RUN ALL TESTS
```

Press the "8" numeric button, and the display will respond:

```
XTEST MAIN MENU
>RUN SELF TESTS
```

Press the "3" numeric button, and the display will read:

```
NUMBER OF PASSES
>001
```

Press "3" again to begin the test sequence.

The display will identify each test while it is running.

Section VIII

The K1000 self tests are:

Program ROM Test
Setup ROM Test
RAM Test
Battery Backup Test
Timer Test
UART Test
VLSI 1 Test
VLSI 2 Test
Sound ROM Test
One Sample Test

When the K1000 has completed the self-test sequence, the display should read:

PASSES>00001
ERRORS>00000

If the display shows anything other than 00000 for the number of errors, call Kurzweil Music Systems at (617) 893-5900 and ask for the Service Department.

Note — If you do not make the MIDI cable connection loop described above, the K1000 will register one test failure, and will generate an error message. The error display will last last only a few seconds, after which the K1000 will display:

FAILED TESTS
>UART FAIL

This does not indicate a malfunction.

After displaying the tests results, the K1000 will return to the ">RUN ALL TESTS" display. Press the "7" numeric button, and the display will read:

XTEST MAIN MENU
>EXIT SUPERVISOR

Press "3" and the K1000 will return to Play Mode.

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