

Kurzweil PC2

Musician's Guide

K U R Z W E I L
Music Systems

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

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

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2. Do not use this product near water - for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.
3. This product should be used only with a stand or cart that is recommended by the manufacturer.
4. This product, either alone or in combination with an amplifier and speakers or headphones, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
5. The product should be located so that its location or position does not interfere with its proper ventilation.
6. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.
7. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.
8. This product may be equipped with a polarized line plug (one blade wider than the other). This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace your obsolete outlet. Do not defeat the safety purpose of the plug.

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 - B. Objects have fallen, or liquid has been spilled into the product;
 - C. The product has been exposed to rain;
 - D. The product does not appear to be operating normally or exhibits a marked change in performance;
 - E. The product has been dropped, or the enclosure damaged.
12. Do not attempt to service the product beyond that described in the user maintenance instructions. All other servicing should be referred to qualified service personnel.
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WARNING: Changes or modifications to this instrument not expressly approved by Young Chang could void your authority to operate the instrument.

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NOTICE

This apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

AVIS

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la class A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

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Chapter 1

Introduction

Thanks for buying your PC2 MIDI performance controller! It combines 16 megabytes of renowned Kurzweil ROM sounds with an extensive set of flexible and easy-to-use performance and MIDI-control features—all in a portable keyboard that can help you sound like a pro on stage or in the studio. We hope you like it.

Basic PC2 Features

The Sound

The PC2 offers 64-voice polyphony that's expandable to 128 voices. For maximum flexibility in connecting to sound systems and processing or recording equipment, the PC2 provides analog and digital audio outputs, which you can use simultaneously.

There are 128 factory programs, including Kurzweil's new stereo triple-strike Grand Piano, Rhodes and Wurlitzer electric pianos, stereo strings, brass, and Take 6 vocal samples—as well as our critically-acclaimed keyboard, guitar, bass, drums, and percussion sounds. There's also room for two Sound ROM Option cards, for up to 48 megabytes of ROM sounds.

Setups make the PC2 a versatile performance instrument and MIDI control keyboard. Each setup contains four zones that can cover any part of the keyboard, or overlap across the entire keyboard. You can program each zone independently—with different programs, physical controller assignments, and MIDI channels for each zone. Using the onboard arpeggiator, you can program setups with grooves that start automatically and evolve in countless variations as you play.

For serious Hammond organ fans we offer KB3 Mode, which uses tone-wheel synthesis to provide superb recreations of the classic B-3 sound—including real-time drawbar controls and multi-effects settings that include all of the essential features of a Hammond-Leslie setup—percussion, key click, chorus and vibrato, tube amp distortion, and rotary speakers with programmable speed control that ramps up and down like the real thing. You can play KB3 programs by themselves or with other programs in setups.

Keyboard and Controllers

There are two PC2 models. Both have the same features, with only one exception. The PC2X has a fully-weighted 88-key piano action, while the standard PC2 has a 76-key lightly-weighted action for the perfect combination of power and portability. Both models have mono pressure (aftertouch), and have programmable velocity sensitivity. (By the way, whenever we mention the PC2 by name, we're referring to both models.)

You'll find the usual array of physical controllers—Pitch Wheel, Mod Wheel, jacks for continuous and switch pedal jacks, and a breath-controller jack—as well as multi-function front-panel buttons and sliders, and a unique ribbon controller. They're all fully programmable.

There's an extensive list of programmable features for MIDI control—the PC2 isn't just a great-sounding performance keyboard; it's a serious tool for MIDI sequencing, and makes an excellent

centerpiece for sophisticated MIDI studios. The PC2 is also well-equipped to receive MIDI from other instruments or external MIDI sources like computer-based sequencers.

Effects

To complement the ROM sounds, there are over 150 multiple effects and 30 reverbs. You can apply the effects to programs or setups, and you can easily control the wet/dry mix in real time. You can also program the multi-effects and reverbs for even more control in performance and recording.

Options

Ask your Kurzweil dealer about the following PC2 options:

Sound ROM Cards

The PC2 has sockets for two ROM expansion cards that you can install yourself (the expansion kits come with complete instructions). Each expansion card adds 16 megabytes of ROM sounds to the 16 megabytes of onboard ROM.

Polyphony Expansion Board

There's a kit for expanding your PC2's polyphony from 64 voices to 128 voices. You can install this kit yourself as well.

Pedals

The PC2 has jacks for three switch pedals (for functions like sustain or program/setup changes) and two continuous pedals (for functions like volume control). Your Kurzweil dealer stocks the following optional pedals:

FS-1	Standard box-shaped switch pedal
KFP-1	Single piano-style switch pedal
KFP-2M	Double piano-style switch pedal unit
CC-1	Continuous pedal

Ribbon Controller

There's a dedicated modular jack (like a telephone jack) on the rear panel for connecting this 600-mm (24-inch) ribbon controller. You can configure the PC2 to use the ribbon as a single large controller, or a three-section controller with independent settings for each section.

Music Rack

The sturdy acrylic music rack (model PC-MDS) fits into a bracket that you attach to the PC2's rear panel. You'll find installation instructions on page 2-1.

Breath Controller

You can plug a Yamaha (or equivalent) breath controller into the dedicated jack on the PC2's rear panel (your Kurzweil dealer won't necessarily have these in stock).

Unpacking your PC2

Your PC2 carton should contain the following:

- PC2 or PC2X Performance Controller
- Power adapter
- Piano-style switch pedal
- Four adhesive-backed rubber feet
- This manual
- Warranty card

You might want to keep the PC2 carton and packing materials for easy shipping or transport.

Chapter 2

Startup

Setup

When setting up the PC2 for use it must be placed on a sturdy, level surface where both ends of the unit are supported. A conventional keyboard stand may be used if it is strong enough to support the unit's weight (about 35 pounds for a PC2, 50 for a PC2X). If you are going to be using the unit on a table now or in the future, apply the four stick-on rubber feet to the bottom. Figure 2-1 shows the recommended locations marked with pairs of small guide holes. Remove the backing paper from each rubber foot and attach just forward of each set of guide holes. It is possible that these locations could interfere with some keyboard stand's supports, so check how the PC2 fits on your stand before applying the rubber feet.

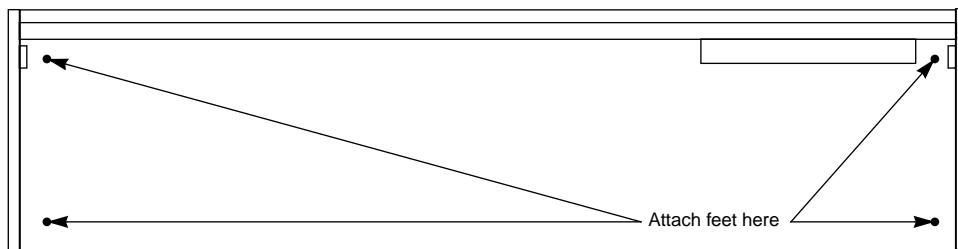


Figure 2-1 Attaching rubber feet

Installing the Music Rack

You'll need a Phillips screwdriver to install the optional music rack.

1. Remove the four screws on the rear panel of the PC2, as shown in Figure 2-2.
2. Use the screws to attach the music rack bracket, making sure that the rounded edge of the bracket is at the top.
3. Slide the music rack in from the top (as shown in the figure).

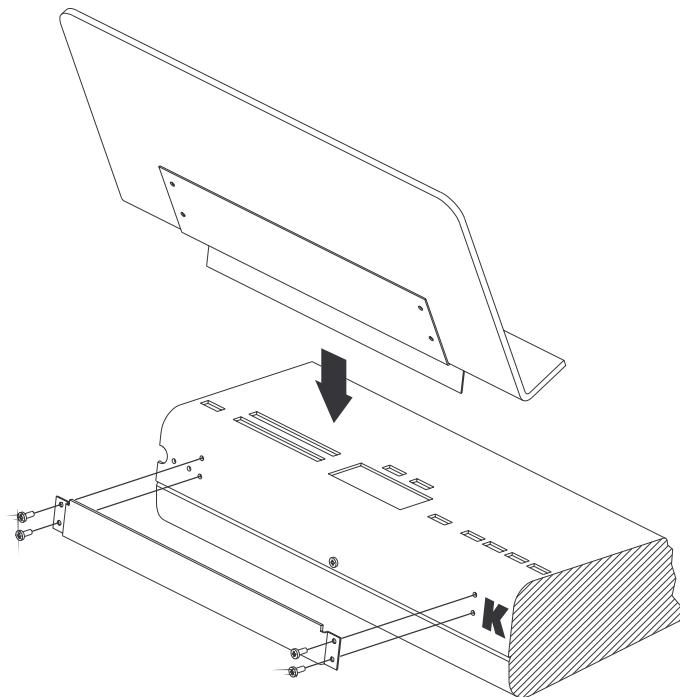


Figure 2-2 **Installing the music rack**

Basic Connections

Power

The PC2 has an external transformer/power supply with a standard electrical plug on one end, and a keyed four-pin plug that connects with the PC2 (keyed means that there's only one way to connect it). This is a specialized power supply, and is not interchangeable with other power supplies.



***Caution:** Use only the power supply that comes with your PC2, or a replacement purchased from an authorized Kurzweil dealer. Using a different power supply can seriously damage your PC2!*

Before connecting the power supply, make sure your PC2 is off (push the side of the power switch that's marked with a circle). Connect the keyed plug to the AC In connector. Figure 2-3 shows the correct orientation of the plug.

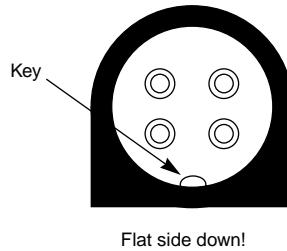


Figure 2-3 Proper orientation of plug

Place the power supply somewhere where it will stay dry and out of the way. We recommend keeping it on the floor. Never cover the power supply with anything; it needs adequate ventilation to prevent overheating.

Connect the plug at the other end of the power-supply cable into a standard power outlet. If you plan to take your PC2 to a location that uses a different voltage level, you'll need to get an additional power supply that's compatible with the local voltage.

Audio

The PC2 features balanced left and right analog audio outputs with $1/4$ -inch jacks. For best results, use balanced cables to connect to balanced, line-level inputs on your mixer or sound system.

It's important to use shielded, twisted-pair cables. The cables should each have $1/4$ -inch stereo (tip-ring-sleeve) plugs on one end to connect to the PC2. The other end of each cable should have either $1/4$ -inch stereo plugs or XLR plugs. Cables of this type provide balanced operation, which greatly reduces many types of noise. Unbalanced cables or sound-system inputs won't give you quite the same audio quality.

For best performance, set the PC2's Master Volume slider to its maximum when adjusting mixer or sound-system levels. Otherwise, if you adjust the PC2's level by increasing the level of your sound system, you'll increase the noise level.

If you're using a monaural sound system or running the PC2's audio into a single mixer channel, we recommend configuring the PC2 for mono output, in which case the PC2 sends the same one-channel signal to the left and right sides of both the analog and digital outputs. See page 4-26 for information about using mono audio output mode.

The PC2 has a headphone jack, which carries the same signal as the main outputs (that's true whether you're using stereo *or* mono output). The headphone jack accepts a standard $1/4$ -inch stereo plug, and is compatible with nearly all types of headphones. Plugging into the headphones jack does *not* mute the other audio outputs.

You can also use the headphone jack as an unbalanced stereo line-level output. Just connect a stereo cable from the headphone jack to a stereo input on your mixer or sound system. If you have only unbalanced inputs to your sound system, you'll get better audio quality using the headphone jack.

There's also an RCA digital audio jack, which you can use in addition to the analog outputs. See page 2-6 for more information.

MIDI

The PC2 both transmits and accepts most standard (and several specialized) MIDI messages. In other words, it can serve as both a MIDI master and a MIDI slave.

Using the PC2 as a MIDI Master

Connect a MIDI cable from the MIDI Out port of the PC2 to the MIDI In port of the device you want to control—another MIDI musical instrument, or any device that accepts MIDI, such as a computer with a MIDI interface or an integrated MIDI In port. This makes the PC2 a MIDI control device, and you can use it to play other instruments, make recordings using sequencers, or send MIDI System Exclusive (SysEx) messages for storing programs, setups, and effects settings externally.

When the PC2 is the MIDI master, you can configure it to control only its slaves, or to play its own sounds in addition to controlling the slaves.

Using the PC2 as a MIDI Slave

Connect a MIDI cable from the MIDI Out port of the instrument or device that you’re using as the MIDI master to the MIDI In port of the PC2. This makes the PC2 a MIDI slave, enabling you to play its sounds from any MIDI instrument—keyboard, wind controller, drum pads, whatever—or to control it via MIDI devices like dedicated sequencers or computers running sequencing applications. The PC2 can receive 16 independent channels of MIDI information.

MIDI Out/Thru

This jack has two functions: it can be a MIDI Out port, enabling you to send directly to two different slaves, or it can be a MIDI Thru port, in which case it passes along whatever MIDI information that the PC2 receives at its MIDI In port (but *not* the MIDI information that the PC2 itself generates). This makes it easy to include the PC2 in a chain of multiple MIDI devices, which is a common configuration when you’re using a computer for sequencing.

There’s a small switch labeled Thru/Out on the PC2’s rear panel (as you face the rear panel, the switch is to the left of the MIDI In port). Use a small pointed object to set the switch to the position you want—a ball-point pen works nicely.

Pedals

Plug your switch or continuous pedals into the corresponding jacks on the PC2’s rear panel. We recommend using the Kurzweil pedals described on page 1-2, but you can use almost any switch or continuous pedal, as long as it adheres to the following specifications (as most pedals do):

Switch pedals	1/4-inch tip-sleeve plug
Continuous pedals	10-kOhm linear-taper potentiometer, 1/4-inch tip-ring-sleeve plug

If you use a third-party (non-Kurzweil) switch pedal, make sure it’s connected before you turn on your PC2. This ensures that the pedal will work properly (it might function backward—off when it’s down and on when it’s up—if you turn on your PC2 before plugging in the pedal). Similarly, don’t press any of your switch pedals while powering up, because the PC2 verifies each pedal’s orientation during power up. If you’re pressing a pedal, you might cause it to work backward.

The pedals are independently programmable within each zone of every setup. Here are the default settings for the five pedals you can use with the PC2:

Switch Pedal 1	Controller 64 (Sustain)
Switch Pedal 2	Controller 66 (Sostenuto)
Switch Pedal 3	Controller 67 (Soft)
Continuous Control Pedal 1	Controller 11 (Expression)
Continuous Control Pedal 2	Controller 4 (Foot Pedal)

Breath

The 3.5mm Breath jack labeled Breath accepts a standard breath controller, which sends standard MIDI Breath (MIDI 2) messages. The PC2's preset programs and setups don't respond to breath, but if you have other instruments that *do* respond to Breath, you can control them from the PC2 via MIDI.

You can also program the PC2 so that the breath controller sends a different MIDI message. This would enable you to use a breath controller to affect the PC2, but then other instruments receiving MIDI from the PC2 would no longer respond to the PC2's breath controller (unless you also programmed them to receive the same MIDI Controller that the PC2's breath controller is sending).

Ribbon

Connect the optional Kurzweil Ribbon Controller into the modular Ribbon jack on the rear panel. The ribbon controller itself should rest on a flat surface; it fits nicely between the keys and the buttons and sliders on the front panel.

The ribbon is a continuous controller. You can program the ribbon controller to send MIDI Controller messages 1–127, as well as several specialized messages. It generates values of 0–127 for whatever MIDI Controllers you assign it to send. Just press it, and slide your finger along the ribbon to change the value of the message it's sending.

You can configure the ribbon to have one control section that runs its entire length, or to have three sections of equal length. It sends its highest values when you press it at the end where the cable connects. When you configure it to have three sections, each section sends its highest values at the end closest to the cable.

The ribbon controller comes with an adhesive-backed foam strip and Velcro® fastener pads. The foam strip will hold it in place under most circumstances, but you might find it more convenient to attach it more securely with the Velcro fasteners. In that case, we recommend sticking the hook side of each pad to the underside of the Ribbon and the loop (softer) side to the keyboard. This helps to prevent the hooks in the Velcro from collecting crud when you don't have the ribbon attached.

 ***Caution: The modular jack is designed for connection to the Kurzweil Ribbon Controller option only. Don't plug any other modular plugs into the Ribbon jack.***

Digital Output

With the PC2, you can take advantage of the growing number of digital recorders and mixers on the market. Connect a 75-Ohm coaxial cable from the PC2's RCA Digital Out jack to the AES or S/PDIF input of the receiving device. You may need an RCA-to-XLR adapter to connect with the receiving device. If the receiving device receives only optical signals, you'll need a converter as well.

Powering Up

When you've made all your connections, turn on the PC2 by pushing the side of the power switch marked with the vertical line. All of the lights on the front panel flash, and the liquid-crystal display (LCD) shows a series of messages. When the PC2 is ready to play, the display looks like this:

Bank:0 Internal 1A
000 Stereo Grand

Before playing, we recommend that you slide the volume control nearly to the bottom and gradually push the control up while playing the keyboard. This way you won't cause any pain or damage if there's too much gain in your sound system.

Display (LCD)

The PC2's 40-character liquid-crystal display tells you what's going on, whether you're playing or editing. Depending on your viewing angle (and possibly the temperature), you may need to adjust the **contrast** for better visibility. There's a small black knob on the rear panel, between the MIDI ports and the Digital Out jack. Use a screwdriver or your fingertips to turn the knob until you can read the display easily.

LEDs

Most of the buttons on the PC2's front panel contain light-emitting diodes that indicate the status of the features that the buttons control. They should all flash red three times as the PC2 starts up.

Software Upgrades

The PC2 contains a type of reloadable computer memory called Flash ROM, which makes software upgrades fast and easy. You can learn about new features from your Kurzweil dealer, or from our website (www.youngchang.com/kurzweil). See *Boot Block* on page A-3 for software-installation instructions.

Playing the Demo Sequences

1. Press Sound Select buttons **14** and **16 (Bass and Percussion)** simultaneously to enter Demo mode. Sound Select buttons **1–4** blink (more than four of these buttons will blink if you've added one or both of the Sound ROM expansion cards). Each button starts a different demo sequence when you press it. If you want to stop the demo before it finishes, press **14** and **16** simultaneously again.
2. When the demo finishes (or when you stop it), buttons **1–4** start blinking again.

3. Select another demo, or press **Cancel** to exit Demo mode (alternatively, you can press **14** and **16** simultaneously).

Troubleshooting

No Text in Display

If no messages are displayed when you turn on the power on your PC2 and no LEDs flash, check the power adapter connections at the AC outlet and the PC2 Adapter In jack.

Low Battery

When you turn your PC2 off, a lithium battery protects the memory that the PC2 uses to store user-defined programs and setups, and other editing changes that you've saved. Every time you turn on your PC2, it automatically checks the battery voltage. If it's getting low, you'll see a message like this before the PC2 finishes starting up:

**Battery voltage is
low (2.7 volts)**

When you see this message, you should replace your battery immediately, to avoid losing your data. See page A-1 for instructions.

No Sound

If no sound comes from the audio or headphones outputs of your PC2 when you play the keyboard, check the following:

- The Volume slider might be set too low
- There's no current program or setup selected (the display shows **Not Found**)
- Continuous control pedal 1: check the connection, and check the position of the pedal
- You might be in MIDI Setups mode with all zones muted (inactive): press any or all of the four buttons labeled **Zone 1-Zone 4**, and the lights in the buttons will turn green
- Local control might be off: press the **Global** button, then turn the large knob in the Data Entry region of the front panel one click to the right
- The PC2 might be sending to MIDI only: press the **MIDI Xmit** button in the Zone Parameters region of the front panel, then press the right-arrow button under the display once, then turn the large knob in the Data Entry region until you see **Local** or **Local+MIDI**

No Sound from Receiving Instrument

If you are trying to control another instrument using MIDI and that instrument doesn't respond to your PC2, check the following:

- A working MIDI cable should connect the PC2's Out or Thru/Out jack to the In jack of the other instrument
- If you're using the MIDI Thru/Out port, flip the switch near the MIDI In port to the out position (a ball-point pen works well for this)
- Continuous control pedal 1: check the connection and pedal position
- The other instrument should be receiving on the same MIDI channel that the PC2 is using to transmit MIDI information
- All zones that you want to transmit must be active (the lights in the **Zone 1–Zone 4** buttons must be green)
- The PC2 might be sending MIDI information only to itself: press the **MIDI Xmit** button in the Zone Parameters region of the front panel, then press the right-arrow button under the display once, then turn the large knob in the Data Entry region until you see **MIDI** or **Local+MIDI**

Chapter 3

Performance Features

In This Chapter

Chapter 3 shows you how to get the most out of your PC2 in performance settings. The overview introduces a few important features and concepts, while the following sections provide more detail.

- The Front Panel..... 3-3
- Selecting Programs and Setups .. 3-13
- EQ..... 3-14
- Effects..... 3-14
- Layering and Splitting..... 3-17
- Muting and Soloing .. 3-19
- Saving the Internal Setup .. 3-21
- Digital Audio Output. 3-21

Overview

Modes

The PC2 has three performance modes: Internal Voices, MIDI Setups, and KB3. Select the performance mode by pressing the corresponding button in the Sound/Setup Select region.

Internal Voices mode lets you play one internal voice, or *program*, at a time. A program consists of a single sound (like piano or strings), and the settings that affect that sound (like which part of the keyboard it uses). The PC2 starts in Internal Voices mode when you turn it on.

MIDI Setups mode is what makes the PC2 such a powerful MIDI controller. In this mode you can play one *setup* at a time. A setup divides the PC2's keyboard into four zones, each of which can cover part or all of the keyboard. Each zone can use a different MIDI channel and play a different program. Each zone can also have its own controller assignments; for example, the Mod Wheel can do something different in each zone of a setup.

In KB3 mode, the PC2 uses a different synthesizer technique (tone wheel emulation) to reproduce the sound of classic tone-wheel organs (like the Hammond B-3). In most other respects, KB3 mode is like Internal Voices mode.

Objects

Throughout this manual, we'll occasionally mention *objects*, which may sound a bit technical, so we'll explain. *Object* is the collective term we use to refer to any chunk of information that the PC2 stores or processes. Many of these objects are invisible to you, but you'll be working regularly with the highest-level object types: programs, setups, and effects. When you're editing programs, there's a good chance you'll work with another important object type: keymaps. You might also use System Exclusive (SysEx) messages to store programs, setups or effects to an external device—or use a single SysEx message to store *all* the objects you've modified while editing.

Editors

In addition to the performance modes, there's also a series of editing modes, where you can make changes that affect each of the performance modes (or the entire PC2). Turn to Chapter 4 for details about editing.

The Internal Setup

The three performance modes are quite different from a musician's viewpoint. The most noticeable difference is the way the liquid-crystal display (LCD) looks in each mode, as you'll learn on page 3-6.

Behind the scenes, however, the performance modes aren't as different as they seem. In fact, they have quite a bit in common. For example, consider that familiar controller the Pitch Wheel. Push it up and you bend notes up; pull it down and you bend notes down. This works in all three performance modes.

The Pitch Wheel does what it does because the PC2 is programmed that way—but you could program it for other functions if you wanted. In a *setup*, the Pitch Wheel can do something different *in each zone*—and that's true for all the assignable physical controllers: Mod Wheel, sliders, pedals, and more.

In a *program* (Internal Voices mode or KB3 mode), things are different. From the viewpoint of you the musician, programs don't *have* zones, so each physical controller can do only one thing, but it's up to you to decide what each physical controller does. That information gets stored in the *internal setup*, which has only one zone, but is otherwise exactly like a setup in MIDI Setups mode.

Every program in Internal Voices mode uses the internal setup to determine the assignments of the physical controllers—and many other characteristics. Programs in KB3 mode also use the internal setup (although some of the physical controllers in KB3 mode are programmed at the factory to override the settings of the internal setup).

Effects and EQ

Whichever mode you're in, the PC2 can apply three-band equalization (EQ) to the programs you're playing. You can also choose from a long list of digital effects, from reverb and chorus to rotary-speaker effects.

Physical Controllers

The PC2 provides a wide variety of physical controllers for modifying your sound as you play. There are two basic types: switch and continuous. Switch controllers generate MIDI messages with one of two possible values: On (127) and Off (0). Continuous controllers generate MIDI messages with values from 0 to 127.

The PC2's onboard switch controllers include five programmable buttons, labeled **SW1–SW5**. You can make these buttons *momentary* (they stay on only when you press and hold them) or *toggle* (they alternate between on and off each time you press them). Each of these buttons has a red LED that lights up when the button is on. These buttons have preset functions in each performance mode, but you can reprogram them to do all sorts of things.

There are jacks on the rear panel for up to three switch pedals (the PC2 comes from the factory with one switch pedal). These pedals can also be programmed to be momentary or toggle, and can control a wide range of performance features.

The onboard continuous controllers include Pitch Wheel, Modulation Wheel, four sliders, and mono pressure (aftertouch). There are also four jacks on the rear panel for connecting two continuous controller pedals, a breath controller, and a ribbon controller. These continuous controllers are also fully programmable, with an extensive choice of options.

The Front Panel

The buttons, wheels, and sliders on the front panel control your PC2, both during performances, and when you're editing. Figure 3-1 identifies everything.

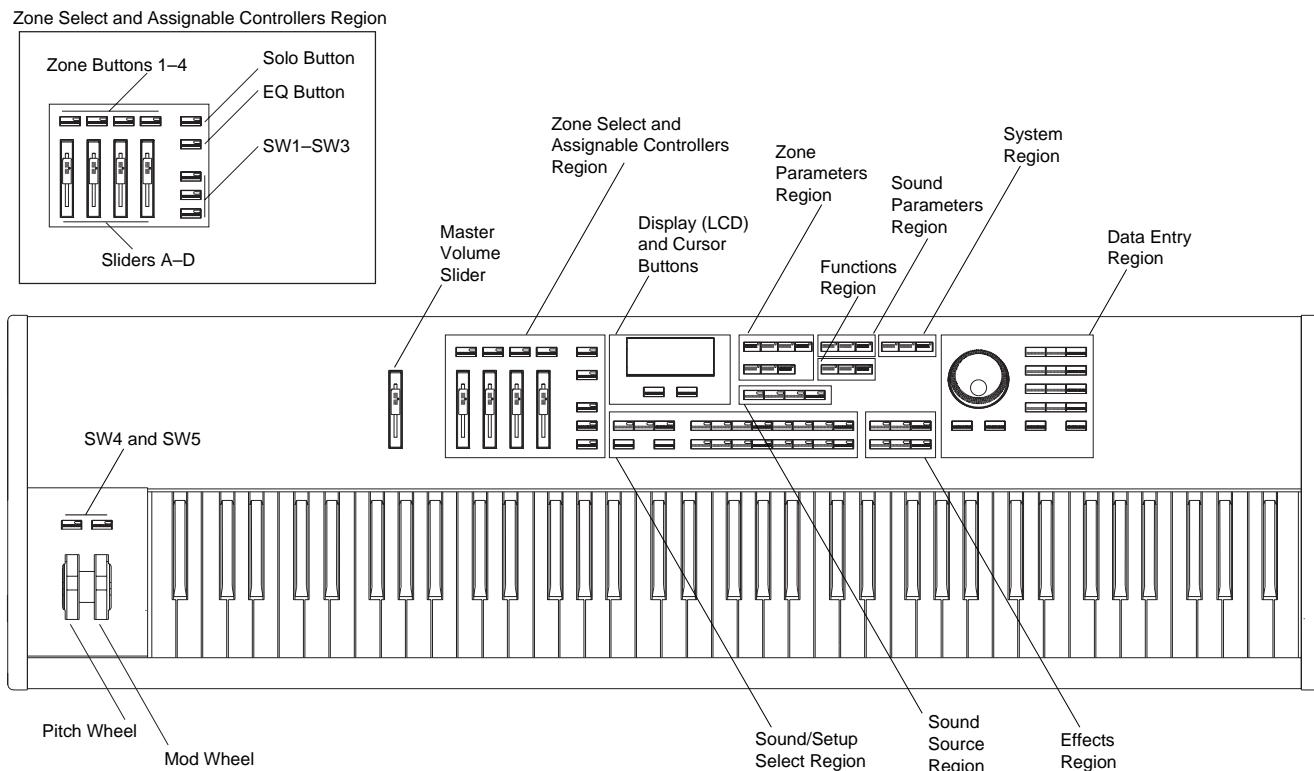


Figure 3-1 The PC2

Performance Features

The Front Panel

The buttons and sliders on the front panel are labeled in one of three colors, which correspond roughly to their functions in the three performance modes:

White	Internal Voices mode
Blue	MIDI Setups mode
Orange	KB3 mode

Naturally there are a few exceptions:

- The buttons in the Data Entry region (including the Alpha Wheel), the Effects region, the Functions region, and the Sound Source region apply to all three modes
- The **Master Volume** slider and the buttons in the System region control the entire PC2, regardless of the current mode
- The buttons in the Sound Parameters region apply to Internal Voices mode and KB3 mode
- Buttons **14** and **16** in the Sound/Setup Select region select the demo song in all three modes
- Instrument names in the Sound/Setup Select region are relevant only in Internal Voices mode
- The buttons under the display are relevant (and quite important) when editing any object: Internal-Voices programs, KB3 programs, or setups, but they don't do anything when you're just playing a setup
- The buttons **SW1–SW5** are functional in all three modes, although they often do different things depending on the mode

As you can see, many of the front-panel features have functions that vary depending on your performance mode. For convenience, we'll first describe the features that are common to all modes, then describe the features that are mode-dependent.

Common Features

The following front-panel features behave the same regardless of which mode you're in.

Master Volume Slider

Adjust the overall volume of the PC2's audio output with this slider. We recommend that you set this slider all the way down before you turn on your PC2 (at least the first time, anyway).

Data Entry

You'll use the Data Entry region to select programs and setups, and to make changes when you're programming (editing) the PC2. See *Data Entry* on page 4-2 for a complete description.

System

This region contains buttons that affect the entire PC2. The **Global** button brings up a menu of parameters controlling things like MIDI control and keyboard sensitivity. This menu also contains non-editable information about the PC2 (like available memory and whether you have any expansion sounds). There are also functions for resetting the PC2, saving programs and setups via MIDI, and MIDIScope, a MIDI analysis utility.

The **MIDI Recv** button brings up a menu for configuring each MIDI channel when the PC2 is receiving MIDI from another instrument or a sequencer: program selection, pan and volume settings, and the wet/dry mix of the effects.

The **Panic** button sends an All Notes Off message to the PC2 and to the MIDI Out port. If you ever have stuck notes, this will shut them off. (Pressing the **Panic** button during startup enables you to load new software via MIDI, as well as a few other functions).

Effects

The buttons in the Effects region control the two blocks of onboard effects that you can apply to programs and setups. You can turn the effects on and off, select different effects or reverbs for each of the effect blocks, and control the wet/dry mix for each effect block. You can specify how the PC2 assigns effects when you change programs or setups. See *Effects* on page 3-14 for more information.

Functions

You'll use the buttons in the Functions region when editing programs or setups. The **Store** button starts a dialog (the PC2 asks you a question that you answer, usually with Yes or No) for saving programs or setups. The **Copy** button lets you copy and paste whole zones within setups, or from one setup to another. Press the **Compare** button to hear the difference between your modified program or setup and the original. We'll talk about these more when we discuss editing (see *Copying and Pasting* on page 4-8, and *Comparing* on page 4-7).

Sound Source

The buttons in this region select the bank of programs or setups that the PC2 uses. There are four buttons: **Internal**, **User**, **Exp1**, and **Exp2**. Each button represents a sound source, or bank, for each performance mode—that is, there are four easily-accessible banks for each mode. Each bank can contain up to 128 objects.

In any performance mode, press one of the Sound Source buttons to select a different bank. The mode you're in determines what type of objects are stored in the various banks. (You can't mix object types in the same bank.)

There are eight banks for programs, and four for setups. The banks for Internal Voices mode and MIDI setups mode are numbered from 0 to 3, and correspond to the **Internal**, **User**, **Exp1**, and **Exp2** buttons—**Internal** is Bank 0, **User** is Bank 1, and so on. The banks for KB3 mode are numbered from 4 to 7, with the same correspondence to the Sound Source buttons.

Each Internal bank contains factory programs or setups. Each User bank stores the programs or setups that you create. Exp1 and Exp2 are empty until you fill them with programs or setups from expansion options that you can purchase from your Kurzweil dealer.

Selecting Banks and Programs on MIDI Slaves

When you're controlling other instruments from the PC2, you need a way to select programs from the PC2. Often these programs are stored in banks with IDs higher than 0–7. The PC2 can send a MIDI message that selects any bank numbered from 0 to 16,383, followed by a message that selects a program numbered from 0 to 127 within that bank. See *Sending Bank-Select and Program-Change Messages* on page 4-30 to learn how.

Performance Features

The Front Panel

Mode-Dependent Features

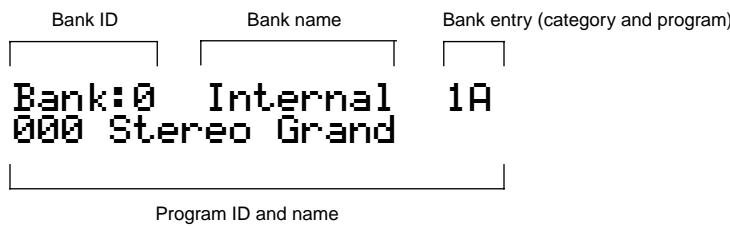
The following features behave differently depending on which mode you're in.

The Display (LCD)

The display looks quite different in each mode, so we'll show you examples of each.

Internal Voices Mode

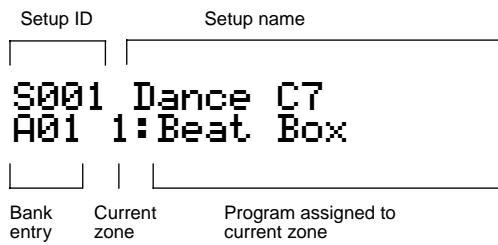
When you turn on your PC2, the display should look like this:



This is Internal Voices mode, where the PC2 always starts when you turn it on. The top line gives you information about the bank (sound source), while the bottom line shows the ID and name of the current program.

MIDI Setups Mode

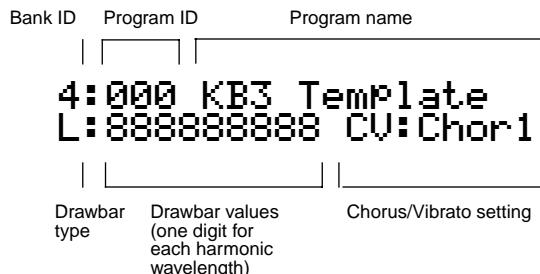
Press the **MIDI Setups** button twice to enter MIDI Setups mode, and the display looks like this:



The setup ID usually begins with **S** to indicate that you're playing a setup—although in Setups that have the AutoSplit feature turned on, the **S** is replaced by a caret (^). Notice that the bank entry is a *letter* followed by a *numeral*, which is the opposite of the way the bank entry looks in Internal Voices mode.

KB3 Mode

Press the **KB3 Mode** button twice to enter KB3 mode; the display changes to something like this:



You'll find KB3-mode programs in banks with IDs 4–7. Unlike Internal-Voices programs and setups, they don't display a bank entry.

KB3 programs use tone-wheel synthesis to produce sound. When you select a KB3 program (or a setup that contains one), the tone wheels start up and run constantly while the program is in use. This requires quite a bit of processing, and consequently has an effect on the polyphony available for other programs. KB3 programs use 44 of the PC2's 64 available voices, so when you use a KB3 program in a setup, you have 20 voices of polyphony available for the remaining programs in the setup.

Because of the special processing requirements of KB3 programs, you can play only one KB3 program at a time, whether in Internal Voices mode or in MIDI Setups mode. There's a parameter in the Global menu called KB3 MIDI Chan, which specifies which MIDI channel is available for playing KB3 programs. You can't play KB3 programs on any other channel. This is important to note if you're playing the PC2 from an external sequencer. In this case, make sure that the sequencer selects KB3 programs only on the KB3 channel; otherwise, the KB3 program won't play.

KB3 programs have nine adjustable drawbar settings, with harmonic wavelengths ranging from 1 to 16 feet. You can change the drawbar settings using the drawbar controls: Sliders **A–D** and the Mod Wheel. Here's how it works:

When the LED in the **Drawbar Toggle** button is off, Sliders **A–D** represent drawbars 1–4 (the four longest—or lowest-pitched—harmonic wavelengths). Press the **Drawbar Toggle** button, and its LED lights. The sliders then represent drawbars 5–8 (shorter, higher-pitched wavelengths). The Mod Wheel always represents drawbar 9, the shortest wavelength, regardless of the status of the **Drawbar Toggle** button.

There are nine digits in the bottom line of the display that show the current drawbar values. From left to right, they correspond to drawbars 1–9. Moving one of the drawbars changes the corresponding drawbar values, and changes the nature of the organ sound.

Try it out. Make sure you're in KB3 mode, then move one of the sliders. You'll see one of the values on the bottom line change. Moving a slider all the way down is equivalent to pulling out the drawbar on a real organ. The corresponding value is **8**. Conversely, pushing the slider up is equivalent to pushing the drawbar in, with a corresponding value of **0**. For drawbar 9, pulling the Mod Wheel down (the off position) corresponds to pushing the drawbar in, and pushing it up corresponds to pulling the drawbar out.

To the left of the drawbar values, there's a letter (either **P** or **L**) that indicates whether the program has preset or "live" drawbar values. A program with preset drawbars always starts with the same factory-set drawbar values when you select the program. Moving the drawbar controls changes their values temporarily, but the next time you select that program, the

drawbars will once again be at their preset startup values. (You can edit the startup values for programs with preset drawbars; see *Changing Preset Drawbar Values* on page 4-26.)

A program with live drawbars starts with drawbar values that reflect the positions of the drawbar controls. Moving the drawbar controls changes their values further. Most of the KB3 programs have preset drawbars, although you can also edit them to have live drawbars.

Cursor Buttons

Under the display are two buttons labeled < and >. We call these the cursor buttons, because they control the *cursor*, which is a flashing bar that appears under one of the characters in the display. The following table shows what happens in each mode when you press one of the cursor buttons.

Mode	Function
Internal Voices	Selects bank ID parameter or program ID parameter
MIDI Setups	None
KB3	Selects bank ID parameter, program ID parameter, or chorus/vibrato setting parameter

You'll also use the cursor buttons when editing, to select what you want to edit. See *Basic Editing Concepts* on page 4-1 for more about the cursor buttons.

Sound Parameters

This region contains buttons for editing programs in Internal Voices mode and KB3 mode (they don't do anything when you're in MIDI Setups mode). Each button represents a menu of parameters controlling one of three aspects of the program. See *The Program Editor* on page 4-10 for details.

Zone Parameters

The buttons in this region are primarily for editing setups. Each button represents a menu of parameters controlling various aspects of the setup. We'll discuss the zone parameters in more detail in *The Setup Editor* on page 4-12.

Sound/Setup Select

Use the buttons in this region to select programs and setups while in any performance mode. The buttons are organized into three groups:

Mode selection	Internal Voices, MIDI Setups, KB3 Mode
Category/Group selection	Next Group, Previous Group
Sound/Setup selection	1–16 (also labeled with program categories for Internal Voices mode)

The mode-selection buttons work the same regardless of your performance mode, but the other two groups of buttons are mode-dependent, as described below:

Internal Voices Mode	Each bank is organized in 16 categories of 8 programs, organized by program category (pianos, organs, etc.). Each program has a bank entry from 1A–16H , as shown at the top right of the display. Press 1–16 to select a category. Press Next Group or Previous Group to select a program within the current category. (In Internal Voices mode, think of these buttons as Next Program and Previous Program). In other words, the numbered buttons change the numeral (the category) in the bank entry, and the Next Group and Previous Group buttons change the group letter within the current category.
MIDI Setups mode	Each bank of 128 setups is organized in 8 groups of 16 setups. Each setup has a bank entry from A01–H16 , as shown at the bottom left of the display. Press Next Group or Previous Group to select a group of setups. Press one of the buttons labeled 1–16 to select setups within that group. In MIDI Setups mode, the numbered buttons change the numeral in the bank entry, and the Next Group and Previous Group buttons change the letter.
KB3 mode	The notion of a category is less meaningful when all the sounds in the bank are organs, so KB3 programs don't display bank entries (although the bank ID does appear at the top left of the display). Even so, each KB3 bank is organized the same way as in Internal Voices mode—that is the 16 internal KB3 programs are accessible using buttons 1–16 . The Next Group and Previous Group buttons aren't relevant in the Internal bank of KB3 mode, since there's only one KB3 program per "category." If you press one of these buttons, either nothing will happen, or the display will tell you that the program is not found. In the User bank, the PC2 stores KB3 programs with consecutively-numbered IDs., and the Next Group and Previous Group buttons work the way they do in Internal Voices mode.

Zone Select and Assignable Controllers

The behavior of most of the buttons and sliders in this region depends on the performance mode.

Internal Voices Mode

In Internal Voices mode, the four zone buttons correspond to the white labeling: **Main**, **Layer**, **Split**, and **Split Layer**. Using these buttons, you can quickly create split programs (two programs playing on different parts of the keyboard) or layered programs (two sounds playing together across the entire key range of the internal setup). You can also create combinations of splits and layers. See *Layering and Splitting* on page 3-17 for details.

Keep in mind that if you create splits or layers (or combinations), you can't save the resulting sound as a *program*, but you can save it as a *setup*. We'll discuss this further in *Layering and Splitting*.

The **Solo** button is relevant only if you've created a split or layer, in which case you can use the **Solo** button to play just one of the sounds, and mute the other(s). See *Layering and Splitting* for details.

Performance Features

The Front Panel

The **EQ** button is the one feature in the Zone Select and Assignable Controllers region that does the same thing in all three performance modes. It turns the three-band equalization (EQ) on and off. The EQ settings affect the entire PC2. See page 3-14 to learn how to change the EQ settings.

Button **SW1** (also labeled **Octave Shift**) is a convenient way to “transpose” the entire PC2 down one octave in Internal Voices mode. Press **SW1** once to activate transposition, and the LED will light. This causes a “note shift” that for most programs lowers the pitch an octave. What’s actually happening is that the programs get shifted so that each key plays a different MIDI note number (for example, C 4 normally plays Note Number 60, but with octave shift on, it plays Note Number 48). We mention this because in most programs, it seems that you’re transposing down an octave. For non-pitched programs like drums and percussion, however, each sound gets moved an octave upward (so if you play C 4 to play a snare with octave shift off, you’ll play C5 to get the same snare when octave shift is on). Press **SW1** again to remove the shift.

If you’ve used the AutoSplit feature to make quick layers and splits, the octave shift transposes the layers in the lower part of the keyboard (corresponding to the **Zone 3** and **Zone 4** buttons) *up* one octave, and transposes the layers in the upper part of the keyboard (corresponding to the **Zone 1** and **Zone 2** buttons) *down* one octave. This keeps the low notes from being too low, and the high notes from being too high.

Button **SW2** (also labeled **Chorus/Vib On/Off**) activates or deactivates the chorus and vibrato effects built into many of the organ voices in Internal Voices mode.

Button **SW2** (also labeled **Rotary Fast/Slow**) changes the speed of the rotary-speaker effect that’s built into many of the organ programs in Internal Voices mode. Press **SW2** once to light its LED and apply a rapid rotary effect. Press it again to return to a slower effect. If a program doesn’t have a built-in rotary effect, or if you turn the effect off by pressing the **FX-B** button, this button doesn’t do anything. Button **SW2** also has uses in some of the non-organ programs. Check out Program 96 and listen for the changes in the sound as you switch the button on and off.

Button **SW3** (also labeled **Chorus/Vib Depth**) sends MIDI Controller 12 (EfCt 1), which may or may not have an effect, depending on the current program. It sends a value of **127** when on, and **0** when off.

Although Buttons **SW4** and **SW5** aren’t in the same region as **SW1–SW3**, they work in a similar manner (they’re located above the Pitch Wheel and Mod Wheel). By default, **SW4** activates the arpeggiator when it’s on, and deactivates it when it’s off. The default setting for **SW5** is to send MIDI Controller 29 with a value of **127** when it’s on; it sends MIDI Controller 29 with a value of **0** when it’s off.

The functions of **SW1–SW5** in Internal Voices mode are defined by the internal setup, but they’re programmable. If you want them to do something else, you can edit the internal setup and change the buttons’ assignments. Keep in mind, however, that this will affect *all* programs in Internal Voices mode.

The functions of Sliders **A–D** depend not only on the performance mode, but also depend on whether the **EQ** button is on. When the **EQ** button is off, the sliders operate as follows:

- Slider **A** controls the wet/dry mix for FX-A, the multi-effect block. You won’t notice any change in the effect level unless the **FX-A** button is on.
- Slider **B** controls the wet/dry mix for FX-B, the reverb block. You won’t notice any change in the reverb level unless the **FX-B** button is on.
- Slider **C** is usually a timbre control, although it can vary from program to program. Slider **D** has different functions depending on the current program.

When the **EQ** button is on, Sliders A–C control the values of the Low, Mid, and High parameters that you see in the display. Slider **D** doesn't do anything in this case. If the **EQ** button is on, press it to turn it off and return to Internal Voices mode. When the **EQ** button is off, the sliders work as follows.

MIDI Setups Mode

In MIDI Setups mode, the four zone buttons activate and deactivate the zones in a setup. This differs from turning the zones on and off, which is done with the MIDI Channel parameter in the MIDI Xmit menu.

The tri-colored LED in each zone button indicates the zone's status:

Off	Empty zone—that is, a zone that has its MIDI Channel parameter set to Off . When a zone's LED is off (unlit), the zone does not produce sound, even though it has a program assigned to it.
Red	Soloed zone. Only one zone can be soloed at a time. When a zone is soloed, <i>only</i> that zone plays notes and generates controller information. Other zones, if they're not empty, still generate program changes and entry/exit controller values.
Green	Active zone. As long as no other zone is soloed, an active zone plays notes—and generates controller information, program changes, and entry/exit controller values. If another zone is soloed, an active zone is "backgrounded"—its status LED remains green, but it doesn't play notes or generate controller information.
Orange	Muted zone. Muted zones don't play notes or generate controller information, but they do generate program changes and entry/exit controller values.

The following table shows how a zone's status affects the data generated by the zone.

LED Color	Zone Status	Data Generated by Zone			
		Notes	Controllers	Program Changes	Entry and Exit Values
Red	Soloed	✓	✓	✓	✓
Green (no others are red)	Active	✓	✓	✓	✓
Green (another is red)	Backgrounded			✓	✓
Orange	Muted			✓	✓
(Off)	Empty				

When you're in MIDI Setups mode, the bottom line in the display indicates the current zone—that is, the one that will be affected by any editing you do to the setup. In the following example, Zone 1 is the current zone, as indicated by the numeral just to the left of the colon:

S002 Unison Line
A02 1:Big Brass

Performance Features

The Front Panel

Press any zone button once to make that zone the current zone. Assuming the zone is active (it's active if the LED in its zone button is green), pressing its zone button once mutes the zone, turning its LED orange. Press its zone button again to reactivate the zone, turning its LED green.

Press the **Solo** button to solo the current zone. The LED in the Solo button lights up, and the soloed zone's LED also turns red. The other zone's LEDs don't change color, but if they're active (green LED), they stop generating note and Controller data, becoming backgrounded.

While the **Solo** button is on, you can press any zone button to solo the corresponding zone. You can solo a zone even if it's muted. Press the **Solo** button again to turn its LED off, and any backgrounded zones become active again. Muted zones stay muted.

The **EQ** button works the same way as it does in Internal Voices mode, as described on page 3-14.

Buttons **SW1–SW5** are programmable in MIDI Setups mode. They can have different functions for each zone in every setup. In other words, you can change what one of these buttons does in Zone 1 of a setup, for example, and it won't change what that button does in the other zones of that setup (or in any other setup).

Sliders **A–D** are also programmable in MIDI Setups mode, and like the programmable buttons, they can do different things in each zone of each setup.

KB3 Mode

The zone buttons control the percussion in the attack of each note you play in KB3 mode. Press the **Zone 1** button to light its LED and activate percussion. When percussion is on, the other three zone buttons control the percussion's volume (loud or soft), its decay rate (fast or slow), and its pitch. Press the **Zone 1** button again to turn off its LED and deactivate percussion.

When percussion is inactive, the percussion volume, decay, and pitch are also inactive.

You can change the characteristics of the percussion effect with a series of parameters in the Envelope menu. We'll describe this in *The KB3 Editor* on page 4-20.

The **Drawbar Toggle** button determines which drawbars are controlled by Sliders **A–D**. When the button is on, the sliders control drawbars 1–4 (corresponding to the first four digits from the left in the bottom line of the display). When the button is off, the sliders control drawbars 5–8 (the fifth through eighth digits). Drawbar 9 is always controlled by the Mod Wheel.

The **EQ** button works the same way as it does in Internal Voices mode, as described on page 3-14.

Buttons **SW1–SW3** control rotary-speaker effects, as well as chorus and vibrato. These buttons are active only when the **FX-A** button is on. (There's no octave shift feature in KB3 mode.)

Button **SW1** switches between a fast and slow rotary effect; on is fast, and off is slow. When you turn this button on, its LED lights, and the rotary effect ramps up from a preset low rate to a preset high rate (both of which are controlled by parameters in the LFO menu).

Button **SW2** turns the chorus / vibrato on and off while **SW3** cycles through six effects—three chorus settings, and three vibrato settings. When you turn SW2 on, its LED lights, and you can change the chorus or vibrato by pressing **SW3** one or more times. The LED in **SW3** does not light up.

The functions of Buttons **SW4** and **SW5** are determined by the internal setup, just as they are in Internal Voices mode.

Sliders **A–D** control the drawbar settings. They correspond to drawbars 1–4 when the **Drawbar Toggle** button is off, and drawbars 5–8 when the **Drawbar Toggle** button is on.

Selecting Programs and Setups

1. Select a performance mode by pressing **Internal Voices**, **MIDI Setups**, or **KB3 Mode** in the Sound/Setup Select region (we call these mode-selection buttons). The mode you're in affects how the other Sound/Setup Select buttons work. When you press one of these buttons, its LED flashes to prompt you to select a sound source.
2. Select a sound source by pressing **Internal**, **User**, **Exp1**, or **Exp2**. If you prefer, you can press a mode-selection button twice instead of pressing a mode-selection button then a sound-source button. This causes the PC2 to revert to whatever sound source and program or setup you were using the last time you were in that mode.
3. Select a program or setup. The easiest way is to use Sound/Setup Select buttons **1–16**, but there are alternatives, as described below.

As an alternative, you can skip Step 2 above, and press one of the Sound/Setup Select buttons immediately after pressing a mode-selection button. This selects the corresponding program or setup in the same sound source you were using the last time you were in that mode.

Other Selection Methods

There are three other ways to select a program or setup:

- Type its ID (number) on the alphanumeric buttonpad, then press **Enter**
- Scroll through the list using the Alpha Wheel
- Scroll through the list using the **Plus** or **Minus** button under the Alpha Wheel

Internal Voices Mode and KB3 Mode

When using the Alpha Wheel or the **Plus** or **Minus** button to scroll through programs, you can scroll through program categories, which you can't do with the **Next Group** and **Previous Group** buttons. For example, if you're playing the program at bank entry **1H**, you can turn the Alpha Wheel one click to the right to scroll to bank entry **2A**.

Using the Alpha Wheel or the **Plus** or **Minus** button also enables you to scroll through banks. You can scroll through all four banks within each performance mode, and you can scroll from the Internal Voices banks to the KB3 banks and back.

The **Next Group** and **Previous Group** buttons select programs sequentially by bank entry (and program ID) within the current category. When you select a category with one of the Sound Select buttons, the program you see is the program that was current the last time you were in that category. This enables you to select your favorite program in each category simply by pressing the Sound Select button for that category.

MIDI Setups Mode

Using the Alpha Wheel or the **Plus** or **Minus** button scrolls through all the occupied banks in MIDI Setups mode, but won't scroll into either the Internal-Voice programs or the KB3 programs.

The Setup Select buttons select the 1st through 16th setup in a group of setups. The **Next Group** and **Previous Group** buttons select different groups of 16 setups. This is especially useful when you're storing your own setups in the User bank, because you can store the setups in logical groupings of 16, which is extremely convenient for organizing setups to correspond to a play list. For example, you might put all the setups for your first set into the first group of User setups

(setup IDs 129–144, with bank entries of **A01–A16**), and setups for the next two sets in **B01–B16** and **C01–C16**. Then you can select the group of setups corresponding to each set with the **Next Group** and **Previous Group** buttons, with a well-planned sequence of 16 setups for the set accessible with Sound Select buttons **1–16**.

EQ

The PC2 comes with its own three-band equalization (EQ), or tone controls. The EQ is global which means that there is only one setting that is used all of the time regardless of which program or setup is selected. Its purpose is to adjust the PC2 for individual listening situations.

Changing the EQ

1. Press the **EQ** button to light its LED, and the EQ parameters appear in the display:

EQ: Low Mid High
+0dB +0dB +0dB

Each band starts at **0 dB** when you turn on your PC2 (this is called *flat* equalization).

2. Adjust the level of each frequency range using Sliders **A**, **B**, and **C**, which correspond to the low, middle, and high frequency range. You can go from **-12 dB** (lowering the volume) to **12 dB** (raising the volume). You'll hear the sound change as you adjust each level (depending on the sound, the change can be quite subtle).

You can also use the cursor buttons and Alpha Wheel to change the EQ settings.

3. Press **EQ** again to return to your previous performance mode (alternatively, you can press **Cancel**, or press one of the mode-selection buttons twice).

Effects

The PC2's digital multi-effects consist two independent effects blocks called **FX-A** and **FX-B**. Each block always has an effect associated with it, depending on the current program or setup. The **FX-A** and **FX-B** buttons in the Effects region of the front panel enable the "sends" to each effect block. When these buttons' LEDs are lit, the corresponding effect sends are enabled, and you'll hear the corresponding effects. You'll notice that as you select programs or setups, the **FX-A** and **FX-B** LEDs come on and go off according to the settings for each program or setup, indicating which effects blocks are active in the default settings for the program or setup.

There are over 150 effects available for **FX-A**, including reverbs, delays, choruses, flangers, phasers, tremolo, panners, envelope filters, distortions, rotary speakers, compressors, enhancers, waveform shapers, and multi-effect combinations. There are 30 reverbs available for **FX-B** (these reverbs are also available for **FX-A**).

Activating Effects

By default, most programs and setups have at least one effect send active. You can change the sound of a program or setup quickly by activating or deactivating the sends to the effect blocks.

To activate or deactivate the send to an effect block, press either **FX-A** or **FX-B**. Normally, the effect blocks are mutually exclusive—that is, turning on one send turns the other one off (we

assume that you won't normally want more than one effect to be active). You can activate the sends to both blocks, however, by pressing **FX-A** and **FX-B** at the same time.

Activating or deactivating the sends to each effect block this way is a performance feature only; the sends return to their preset state as soon as you select another program or setup. If you want a send to be inactive (or inactive) when you select a program or setup, you'll need to edit the effect settings for that program or setup, then store the changes. See *Making Effects Active at Program or Setup Selection* on page 4-25.



Note: In Internal Voices mode, Sliders A and B control the wet/dry mix of FX-A and FX-B. With the slider up, the corresponding effect is at full strength (100% wet); with the slider down, the effect is inaudible (0% wet). If you're not sure you're hearing an effect, try moving these sliders up and down a few times. See *Wet/Dry Mix* on page 3-16 for more information.

Changing Effects

Each effect block has a selection button (**Select**) next to its activation button (**FX-A** and **FX-B**). Use these buttons to start the process of changing effects. In the following example, we'll select a different effect for FX-A. We'll do this in Internal Voices mode, since this enables us to use Slider A to adjust the wet/dry mix. We'll also use Program **000 Stereo Grand**, since it has a distinctive effect assigned to FX-A.

1. Make sure that you can hear the effect you want to change; the send to FX-A must be active, and the wet/dry mix must be high enough for the effect to be audible. If necessary, press the **FX-A** button to light its LED and activate the send to FX-A. Move Slider A all the way up to set the wet/dry mix to 100%.
2. Press the **Select** button next to the **FX-A** button. Its LED lights to indicate that FX-A is the current effect block. The display should resemble this:

**FXA Select : Voices
61 Classic Chapel**

3. Use any data entry method to change the effect displayed on the bottom line (the Alpha Wheel is probably the easiest). You should hear a change almost immediately, although you might notice that the effect takes a second or so to reach its full level.

Changing effects actually puts the PC2 into the Effects Editor, where you can make other changes to the effect settings (we'll discuss the Effects Editor further in Chapter 4). Unless you store your changes, the effect assignment reverts to its preset state as soon as you select another program or setup. See *Saving Effects* on page 4-23 to learn how to preserve your changes.

Muting Effects

Suppose you're in the studio, and your recording engineers are using their own external effects, or maybe a global reverb setting for all channels. You want to silence all your effects and/or reverb temporarily, but you don't want to make any lasting changes to the programs or setups you're playing. You can quickly disable the PC2's effects so that the PC2 is completely dry no matter what you're playing. By the way, this doesn't disable the sends; they're still active. Effects muting is more like a bypass.

Just press the activation and selection button simultaneously for the effect block you want to mute. The display will briefly indicate that corresponding effect block is muted. To remove the

muting, press the two buttons simultaneously again. The display briefly indicates that the muting is turned off.

Wet/Dry Mix

When the send to FX-A is on and the send to FX-B is off (which is the case for the majority of the factory programs and setups), the audio signal comes from the PC2's sound engine, and goes first through FX-A, then through FX-B, then to the audio out jacks. Consequently there are three wet/dry mix parameters:

- A Controls how much of FX-A's effect gets applied to the dry signal coming from the sound engine
- B Controls how much of FX-B's effect gets applied to the dry signal coming from the sound engine.
- Global A>B Controls how much of the processed signal coming from FX-A goes to FX-B and gets FX-B's effect applied to it.

In Internal Voices mode, the settings for these three parameters affect every layer in the program. In MIDI Setups mode, GlobalA>B affects every zone in the setup (and every MIDI channel, which is relevant when the PC2 is receiving MIDI information from an external source), but you can have different settings for A and B in each zone, and on each MIDI channel.

The specialized double-block KB3 effects use a different processing structure; only FX-A is available when you use these effects. Consequently, both B and Global A>B are inapplicable.



Note: You can use the KB3 effects for Internal-Voices programs and setups, not just for KB3 programs. If you use a KB3 effect in one of the zones in a setup (or on one of its MIDI channels), you might want to route the setup's other zones (or channels) to FX-B. This bypasses the KB3 effect for those zones or channels, since the send to FX-B is inactive. It depends on whether you want the KB3 effect applied to all the programs in the setup.

When you press the **Wet/Dry** button in Internal Voices mode or MIDI Setups mode, the display looks similar to this:

Z: 1 Global A>B: 22 %
A: 64 % B: (36 %)

The first character is **L** (layer) if you're coming from Internal Voices mode, or **Z** (zone) if you're coming from MIDI Setups mode. The numeral following the **L** or **Z** indicates the current layer or zone. Use the zone buttons to change the current zone or layer.



Note: Since the **L** indicates that you're changing the wet/dry mix for a program, the zone buttons don't do anything significant, since any change you make to any of the parameters affects every layer in the program, regardless of which layer is current. The only reason the **L** is there is to remind you that you're adjusting a program and not a setup.

Note the parentheses around the value for B. This indicates that the send to FX-B is inactive. In this case, you can edit the value, but it won't change the wet/dry mix for FX-B. (Additionally, in Internal Voices mode, Slider B won't adjust the mix.) If you turned on the FX-B send, the parentheses would disappear.

In Internal Voices mode, you can change the wet/dry mix for both FX-A and FX-B without going to the Wet/Dry parameters. When the send to an effect block is active, the corresponding slider (Slider A for FX-A and Slider B for FX-B) adjusts the wet/dry mix. This is a performance feature only; if you want to change the wet/dry mixes permanently, you'll need to use the Wet/Dry parameters, then save either the resulting effect or the entire program.

There's a diagram of the PC2's audio signal routing on page B-8.

Layering and Splitting

In Internal Voices mode, you can play one program at a time, since Internal Voices mode is based on the internal setup, which contains a single zone (as described on page 3-2). If you wanted to create a multi-zone setup with different programs in each zone, you could go to MIDI Setups mode, then start programming (editing): assigning MIDI channels and programs to zones, assigning physical controllers, and so on. This gives you a great deal of control and flexibility, but it takes a bit of time.

If you're on stage and you suddenly decide that your solo needs two sounds instead of one, you don't want to take the time to edit a setup; you just want to add another sound as quickly as possible. Fortunately, the PC2 makes it easy to do this kind of thing without doing any actual editing.

Layering is playing two sounds on the same part of the keyboard. Splitting is playing two sounds on different parts of the keyboard. Using the PC2's AutoSplit feature, you can create a layer or a split by pressing a single button. With a few more button presses, you can change the sounds in the layers or splits, and create combinations of layers and splits. We'll show you how to do it, then we'll explain what's going on.

Using AutoSplit for Quick Layers and Splits

We're going to start with piano, layer it with strings, add a split with bass, then layer the bass with drums—and we'll do it with six button presses. If you're not already in Internal Voices mode and playing Program **000 Classical Grand**, press **Internal Voices** (in the sound /Setup Select region), then **Internal** (in the Sound Source region), then Sound Select Button **1 (Piano 1)**.

1. Press **Layer** (in the Zone Select and Assignable Controllers region—also labeled **Zone 2**).
2. Press Sound Select Button **9 (Strings)**. Now you have piano and strings layered across the entire keyboard.
3. Press **Split (Zone 3)**.
4. Press Sound Select Button **14 (Bass)**. Now you have a plucked electric bass from the bottom of the keyboard up to G[#] 3, and layered piano and strings from A 3 up.
5. Press **Split Layer (Zone 4)**.
6. Press Sound Select Button **15 (Drums)**. That's it: bass layered with drums in the lower part of the keyboard, and piano layered with strings in the upper part.

How AutoSplit Works

We'll go through the same procedure again, explaining what's going on with each step. If you want to follow along, start by pressing **Internal Voices** twice to return to Internal Voices mode. Program **000 Classical Grand** should appear in the display. Notice the four zone buttons: Zone 1 is active (the LED in the **Zone 1** button is green), while Zones 2–4 are muted (orange LEDs).

1. Press **Layer (Zone 2)**. The first thing to notice is that you're in MIDI Setups mode. That's because you now have two active zones, and as you know, you can't have more than one zone in Internal Voices mode (because Internal Voices mode is based on the internal setup, which has only one zone.) Consequently the PC2 automatically switches to MIDI Setups mode so that it can activate Zone 2. Notice that the LED for Zone 2 is green, confirming that Zone 2 is active.

As soon as you press **Layer**, Zone 2 becomes active, and whatever program is assigned to Zone 2 gets layered with the piano. As it happens, the strings program is already selected for Zone 2. That's because it's the program most recently assigned to Zone 2 (the first time we went through this exercise). If you had selected a different setup before returning to Internal Voices mode, you'd most likely see a different program in Zone 2 now.

Zone 2 is also the *current* zone, which we know from the information in the top line of the display (whichever zone number you see is the current zone). Incidentally, the word **auto** means that the AutoSplit feature is on (if it weren't, none of this would work).

2. Press Sound Select Button **9 (Strings)**. OK, you didn't need to in this case, but pretend that you did. In Step 1 we created the layer by activating Zone 2; now we've assigned a program to it.
3. Press **Split (Zone 3)**. The PC2 automatically splits the keyboard at a predetermined point (it's called the AutoSplit Key, and by default it's G[#] 3, although you can change it). Zones 1 and 2 play above the AutoSplit Key. Zone 3 becomes active (and becomes the current zone), and whatever program is assigned to Zone 3 plays below the AutoSplit Key.
4. Press Sound Select Button **14 (Bass)**. In Step 3 we created the split by activating Zone 3 below the AutoSplit Key; now we've assigned a program to it.
5. Press **Split Layer (Zone 4)**. Zone 4 becomes active (and becomes the current zone), and whatever program is assigned to Zone 4 gets layered with the bass.
6. Press Sound Select Button **15 (Drums)**. In Step 5 we created the layer by activating Zone 4 and layering it with Zone 3; now we've assigned a program to it.

Saving Quick Layers and Splits

With practice, you can use AutoSplit to create layers and splits in seconds, which is a great performance feature. If you come up with something you like, you might as well save it for future use.

1. Press **Store** (in the Functions region of the front panel). The display looks something like this, prompting you to save the setup at the lowest-available ID in the User bank for setups:

Save setup 129?
A01 Setup 129

2. Press **Yes**. the display briefly shows **Setup NNN saved!** then returns to MIDI Setups mode.

When you save a setup this way, the PC2 turns the AutoSplit feature off for that setup, and sets the low and high notes of each zone. See *Muting and Soloing* on page 3-19 to learn about how this affects playing setups. If you want, you can edit the setup and turn AutoSplit back on (there's a good reason to do so, described in *The AutoSplit Feature* on page 3-20). See *Turning AutoSplit On and Off* on page 4-25 to learn how.

Changing the AutoSplit Key Without Editing

Every setup can have its own AutoSplit Key. The internal setup also has an AutoSplit Key that determines where the split point goes when you make a setup out of a program by adding a layer or split.

You can change the AutoSplit Key without leaving Internal Voices Mode or MIDI Setups mode (you can't layer or split in KB3 mode, so you can't change the AutoSplit Key there either).

1. Press Zone 3 and Zone 4 simultaneously. The display looks like this (the top line is blank):

AutoSplit Key: G#3

2. Use the Alpha Wheel to change the value. You can put it anywhere from C -1 to G 9, but in most cases, you'll want it somewhere within the central range of your keyboard.
Instead of using the Alpha Wheel, you can press and hold Enter, and hit the key that you want to be the split point. This is called Intuitive Entry; see page 4-5 for a full description.
3. Press Zone 3 and Zone 4 simultaneously to return to your previous performance mode.

Changing the AutoSplit Key this way is a performance feature only; as soon as you leave your current performance mode, the change is lost. You *can* save it, however. Read on.

Saving the AutoSplit Key

If you're in MIDI Setups mode, just save the setup, as described in *Saving Quick Layers and Splits* above. If you want to save the AutoSplit Key to the internal setup, follow the procedure described in *Saving the Internal Setup* on page 3-21.

Muting and Soloing

Setups can give you a nice thick sound, with a different program in each of the four setup zones (you can arrange the zones so that they all play on different parts of the keyboard, or you can have them all overlap). You can make your setups even more versatile by muting or soloing zones, changing the sound by pressing a single button.

On page 3-11 we described how the colors of the LEDs in the zone buttons indicate whether zones are muted or soloed. There are several other things to keep in mind.

Muting

You can mute any or all zones in a setup. Muting one zone has no effect on the other zones. To mute (or unmute) a zone, it must be the current zone (the bottom line of the display shows the number of the current zone, followed by the name of the program assigned to that zone). When a zone is current, each press of its zone button toggles between muting and unmuting. If a zone is not the current zone, press its zone button *twice* to mute or unmute the zone (the first press makes the zone current, then each subsequent press toggles between muting and unmuting).

Soloing

Not surprisingly, you can solo only one zone at a time, and that's the only zone you'll hear, regardless of the status of the other zones. When you press the **Solo** button, whatever zone was current at the time becomes the soloed zone (the LED in its zone button turns red). Once the **Solo** button is on, pressing any zone button once solos that zone.

The AutoSplit Feature

Muting and soloing are slightly different depending on whether the AutoSplit feature is on. When it's on, a soloed zone expands to cover the entire keyboard—it doesn't matter what the settings are for the AutoSplit key or for the zones low and high notes (key range). Similarly, if you mute both of the zones above the AutoSplit key, the zones below the AutoSplit key expand to cover the entire keyboard. And vice versa. This is great for performance situations, because you can use the whole keyboard no matter which zone(s) you're using.

When AutoSplit is off, soloed zones remain within the limits defined by the setup. Likewise, unmuted zones stay within their limits if you mute both of the zones on the other side of the split point. This silences part of the keyboard, which isn't as useful as it could be.

By default, AutoSplit is on in the internal setup, enabling you to make quick layers and splits at any time when you're in Internal Voices mode (we recommend that you leave it this way). All of the factory setups have AutoSplit turned off, and when you save a quick layer or split, the resulting setup also has AutoSplit turned off. You can turn it back on for any setup, however, as described on page 4-25.

There's one more thing to remember about AutoSplit. When you make a quick layer or split, you're in a kind of transition between Internal Voices mode and MIDI Setups mode. You start off in Internal Voices mode, but as soon as you press one of the zone buttons, the MIDI Setups button lights up and the Internal Voices button becomes unlit. As long as you stay in this quick-layer-and-split semi-mode, you can mute and unmute each zone with a single button press; you don't have to make the zone current first. It's a nice performance feature. (By the way, soloing works the way it usually does.)

Once you save your quick layer or split, it becomes a regular setup, with AutoSplit turned off. Even if you turn it back on (to make soloed and unmuted zones expand across the entire keyboard), you're no longer in the special quick-layer-and-split mode when you're playing the setup—you're in regular MIDI Setups mode. Consequently, you have to make a zone current before you can mute or unmute it.

Saving the Internal Setup

If you've made a change to the AutoSplit Key, physical controller assignments, or other parameters, and you want to preserve those changes to affect every program in Internal Voices mode, you can save the PC2's current settings to the internal setup. There's more about editing and saving the internal setup on page 4-27.

1. Press **Store** (in the Functions region of the front panel). The display looks something like this:

Save setup 133?
A05 Setup 133

2. Press Internal Voices (in the Sound/Setup Select region). The display looks like this:

Save to
Internal Voices?

3. Press **Yes**. The display briefly shows **Internal setup saved!** then prompts you to select a setup. You can either select a setup by pressing one of the Setup Select buttons, or change to a different performance mode by pressing a mode-selection button twice.

Digital Audio Output

You can use the analog and digital audio outputs at the same time. There are five parameters in the Global menu that control the digital output configuration. You may want to edit some of these parameters, depending on how you're using the PC2's digital output. In many (perhaps most) cases, however, the default values provide the best performance. For more information, see the descriptions of the digital audio output parameters, beginning on page 5-34.

Chapter 4

Programming Your PC2

Basic Editing Concepts

So far we've explained the PC2 primarily from a performance standpoint, covering the fundamentals of selecting programs and setups, and applying real-time controls and effects. There's much more to the PC2, however—you can modify existing programs, setups, and effects in countless ways, or create completely new ones. We call this editing, and there are a few concepts that apply to editing in general, whether you're working on programs, setups, or effects.

Overview

Editing consists of changing the value of one or more *parameters*. A parameter defines one particular component of a program or setup (or the PC2 itself). These parameters are organized into *menus*—groups of related parameters. There are separate menus for programs, setups, effects, and more. There's also a set of global parameters affecting the entire PC2.

For example, in every MIDI setup, each zone has a parameter called MIDI Channel. This parameter's value determines the channel on which the PC2 sends MIDI information. Every parameter has a default value set at the factory.

Beginning to Edit

If you want to change the value of any parameter, there are three basic steps:

- Navigation
- Data entry
- Naming and storing (saving)

Navigation

The first step is to find the parameter you want to edit. This procedure works for editing *any* parameter (there's a short cut for editing controller assignments, which we'll discuss later).

1. Press one of the parameter buttons to select a *menu* (group of parameters). The parameter buttons are labeled in groups: Zone, Sound, and System.
2. Press either of the *cursor* buttons (the buttons labeled < and > under the display) to scroll through the current menu. In most cases, this displays a different parameter and its value, usually on the bottom line of the display. In this case, pressing the cursor buttons is like turning pages in a book. Sometimes, however, there's more than one parameter on a "page." In this case, pressing the cursor buttons will move a cursor (a small flashing underscore) from one parameter's value to another without otherwise changing the appearance of the page.

Data Entry

When you see the parameter you want to edit (or when the cursor is highlighting its value), use one of the data entry methods to change the value. As with selecting programs and setups, there are three ways to do this:

Alpha Wheel	The large dial in the Data Entry region of the PC2's front panel. You can turn it in either direction without limit.
Minus and Plus buttons	Directly under the Alpha Wheel, these buttons (labeled – and +) decrease or increase the parameter's value by one increment. Hold the button to repeat.
Alphanumeric buttonpad	Enter the value by pressing the corresponding numbered buttons, then press Enter . For example, 3 6 Enter changes the value to 36 . +/– 3 6 Enter changes the value to -36 (not the Plus or Minus button, but the button under the 7). You can change a value to negative or positive by pressing +/– any time before pressing Enter .

When using the buttonpad, you can change the value again before pressing **Enter**. Press **Clear** to reset the value to **0**, or press **Cancel** to return to the previous value.

There are several short cuts for data entry that are easy to learn and much faster than the three methods we've described here. We call these methods intuitive entry, because they take a very common-sense approach to entering data. Turn to page 4-5 for a full description.

Naming and Storing

Storing (saving) is optional, of course. If you don't want to store any of your changes, press **Cancel** one or more times to return to the mode you were in before you started editing. Although naming is obviously optional as well, we'll assume you're going to name the object you're editing before storing it.

This procedure describes storing a setup, so it assumes that you're in MIDI Setups mode. The process is similar for naming and storing other objects.

1. Press **Store** (in the Functions group of buttons). The display will show either **Save Setup NNN?** or **Replace Setup NNN?** where **NNN** is the setup ID.
 - If you're in the Internal bank of setups, the display will show **Save setup NNN?** where **NNN** is the first available setup ID in the User bank of setups.
 - If you're in the User bank, the display will show **Replace setup NNN?** where **NNN** is the ID of the current setup. Use any data entry method to change the ID if you want to save a new setup instead of replacing the current one.
2. Press **>** to display **Rename setup NNN?**
3. Press **Yes (Enter)**. The display shows the name of the current setup, if any. The cursor highlights the character that's selected for editing.
4. Use any data entry method to change the current character. The alphanumeric buttonpad is the quickest way. Press the corresponding button one or more times for the desired character—for example, press **1** three times for **C**. Use the **UPPER/lower** button to change the case of the current character. Press **0** one or more times to enter numerals. Press the

cursor buttons to move the cursor to a different character. Press **Clear** to create a space without moving the cursor.

Buttons **SW1-SW3** have special functions when naming things. **SW1** inserts a blank space at the location of the cursor, moving everything after the cursor one space to the right. **SW2** deletes the character at the location of the cursor, and moves everything after the cursor one space to the left. **SW3** moves the cursor to the last character in the name.

5. Press **Yes**. The display again shows either **Save Setup NNN?** or **Replace Setup NNN?**, depending on where you were when you started storing.
6. Press **Yes** (or press **No** if you don't want to store the setup after all). The display briefly shows **Setup NNN saved!** then returns to MIDI Setups mode.

Special Characters For Naming Setups

Following is a list of all of characters available for setup names, in the order in which they are found. The easiest way to get to them is to press one of the alphanumeric buttons to select a character close to the one you want, then scroll to it with the alpha wheel. Here's the whole list:

```
! " # $ % & ' ( ) * + , - . / 0 1 2 3 4 5 6 7 8 9
: ; < = > ? @ A through Z
[ \ ] ^ _ ' a through z (space)
```

Other Save-Dialog Functions

Restoring Factory Effects

If you've changed the effect settings associated with a program, you can quickly restore the factory settings. In the Save dialogs for the Program, KB3, and Effects Editors, there are options for restoring the effects for either the current program, or for all programs (both Internal-Voice programs and KB3 programs).

1. Enter the Save dialog by pressing **Store**. Depending on the editor you're in, you'll see either a prompt to replace the current effect, or to save or replace the current program (voice).
2. Press **<** repeatedly until you see either **Restore Current Factory Effects?** or **Restore All Factory Effects?**
3. Press **Yes (Enter)** to restore, or **No (Cancel)** to cancel.

If you choose to restore the current effect, the PC2 resets only the current program to its factory effect settings. If you choose to restore *all* effects, the PC2 resets all programs (both Internal-Voice programs and KB3 programs) to their factory effect settings.

Deleting Objects

You can delete an Internal-Voice program, KB3 program, setup, or effect by entering the Save dialog for the Program, Setup, KB3, or Effects Editor.

When you enter the Save dialog, you'll see a prompt asking you whether you want to save or replace an object (the object type depends on which editor you're in). The prompt for dumping the object is at another location in the dialog, as you'll see.

1. Enter the Save dialog by pressing **Store**. Depending on the editor you're in, you'll see either a prompt to replace the current effect, or to save or replace the current program (voice) or setup.
2. Press **>** repeatedly until you see a prompt asking you to delete the object.
3. Press **Yes**. The display will show another prompt asking you if you're sure.
4. Press **Yes** again. The display will show **Deleted!** briefly, then return to the performance mode you were in before entering the editor. You'll also see **--Not Found--** in the display, indicating that the object is gone.

At any of these prompts, you can press **No** to cancel the operation.

Dumping Objects

If you've created a lot of programs, setups, and effects settings, you may want to store them externally, using a MIDI System Exclusive (SysEx) dump. This has several benefits: you can load the objects into other instruments that accept SysEx; you can preserve them in a more permanent backup archive (in case anything happens to the PC2's battery-backed memory), and you can create libraries of objects customized for particular performance or recording situation.

You can dump objects to any MIDI recording device that accepts SysEx messages; most MIDI sequencers manufactured today accept SysEx. A SysEx dump can consist of a single object of any type, or all objects of a given type—it can also include *all* user-defined objects. You can initiate most of these dumps from the Save dialogs of the Program, Setup, KB3, or Effects Editor. Each object you dump is a separate SysEx message.

When you enter one of these dialogs, the first thing you see is a prompt asking you whether you want to save or replace an object (the object type depends on which editor you're in). The prompt for dumping the object is at another location in the dialog, as you'll see.

You should prepare your MIDI recording device before initiating the dump. For example, if you're dumping to a sequencer application, open the file to which you want to dump, and get the application ready to record. Make sure you have a MIDI cable connected from the MIDI Out port of the PC2 to the MIDI In port of the recording device. Don't start recording just yet, however.

1. Enter the Save dialog by pressing **Store**. Depending on the editor you're in, you'll see either a prompt to replace the current effect, or to save or replace the current program (voice) or setup.
2. Press **>** repeatedly until you see a prompt asking you if you want to dump a single object, or to dump *all* objects of the current type (the current type is determined by the performance mode you were in when you entered the editor).
3. Start recording with the MIDI recording device, then press **Yes** on the PC2's front panel.
4. The PC2 dumps the object or objects to the MIDI recording device as a normal file. The display indicates when the dump is finished.

Reloading a Dump

1. Connect a MIDI cable from the MIDI Out port of the external device to the PC2's MIDI In port.
2. Initiate the dump or playback of the object file from your external device.

You don't have to put the PC2 in any special mode to receive the dump. When a dump is sent back to the PC2, the information goes to the memory location for the corresponding object types. It does *not* update the edit buffer. Consequently you won't have access to the objects until you select them in one of the performance modes.

For example, suppose you recently dumped an object (we'll assume it's **Setup 129**), but by coincidence you were editing **Setup 129** just before you reloaded it. You might expect to be able to play and edit the reloaded version as soon as you've finished reloading, but in fact, you would be playing the copy of the setup that's in the edit buffer. To play the reloaded setup, return to MIDI Setups mode and select **Setup 129**. Only then will you be able to play the reloaded version.

If you plan to make frequent use of SysEx dumps, you should run at least one test cycle of dumping and reloading before you put a lot of effort into editing. You don't want any surprises, for example, when you have to dump your entire memory to protect it because your PC2's battery is running low.

For example, you might dump a setup, then make a simple change to the version on your PC2 (like renaming it). Reload it, then select it, and check whether the name has reverted to its original. If it hasn't, you haven't reloaded successfully.

Turn to page 4-9 for more information about SysEx dumps.

Intuitive Entry

A significant amount of your editing efforts go toward navigation and data entry: sometimes it's difficult to remember which menu contains a particular parameter, and entering new values for some parameters involves scrolling through long lists of values. Intuitive entry can help with both of these tasks.

Short Cuts for Data Entry

You can use any continuous physical controller—sliders, wheels, or pedals—to change the value of the current parameter very quickly. You can also use the keyboard in some cases. Here are three quick examples.

Transposition

1. Press **Transpose** (from any performance mode).
2. Press and hold **Enter**, and move one of the sliders to set the value.

You can also use the keyboard when transposing with intuitive entry. While holding **Enter**, strike any key. The resulting value is equal to the number of semitones up or down from C 4 (Middle C).

Setting the Key Range of a Zone

1. Press **Key Range**.
2. Press and hold **Enter**, and strike a key. This sets the low key, since the Low parameter is current when you press Key Range.
3. Press **>** to select the Hi parameter.
4. Press and hold **Enter**, and strike a key.

Negotiating Long Lists of Values

This is especially useful when assigning values for physical controllers, since for each controller there are well over a hundred available values.

1. Press **Controllers**.
2. Press **>** to select the Ctrl Num parameter for Wheel 1 Up.
3. Press and hold **Enter**, and move one of the sliders.

In this case, you may want to use intuitive entry to move quickly from one end of the list to the other, then release the **Enter** button and use a standard data entry method to scroll through the list more precisely.

Short Cuts for Navigation

When you're changing the assignments for physical controllers, you can spend a lot of time finding the right parameter, since the Controllers menu contains over a hundred parameters. This is where you can use intuitive entry to its fullest.

Controllers Menu: Instant Parameter Selection

This technique works for *all* the physical controllers, including mono pressure.

1. Press and hold **Controllers** (from any performance mode).
2. Press any switch controller, move any continuous controller, or strike a key and press it as if you were applying aftertouch. This immediately selects the Ctrl Num parameter for the corresponding controller.

Once you've selected the parameter, you can press and hold **Enter**, and move any continuous controller to set its value.

Controllers Menu: Parallel Parameter Selection

You'll recall that every physical controller shares a common set of basic parameters, like Ctrl Num in the previous example. Whatever the current parameter is, you can jump directly to the corresponding parameter for each controller by pressing the cursor buttons simultaneously. Although you can't jump backward in the list, you can always press **Controllers** to return to the top of the list.

MIDI Recv Menu

If you're playing the PC2 from another instrument or a sequencer, you'll use the MIDI Recv menu for enabling/disabling channels and assigning programs, as well as for adjusting volume, pan, and wet/dry settings. Intuitive entry makes it easy to move from channel to channel within the menu.

1. Press and hold **MIDI Recv**.
2. Press any of the Sound/Setup Select buttons (1–16). This selects the first set of parameters (On/Off and program assignment) for the corresponding MIDI channel.

Other Editing Functions

Comparing

Any time you make a change while editing an object, you can easily compare it to the original object, which is extremely useful for determining whether you want to keep the change.

1. Enter an editor, and change the value of a parameter.
2. Press **Compare**. The PC2 restores the previous value of the parameter. To remind you that you're listening to the unedited value, the **Compare** button blinks, and the top line of the display shows **Comp**.
3. Press **Compare** again, and PC2 restores your edited value.

The Compare function focuses on your current change, so you can easily recognize it without hearing the effects of other changes you may have made. Here's an example.

1. In Internal Voices mode, select a program with a crisp attack and a short release. Program **040 Clav Classic** works well for this example.
2. Press the **Envelope** button to enter the Program Editor.
3. Change the value of the Attack parameter to its minimum (crank the Alpha Wheel to the left a few turns). Now you have to hold a key down for the note to reach its full amplitude.
4. Press **Compare**. The display shows the previous value, and you hear the quick attack.
5. Press **Compare** again. The slow attack returns.
6. Press **>** twice to display the Release parameter.
7. Change the value to its minimum. Now both the attack and the release are slow.
8. Press **Compare**. Both the slow attack and the slow release are gone.
9. Press **Compare** again, and the slow attack and release both return.

Copying and Pasting

You can copy setup parameters (zones), controller parameters, and arpeggiator parameters into a buffer, then paste them into other setups. You can also copy effects parameters, and paste them into other setups or programs.

Pasting Parameters Into a Zone

1. Call up the setup whose parameters you want to copy. If you've already entered the Setup Editor, make sure you haven't selected any of the parameters in the Controller menu (if you are in the Controllers menu, you'll copy just the controllers and not the entire zone's parameters).
2. Press **Copy**.
3. Press the zone button for the zone you want to copy.
4. Press **Enter**.
5. Press the **>** button to display the Paste prompt.
6. Press the zone button for the zone you want to paste into.
7. Press **Enter**.

Pasting a Zone Into a Different Setup

1. Call up the setup containing the zone that you want to copy. If you've already entered the Setup Editor, make sure you are haven't selected any of the parameters in the Controller menu.
2. Press **Copy**.
3. Press the zone button for the zone you want to copy.
4. Press **Enter**.
5. Press the **MIDI Setups** button.
6. Select the setup that you want to paste into.
7. Press **Copy**.
8. Press the **>** button to display the Paste prompt.
9. Press the zone button for the zone you want to paste into.
10. Press **Enter**.

Pasting Controller Parameters

1. Call up the setup containing the controller data that you want to copy.
2. If necessary, press one of the zone buttons to make sure that the zone whose controller parameters you want to copy is the current zone.
3. Hold the **Controllers** button and move the controller that you want to copy, to bring up the first parameter for that controller.
4. Press **Copy**, then **Enter**.

5. You have several options for pasting the copied data. Depending on what you want to do, take one of the following steps:
 - To paste the data to the same controller in a different zone, press the appropriate zone button, then press the **>** button to get to the Paste parameter, then press **Enter**.
 - To paste the data to a different controller in the same zone, hold the **Controllers** button and move the new controller. Press the **Copy** button, then the **>** button, then **Enter**.
 - To paste the data to a different controller in a different zone, press the appropriate zone button, then hold the **Controllers** button and move the new controller. (For example, you might want to copy all the Zone 1, Slider A parameters to Zone 2, Slider B.)
 - To paste the data into a different setup, press the **MIDI Setups** button and select the setup you want to paste into. Hold the **Controllers** button and move the appropriate controller. Press the zone button for the appropriate zone. Press the **Copy** button, then the **>** button, then **Enter**.

Keep in mind that you can copy and paste only into similar controllers; the parameters for a switch controller can go only to another switch controller, and those for a continuous controller can go only to another continuous controller.

Pasting Arpeggiator Parameters

1. Call up the setup containing the arpeggiator data that you want to copy. Press the **Arpeggiator** button.
2. Press **Copy**, then **Enter**.
3. Press the **MIDI Setups** button. Select the setup that you want to paste into. Press the **Arpeggiator** button.
4. Press the **Copy** button. Press the **>** button, then **Enter**.

You should be aware that this will copy only the parameters in the Arpeggiator menu. It won't copy any controllers assigned to arpeggiator functions like Arp Latch or Arp Switch.

More About SysEx Dumps

SysEx IDs

If all you're doing is dumping objects from your PC2 to a sequencer and loading them back, you won't have to worry about the PC2's SysEx ID. Just make sure that you don't change it after dumping objects, because you won't be able to reload them if the PC2's SysEx ID is different from the one contained in the incoming messages.

The SysEx ID for the PC2 is defined by the Device ID parameter in the Global menu.

Dumping the Entire Memory

1. Make sure that you have a MIDI connection from the PC2's MIDI Out port to the MIDI In port of your external device.

2. Press the **Global** button, then press the **>** button until you see **Dump all Objects?**
3. Start recording on your external device, and press **Enter** on the PC2. The LED in the **MIDI Xmit** button blinks and the display shows you the object being dumped. The PC2 indicates when it's finished dumping, at which time you can stop recording on the external device.



A note for K2000/K2500/K2600 users: The sequencer in the K2000/K2500 has a 64K maximum for storing files. A dump of the entire PC2 memory is larger than 64k, so you can't use this method to load objects into a K2000, K2500, or K2600. Instead you must dump individual objects. If you need to dump all your PC2 objects, you can dump them into several different songs.

The Program Editor

If you press one of the buttons in the Sound Parameters region of the front panel, you enter the Program Editor, where you can make changes to a wide variety of parameters that affect individual programs.

Program Editing Basics

You'll remember from *Basic Editing Concepts* on page 4-1 that the general procedure for editing involves three steps: navigation (selecting the parameter you want to edit), data entry (making the edit), and storing your changes—either replacing the current program, or creating a new one, renaming it as well if desired.

Programs contain from one to four layers, each of which can have a different sound, and its own complete set of sound parameters. Don't confuse the layers that constitute a program with the layers you make using the AutoSplit feature (which are really MIDI Setup zones, as described on page 3-17). When you're editing a program, you can't *add* layers, but you can change existing layers using any of the sound parameters.

Let's take a quick tour of one of the program-editing menus, to familiarize you with the fundamentals of the Program Editor. Start by calling up Program 000 **Stereo Grand**. Press **Internal Voices**, then press the **Internal** Sound Source button, then press **0** on the alphanumeric buttonpad, then press **Enter**.

Entering the Program Editor

Press any of the buttons in the Sound Parameters region of the front panel to enter the Program Editor. For our get-acquainted tour, we'll look at the Timbre menu. Press the **Timbre** button, and the display looks like this:

Lyr:1 LP Filt[1]
Freq: F#5 740Hz

The Timbre menu contains parameters that affect the nature of the sound in the current program. The parameter you see now controls the cutoff frequency of a lowpass filter, one of the two DSP (digital signal-processing) functions contained in each program. You can't change which DSP functions are associated with a program, but you can change the values for the existing functions.

By the way, you might think the display says **E#**, not **F#**. Actually, what you see is the cursor under the **F**. Turn the Alpha Wheel a couple of clicks to the left, and you'll see the cursor under the value.

The Current Layer

Notice the zone buttons. In the Program Editor, they represent the layers of the current program. In Program **000**, there are three layers. When you enter the Program Editor, all the existing layers in a program are active (green LEDs). Unlit LEDs indicate nonexistent layers.

Pressing a zone button makes the corresponding layer the *current* layer. The display shows the number of the current layer. The current layer is the only one you can edit; to edit another layer, make it the current layer. The **Previous Group** and **Next Group** buttons also change the current layer.

Now let's navigate through the Timbre menu. Press the left cursor button (<) repeatedly until the display stops changing. The display looks like this:

Lyr:1 Keymap L >>
5 Piano mp Left

Keymaps

This shows you the *keymap* for the current layer. Every layer has a keymap assigned to it (*two* keymaps if the program uses stereo keymaps). The keymap is the most basic component of a program; it determines (among other things) which samples or waveforms the program plays. Change the keymap, and you have a different sound. If you wanted to make the current program an organ, for example, you'd change all the keymaps organ keymaps.

Program **000** uses stereo keymaps, so in each layer there are separate keymaps for the left and right sides. Press the right cursor button (>), and you'll see the keymap for the right side. Most of the PC2's programs use *mono* keymaps, which means that only one of the keymap parameters is active. If you look at the keymap parameters for a mono-sample program (like any of the electric pianos) you'll see parentheses around one of the parameter names. That's the *inactive* keymap; you can't change its value.

Program **000** is also a multi-velocity program; each layer represents a different keystrike velocity. Press **Zone 1**, **Zone 2**, then **Zone 3**, and you'll see that Layer 1 is the soft-strike piano (mp), Layer 2 is medium (mf), and Layer 3 is hard (f). Let's listen to each layer separately.

Muting and Soloing Layers

Press the **Solo** button, and you're soloing the current layer (notice that its layer LED turns red, and an asterisk appears in the display next to the layer number). Press **Zone 3** to solo Layer 3. Now play a key softly; you should hear nothing. Keep playing louder, and eventually you'll hear the notes.

Press **Solo** again to deactivate soloing. Press **Zone 2** twice. The first time you press it, Layer 2 becomes the current layer. The second time you press it, you mute Layer 2 (its LED turns orange). Now start playing softly, and gradually play harder. You'll hear notes at first, then they'll drop out as your playing triggers muted layer, then you'll hear notes again as you trigger the loud layer.

Exiting the Program Editor

There are several ways to get out:

- Press **Cancel**
- Press **Store** to begin the Save dialog; when you've finished saving, the PC2 returns to Internal Voices mode, in the User bank of programs
- Select a performance mode, program, or setup by pressing a mode-selection button followed by either a sound-source button or a Sound/Setup Select button
- Select a performance mode by pressing a mode-selection button twice

Storing Effects

If the value of the FX Chg Mode parameter is **Auto** (which is the default), the Effects region acts as part of Program Editing mode. If you change the effect assigned to FX-A or FX-B, or if you edit one of those effects, or if you change any of the values for the Wet/Dry mix, you can store those changes in one of two ways:

- Replace the effect settings in the current program
- Save the program and the new effect settings to a new program ID

See *The Effects Editor* on page 4-21 to learn how to edit effects.

Beyond the Basics

Now that you've had an introduction to program editing, it's time to experiment. If you're interested in a particular editing task, there's a good chance you'll find it in *Common Editing Tasks* on page 4-25. To learn about the specifics of each parameter, see *Program Editor Parameters* on page 5-1.

The Setup Editor

The Setup Editor lets you make changes to setups, then store the modified setups in the User setup bank. The PC2 comes from the factory with 34 setups, all in the Internal bank. The User bank is empty, so the first time you go into the Setup Editor, you'll be editing one of the setups in the Internal setup bank. The PC2 won't let you store setups in the Internal bank, but you can store them anywhere in the User bank, either replacing the setup you started with, or assigning it a different setup ID.

In this section, we'll use a number of practical examples to help you learn your way around the Setup Editor. All the setup editing you'll do involves these basic steps:

- Selecting a setup
- Entering the Setup Editor
- Changing the values of one or more parameters
- Storing (saving) the setup

You should already know how to select a setup. If not, see *Selecting Programs and Setups* on page 3-13. You should also be familiar with the three basic steps of editing: navigation, data entry, and storing. See *Basic Editing Concepts* on page 4-1 if you need to refresh your memory.

Before we begin with the details of setup editing, we'll mention two useful setups that can help you keep track of your editing efforts.

The Default Setup and the Clear Setup

Naturally you can edit any setup you want, changing values for any of the dozens of available parameters. Here's something to consider, however: the factory setups often have complex interactions between several parameters. Changing the value of one parameter can have a greater impact than you anticipated. Consequently, we've made it easy for you to keep things simple.

In the Internal setup bank are two template setups: **127 Clear Setup**, and **128 Default Setup**. Setup **128** has a handful of typical controller assignments (Wheel 1, the Pitch Wheel, for example, controls pitch bend just as you would expect it to). **Setup 127** is completely "blank"—that is, it has no controller assignments whatsoever.

As you learn to edit setups, you're likely to find it easier to keep track of things if you start with one of these setups and make a few changes at a time. As you learn what kinds of features you like in your setups, you can store them in the User bank, and use *them* as templates for further editing.

In any case, the examples we provide in this section begin with Setup **128**, and build from there. In each example, we'll refer to the setups we create using the names we suggest in the examples.

Entering the Setup Editor

1. Press the **MIDI Setups** button to enter MIDI Setups mode.
2. Select a setup by pressing one of the Setup Select buttons, or by using your favorite data entry method.
3. Press any of the buttons in the Zone Parameters region of the front panel.

Creating Setups

If you've read *Layering and Splitting* on page 3-17, you know how to create layered setups using the AutoSplit feature. Doing it this way, however, adds a lot of other features to the resulting setup, and you may not want that. Sometimes it's better to start from scratch.

1. Start by selecting Setup **128**.
2. Press the **Zone 1** through **Zone 4** buttons in turn. As you press each button, notice how the bottom line of the display shows you the corresponding zone number.

You'll also notice that every zone already has a program assigned to it. That's fine, because you can always mute zones (or turn them off). In fact, all the zones are muted now (their zone buttons are orange). You muted Zone 1 when you pressed its button, because it was the current zone. Let's shut two of the zones off, to make the setup as simple as possible.

3. Press the **MIDI Xmit** button. You're now in the Setup Editor.
4. Press the **Zone 3** button. The display looks like this:

Zone:3- 0:105
MIDI Channel: 03

The top line indicates the current zone, as well as the current bank and program ID. Notice the minus sign after the zone number, indicating that the zone is muted.

5. Turn the Alpha Wheel to the left until you see **Off** in the bottom line of the display. Notice that the **Zone 3** button is now unlit, indicating that the zone is off.
6. Repeat Steps 4 and 5 for Zone 4. You now have a two-zone setup (the setup still has four zones, but two of them are completely inactive).
7. Press the **Zone 1** button to make Zone 1 the current zone.
8. Press the **Program** button, and you should see **000 Stereo Grand** on the bottom line of the display. If you don't, select it using your favorite data entry method.
9. Press the **Zone 2** button to make Zone 2 the current zone. Press it again to unmute it.
10. Select the program **064 Lyrical Strings**.
11. Press **Store** to display the Save dialog:

Save Setup 129?
A01 Default Setup

Notice that the PC2 suggests a setup ID of **129**, which is the first unused setup ID in the User bank. We'll use that ID, but we'll rename the setup before storing it.

12. Press **>**, and the display prompts you to rename the setup. Press **Yes**.
13. Press **SW2** repeatedly until you've erased the entire name (this is optional; you can also write over each existing character in turn, if you prefer).
14. Enter a name that you can remember, because we'll refer to it in later examples. Use the alphanumeric buttonpad and the **>** button to select characters and move the cursor. We'll call this setup **Piano&Strings**. Refer to *Naming and Storing* on page 4-2 if you need a reminder about naming objects.

You can get to the **&** character by pressing the **Plus** button under the Alpha Wheel six times when the cursor is highlighting a blank character space.
15. When you've entered the name, press **Yes**. The Save prompt returns. Press **Yes** again to save the setup.

Setting Initial Volume Levels for Different Zones

Suppose you want the program in one zone of a setup to be at a lower volume than the others. We'll edit our two-zone setup to lower the volume of the strings.

1. Start with Setup **129 Piano&Strings**, which we created in the previous example.
2. Press the **Controllers** button. The display probably looks like this:

Zone:2 0:064
Entry Volume: 127

3. Press **7, 5**, then **Enter**.

4. Play a few notes. If you don't hear a difference, press **Compare** and play some more. Press **Compare** again to stop its LED from blinking.
5. Press **Store** to display the Save dialog. Notice that the display prompts you to replace Setup 129. We don't want to do this.
6. Press the **Plus** button, and the display will prompt you to save Setup 130.
7. Rename the setup as **EntryVol**, and save it at ID 130.

Assigning Sliders to Control Wet/Dry Mix in Different Zones

1. Start with Setup 130 **EntryVol**, which we created in the previous example.
2. If Zone 1 isn't the current zone, press the **Zone 1** button to make it current.
3. Press and hold the **Controllers** button and move Slider A. The display looks like this:

Zone:1 Slider A
Ctrl Num: None

4. On the alphanumeric button pad, press 9, then 3, then **Enter**. This assigns Slider A to send FXAWet. (MIDI Controller 93), which controls the wet/dry mix for the FX-A effect block.
5. Press the **Zone 2** button to make Zone 2 the current zone.
6. Press and hold the **Controllers** button and move Slider B.
7. Press 9, 1, **Enter** to assign Slider B to send FXBWet (MIDI 91).
8. Play the keyboard and move the two sliders. You should hear the level of the effects (a chorus controlled by Slider A and a reverb controlled by Slider B) change as you move the sliders.
9. Save the setup as **131 SliderFX**.

Assigning Entry Values

Suppose you have a setup with an effect whose wet/dry mix is controlled by a slider. You want to make sure it's active when you start playing the setup. Entry values are a convenient way to specify initial settings for any controller. We'll edit **SliderFX**, and set an entry level for Slider A in Zone 1 so that the wet/dry mix of the chorus is at about 75% as soon as we select the setup.

1. Start with Setup 131 **SliderFX**. Make Zone 1 active, if it isn't already.
2. Make sure that the send for FX-A is active. If the FX-A button isn't lit, press it. In fact, let's make sure that both effect sends are active when we select the setup.
3. Press **FX-A** and **FX-B** simultaneously. Both LEDs should be lit.
4. Press **Store**. You'll see a prompt asking if you want to replace Setup 131. Press **Yes**. You've saved the effect-send settings as part of the setup. Now let's set the entry value for Slider A in Zone 1.
5. Press and hold the **Controllers** button and move Slider A. You'll see the Ctrl Num parameter for Slider A in Zone 1.

6. Press **>** repeatedly until you see the Entry Value parameter. Set its value to **85**.
7. Save the setup as **132 EntryFX**.

A Few Important Points About Entry Values

Crossing the Entry Value

Suppose that Slider A happens to be all the way up when you select Setup **132**. Wet/dry mix is now at 85 on Channel 1. Now you want to use the slider to fade the chorus out. If you move the slider, you don't want it to suddenly jump to the current value; since the slider is all the way up (set to 127), it would jump to 126 the moment you moved the slider down and the chorus would suddenly get wetter.

To avoid this problem, the PC2 is designed so that once you set an entry value for a physical controller, it won't become active until you pass the point of the entry value. So as you move Slider A down for Setup **132**, nothing happens until you reach 85. At that point, the slider kicks in, giving you a smooth fade.

Avoiding Extra Controller Motion

Now suppose you want to have a piano-and-strings setups like Setup **132**, but you don't want to hear the chorus at all when you select the setup. Instead, you want to bring it in later. To do this, you could set the entry value for Slider A in Zone 1 to **0**.

Imagine that the slider is all the way down when you first call up the setup. Remember that the slider must go past the entry value before it becomes active. In this example the entry value is **0** and the current position of the slider is also at MIDI 93, value 0 (minimum). When you move the slider up, the MIDI 93 value goes to 1, and therefore hasn't *crossed* the entry value, and therefore nothing happens as you move the slider up. You'd have to move the slider up slightly, then back down so that it goes to MIDI 93 value 0, then the next time you move it up, the slider will be active. To avoid having to move the slider up, down, and up again, set the entry value to a very low number other than **0**, such as **5**. The value is so low that you won't hear the chorus, but as you push up the slider the first time, it will go past 5 and become active.

Setting Exit Values

Suppose that you're using Setup **132** in a performance, and you finish a tune by fading out the chorus with Slider A. Its MIDI Controller value is now 0, and will stay at 0 until you move the slider again, or until something else forces it to move.

Unless, of course, you reset Channel 1's wet/dry mix somehow. That's where exit values come in; they let you specify MIDI Controller values when you *leave* a setup. We recommend that you get in the habit of setting exit values for physical controllers *whenever* you set entry values.

This is less of a problem for some controller, like volume and wet/dry controls, since the PC2 has default entry values for these controllers. It's just something to keep in mind when you're creating your own setups.

Let's revisit Setup **132**, and specify some exit values.

1. Select Setup **132**. We'll assume that Zone 1 is current.
2. Press and hold **Controllers** and move Slider A.

3. Press **>** until you see the Exit Value parameter.
4. Set a value of **127** (wet/dry mix of 100%).
5. Save the setup, this time replacing Setup **132** without renaming it.

Multiple Controller Function

Here's your next scenario: You want to add a layer of electric piano to Setup **132**, and you want Slider **A** to control the wet/dry mix of both the acoustic and the electric piano. But you want the acoustic piano's mix to be drier than the electric piano's mix at all times.

1. Select Setup **132**. First, we'll bring the entry value of the chorus back up to **127**.
2. Press **Zone 1**, then press and hold **Controllers** and move Slider **A**.
3. Press **>** until you see the Entry Value parameter for Slider **A**.
4. Press and hold **Enter** and push any slider all the way up). Now you're ready to add the electric piano.
5. Make Zone 3 the current zone (press **Zone 3**).
6. Press **MIDI Xmit**.
7. Turn the Alpha Wheel three clicks to the right to assign Zone 3 to transmit on MIDI Channel 3.
8. Press **Zone 3** to unmute the zone.

Since Zone 3 is going to be almost identical to Zone 1, we'll copy Zone 1 and paste it into Zone 3.

9. Press **Copy**. The display shows a prompt asking you if you want to copy Zone 3 (because Zone 3 is the current zone). You don't. You want to copy Zone 1.
10. Press **Zone 1**, then **Enter**. The display shows **Zone copied!** and returns to the Copy prompt. (This makes Zone 1 current, by the way.)
11. Press **>**. The display shows a prompt asking if you want to paste to Zone 1.
12. Press **Zone 3**, then **Enter**. The display shows **Zone pasted!** and returns to the Paste prompt.
13. Take a minute to save the setup as **133 Offset**. You'll see why we chose that name in a minute.
14. Press **Program**, then Sound Select 3 to assign an electric piano to Zone 3.
15. Make Zone 1 current (press **Zone 1**).
16. Press and hold **Controllers**, and move Slider **A**. Press **>** until you see the Ctrl Offset parameter.
17. Press **6, 4, +/-, Enter**. This sets an offset of -64 for slider **A** in Zone 1. The offset uniformly subtracts 64 from the value of the slider (a *positive* offset would uniformly *add* to the value). When the slider is all the way up, the value is $(127 - 64)$ or 63. therefore, the acoustic piano will always have a wet/dry mix that's 64 lower than the electric piano.

18. Save again, replacing Setup 133 without renaming.

As you move the slider down to the midpoint, the Controller value of the wet/dry mix for the electric piano is 64, and the value for the acoustic piano is 0 (64 – 64). In the bottom half of the slider's throw, you'll hear chorus only on the electric piano.

Offset vs. Scale

There's another way to adjust levels relative to each other that gives slightly different results.

1. Select Setup 133 if necessary, and press **Controllers**. Make Zone 1 current, if it isn't already.
2. Set the offset for Slider A in Zone 1 back to 0.
3. Press < once, then press 5, 0, **Enter**. This sets a scale of 50% for the wet/dry mix.

Whereas an offset provides a uniform difference between the wet/dry mix for the acoustic and electric pianos, scaling creates a proportional difference. As you move Slider A down from the top, the difference in the wet/dry mix values between the two sounds gets smaller, until they meet at 0.

Crossfades

You can use a single continuous controller to fade one sound out while it fades another sound in. This is called a crossfade.

1. Create a two-zone setup, as you did in the example on page 4-13. Use a sustaining sound in each zone: perhaps two different organs. (If you want, you can use Setup 129, and change the piano to an organ.)
2. Press and hold **Controllers**, and move Slider A. Make Zone 1 current, if it isn't already (press **Zone 1**).
3. Make Zone 2 current (press **Zone 2**).
4. Press >, then change the value of the Ctrl Scale parameter to **-100%**.
5. Press >, then change the value of the Ctrl Offset parameter to **127**.

That's all it takes to create a crossfade. You'll notice a bit of a drop in volume at the midpoint between the sounds. You can adjust that.

1. Starting from the previous example, press >, then change the value of Ctrl Curve to **Cos+**.
2. Make Zone 1 active, and change its Ctrl Curve parameter to **Sin+**. Notice the difference?

Explaining why this works can get a bit technical. The easy explanation is that the **Sin+** curve boosts the volume in the midrange, while the **Cos+** curve *cuts* the volume in the midrange—but since we've inverted the curve with scaling and offset, it also boosts the volume in the midrange.

Velocity Switching

You can use your keystrike velocity (how hard you play) to change sounds. This is how program **000 Stereo Grand** works: there are actually three sets of samples, one for soft, one for medium, and one for loud.

1. Create a two-zone setup. Assign program **22 Soft E Piano** to Zone 1, and program **23 Hybrid E Piano** to Zone 2. Make Zone 1 current if it isn't already.
2. Press **Velocity**. Press **>** four times to select the **Max** parameter. Set its value to **80**. Note that the **Min** value for Zone 1 is **1**. This is good.
3. Make Zone 2 current. Press **<** to select the **Min** parameter. Set its value to **81**. Note that the **Max** value for Zone 2 is **127**. This is also good.

The soft piano plays at velocities from 1 to 80, and the Hybrid piano plays from 81 to 127. This gives you a nice thunk when you play hard. You can create three- and four-zone setups to switch between even more sounds.

Velocity Layering

Another use for the velocity parameters is to add a layer instead of switching between layers. To do this, have one layer play at velocities from 1 to 127, and another at velocities from 100 to 127. For the higher-velocity layer, use a program with a percussive attack, and possibly bring its entry volume down for a more subtle mix (you can use the entry- and exit- value approach we discussed on page 4-14, or you can simply set the **Entry Volume** parameter for that layer to something less than **127**).

Switching Setups With a Pedal

This is great for performances, enabling you to switch setups while you hold the last chord of the tune you're playing. For this example, you'll need a switch pedal plugged into the **Switch Pedal 2** jack (any jack will do, but the **Switch Pedal 1** jack is preset to provide sustain, which you probably want to keep).

1. Create a setup with one or more zones.
2. Press and hold **Controllers**, and step on switch pedal 2 (the one connected to the **Switch Pedal 2** jack). This brings up the **SwType** (switch type) parameter for **Switch Pedal 2** in Zone 1. The default value of **Toggle** is OK. Make another zone current if you prefer; you can use any zone.
3. Press **>** to select the **On Ctrl** parameter. Change the value to **GoToSetup** by pressing **1, 4, 1, Enter**. This is one of several special functions outside the range of the 128 MIDI Controller messages. Don't confuse it with MIDI Controller messages.
4. Press **>** to select the **On Value** parameter. Set its value to match the setup ID of the setup you want to select.
5. Save! If you press **Switch Pedal 2** before you save, you'll change setups, and your edits will get erased.

You can use a value of **Setup Inc (1, 3, 9, Enter)** for **On Ctrl**, and a value of **127 (MIDI On)** for **On Value** to step up to the next setup ID. If you do this for a string of consecutively-numbered setups, you can cruise through them without taking your hands off the keys. You might also use

the previous technique on the highest-numbered setup in this sequence to take you back to the lowest-numbered setup in the sequence.

In this same sequence of setups, you could use Switch Pedal 3 with On Ctrl set to **Setup Dec (1, 4, 0, Enter)** and On value of **127** to step *down* one setup at a time.

Transposing a Setup With a Button

If you don't have the time to learn a tune in a different key, you can have the PC2 transpose a setup with one press of a button. This example transposes up a fourth, but it's up to you to decide both the direction and the interval (if you want to transpose down an octave, try the **Octave Shift** button (**SW1**), which works for many programs and setups).

1. Create a with one or more zones. Make Zone 1 current.
2. Press and hold **Controllers**, and press one of the switch buttons (make sure to choose one that isn't doing something you need for the setup—we'll assume you use **SW5**). This displays the SwType parameter for **SW5** in Zone 1. The default value of **Toggle** is OK.
3. Press **>** to select the On Ctrl parameter. Press **1, 4, 5, Enter** to set a value of **Trans Up**.
4. Press **>** to select the On Value parameter. Set its value to **5**.
5. Press **>** to select the Off Ctrl parameter. Notice that the PC2 has automatically set its value to match the value you've set for On Ctrl. Convenient.
6. Press **Plus** to set the Off Ctrl parameter to a value of **Trans Down**.
7. Press **>** to select the Off Value parameter. Set its value to **5**.
8. Repeat this procedure for all zones in the setup (unless you want to transpose some zones and not others).

The KB3 Editor

In the KB3 Editor, you have access to the parameters that affect the sound of the current KB3 program. These parameters are described beginning on page 5-27.

Editing the Percussion Parameters

When editing the percussion parameters, you have to have percussion enabled in order to hear the effects of your edits. Similarly, the *combination* of percussion effects you want to edit must be active as well. For example, if you want to hear the effect of editing the Perc Ld/Fast parameter, you have to have both the high-volume and fast-decay effects activated.

The zone buttons control which of the effects are active. The **Zone 1**, **Zone 2**, and **Zone 3** buttons control the combination of Loud/Soft (Volume) and Fast/Slow (Decay) parameters. The Pitch parameters—activated by the **Zone 4** button—are independent of the others, but being able to hear edits to the Low Harm and High Harm parameters depends on having the low-pitch or high-pitch effects activated. The following table illustrates how the Loud/Soft and Fast/Slow parameters interact—that is, which effects must be active in order for you to hear the differences resulting from editing the corresponding parameters.

Zone 1 Status	Zone 2 Status (Volume)	Zone 3 Status (Decay)	Corresponding Parameter Group
Off	Irrelevant	Irrelevant	None (all percussion effects off)
On	Off	Off	Sft/Slow
	Off	On	Sft/Fast
	On	Off	Ld/Slow
	On	On	Ld/Fast

The Effects Editor

The Effects Editor has two functions: changing the effects associated with the current program or setup (or the entire PC2), and modifying the nature of the effects that are currently in use.

Effects Change Mode

The effects change mode determines whether the PC2 automatically selects effects when you select a program or setup. The effects change mode is controlled by the FX Chg Mode parameter, which you can select by pressing the **FX Mode** button in the Effects region of the front panel. By default, this parameter's value is **Auto**, which means that regardless of your performance mode, the PC2 automatically selects the effects associated with whatever object you select—a program or a setup. FX Chg Mode is closely tied to the FX Channel parameter, which determines whether a program change on a particular channel can also change the current effect.

If you change the value of FX Chg Mode to **Panel**, the PC2 *doesn't* automatically select effects when you select a program or setup, and the only way to change the effects is to select them manually using the **Select** buttons for FX-A and FX-B. When you set FX Chg Mode to **Panel**, the FX Mode button's LED lights up to indicate that effect selection is "locked," and the effects you select manually apply to whatever program or setup you select, regardless of your performance mode.

Setting the Effects Change Mode

In virtually all cases, you can leave both FX Chg Mode and FX Channel at their default settings (**Auto** and **Current**). There's one case, however, in which you might want to change them.

Applying Effects Globally

Suppose you're in the studio, and you want to use the same reverb settings regardless of the programs or setups you play. In this case, set FX Chg Mode to **Panel**, which prevents program changes (either from the PC2 or via an external MIDI source) from changing any effects settings. The only way to change the current effect is by using the **Select** buttons for FX-A and FX-B, and changing the effect assignment manually.

There's another important point to remember about using **Panel** as the value for FX Chg Mode: you can still edit the current set of effects, but you can't save them to the current program or setup. Our explanation of the Effects Editor assumes that you have FX Chg Mode set to the default setting of **Auto**.

See *Effects Change Mode (FX Chg Mode)* on page 5-25 for a more detailed description of FX Chg Mode.

Entering the Effects Editor

You can get to the Effects Editor from any performance mode by pressing the **Select** button for FX-A or FX-B (in the Effects region). The display looks something like this:

FXA Select : Voices
1 Nice Little Booth

In this case, we've entered the Effects Editor from Internal Voices mode, by pressing the **Select** button for FX-A. The FX-A LED lights to indicate that it's the current effect block. The top line of the display indicates that we've come from Internal Voices mode (you'd see **Setups** or **KB3** in the top line if you had come from MIDI Setups mode or KB3 mode, or **Panel** if the value of FX Chg Mode were set to **Panel**). The bottom line shows the ID and name of the effect assigned to the current effect block.

You can also get to the Effects Editor when you're in the MIDI Recv menu, by pressing the **Select** button for FX-A or FX-B. To get back to the MIDI Recv menu, press and hold **MIDI Recv**, then press one of the Sound/Setup buttons. This returns you to the MIDI Recv menu, on the channel corresponding to the number of the Sound/Setup button you pressed.

Selecting Different Effects

On page 3-15 we briefly described performance aspects of changing effects. Here we'll go into a bit more detail.

1. Enter the Effects Editor as described in the previous subsection.
2. Use any data entry method to change the effect displayed on the bottom line.

This procedure applies to any performance mode, as long as you're using one of the standard effects in both effect blocks. Things are a bit different if you're using one of the specialized KB3 effects (IDs 395 and 396). Only the KB3 programs use these effects by default, but you can apply them to any setup or program if you want.

The KB3 effects are complex multi-stage DSP functions that use the FX-A and FX-B blocks in tandem (to accommodate the extra processing requirements). In this case, the **Select** button for FX-A serves to select the special double-block effect, and the **Select** button for FX-B is inactive. Anything routed to FX-B therefore bypasses the KB3 effect. When you're using a KB3 effect in one of the zones or channels of a setup, you might want to route the other zones or channels to FX-B (unless you want the KB3 effect applied to all zones or channels of the setup).

If you press the **Select** button for FX-B when editing a program or setup that uses one of the KB3 effects, the ID and name of the current effect are enclosed in parentheses, indicating that you can't change it. If you select one of the standard single-block effects (using the FXA/B Select parameter), the FXB Select parameter becomes active again.

You can change the effect associated with the current program or setup as often as you like without actually affecting the program's or setup's definition. Unless you save your changes, the original effect gets reapplied to the program or setup as soon as you exit the Effects Editor. See *Saving Effects* on page 4-23 to learn how to save the current effect settings to the current program or setup.

Editing Effects Parameters

Most effects have four parameters that control various aspects of the effect (the special KB3 effects we mentioned above have three additional parameters that we'll describe at the end of the following procedure). Our sound engineers determine which parameters go with which effects, but you can edit the values of any of the effects parameters.

1. Select the effect you want to edit, using the FXA Select or FXB Select parameter (or FXAB Select for programs or setups using one of the KB3 effects).
2. Press **>** (the right cursor button) one or more times to select one of the four parameters associated with the current effect.
3. Use any data entry method to change the value of the current parameter.
4. If desired, save your changes, as described in *Saving Effects* on page 4-23.

KB3 Effects

The double-block KB3 effects we mentioned in *Selecting Different Effects*—the ones with IDs **395** and **396**—are associated by default with every KB3 program (remember that you can use them with *any* program or setup if you want). These effects have two special properties that set them apart from the standard single-block effects.

In addition to the usual four parameters (accessible by pressing the **Select** button for FX-A, then pressing **>** one or more times), these effects have three parameters that are accessible by pressing the **Select** button for FX-B, then pressing **>** one or more times (actually, they have *four*, additional parameters, but one of them is called *None*, and you can't change its value).

Also, there's a special editing case. If the KB3 effect you're editing is assigned to a KB3 program *and* the FX Chg Mode parameter is set to **Auto** (which is the default), you'll notice that when you press the **Select** button for FX-A, then press **>** multiple times, the first three parameters don't have values; instead of values you see **(Program)**. That's because in this special case, the values of these three parameters are determined by the program settings, as described below:

Vibr/Chor	Vibrato/Chorus (which is what the VC stands for in the names of some of these effects). Change this value by pressing SW3 (Chorus/Vib Depth) one or more times.
Low Rate	The vibrato rate when SW1 is off (unlit LED) in KB3 mode. Change this value using the Rotor Effects Low Rate parameter in the LFO menu of the Program Editor.
High Rate	The vibrato rate when SW1 is on (lit LED) in KB3 mode. Change this value using the Rotor Effects High Rate parameter in the LFO menu of the Program Editor.

If the KB3 effect you're editing is assigned to a setup or an Internal-Voices program—or when it's assigned to a KB3 program but FX Chg Mode is set to **Panel**—you can change the values of these three parameters within the Effects Editor.

Saving Effects

If you've made changes while in the Effects Editor, you must store the changes if you want to preserve them when you leave the Effects Editor. The basic procedure is as follows, although you have different options depending on whether you're working with programs or setups, and whether you're in the Internal bank or the User bank. We'll get to that in a minute. For now we'll assume that you've edited the effects for a program in the *Internal* bank of Internal Voices mode.

1. Change the effects as desired (either assign a new effect to one or both effect blocks, or edit the parameters associated with one or both of the current effects).
2. Press **Store** (in the Functions region of the front panel). The Save dialog appears, looking something like this:

RePlace Effects 30?
Digital E Piano

The top line shows the ID of the program whose effects you've changed, and the bottom line shows the program's name.

3. Press **Yes**, and the display tells you that the effects are saved to the current program.

You've modified the factory settings of the current effect, but *only with respect to Program 030*. The effect retains its factory settings in other programs or setups that use that effect. So you've really modified only the current *program*, overwriting its factory settings (don't worry; you can get them back, as described in *Restoring Factory Effects* on page 4-3).

You don't *have* to modify the factory programs when editing effects; you can create a new program in the User bank instead.

1. Repeat Steps 1 and 2 from the preceding procedure. When you see the Save dialog, press **>**. The Save dialog changes:

Save Voice N?
Digital E Piano

N stands for the lowest-available program ID in the User bank for Internal Voices mode. At this point, you can either proceed to the next step, or use any data entry method to select a different program ID. If the ID is unused, the dialog doesn't change. If you select an ID that already has a program assigned to it, **Save** changes to **RePlace**.

2. Press **Yes** to save to the current program ID (or rename the program first, as described on page 4-2).

If you've entered the Effects Editor from the *User* bank of Internal Voices mode, the Save dialog starts by asking if you want to replace the current effect assignment for the current program (just as it does for programs in the Internal bank). If you press **>**, the Save dialog doesn't jump to the lowest-available program ID in the User bank; it asks you if you want to replace the current program. Again, you can use any data entry method to select a different ID. The dialog says **Save** or **RePlace** depending on whether you select an ID that's already in use.

The Save dialog operates in exactly the same way if you enter the Effects Editor from either the Internal or User bank in KB3 mode. If you're coming from MIDI Setups mode, the dialog is a bit different, since setup effects are stored as part of the entire setup, not its constituent programs. Consequently, the dialog doesn't ask you if you want to replace the current effect; it asks you if you want to save the setup (if you're coming from the Internal bank) or replace the setup (if you're coming from the User bank). Otherwise, the Save dialog operates the same as it does for Internal Voices mode and KB3 mode.

Other Effects-Editor Functions

There's more to the Effects Editor's Save dialog than just storing the results of your editing. You can also do the following:

- Dump effects via MIDI System Exclusive messages to an external MIDI recording device
- Restore the factory settings for the effects of the current program (applies to programs in the Internal bank of Internal Voices mode and KB3 mode; doesn't apply to setups or to programs in any User bank)
- Restore the factory settings for the effects of *all* programs in the Internal banks for Internal Voices mode and KB3 mode (doesn't apply to setups or to programs in any User bank)

We describe all of these procedures in *Other Save-Dialog Functions* on page 4-3.

Common Editing Tasks

Making Effects Active at Program or Setup Selection

Many programs and setups activate the sends to either FX-A or FX-B when you select them. It's easy to save them with different combinations of active sends. We'll use an Internal-Voices program as an example, and we'll activate both sends.

1. Select a program. We'll assume that the send to FX-A is already active.
2. Press FX-A and FX-B simultaneously. Both buttons light up.
3. Press the **Wet/Dry** button, or the **Select** button for either FX-A or FX-B. This informs the PC2 that you want to store an effect, and not a setup.
4. Press **Store**, then press **Yes** to save to the program. The next time you select the program, both effect sends will be active.

Turning AutoSplit On and Off

The AutoSplit feature is on by default for all programs in Internal Voices mode (it's part of the internal setup). In MIDI Setups mode, AutoSplit is off for most factory setups, but you can turn it on if you want. AutoSplit is not available for KB3 mode. Here's how to turn it on and off.

1. In MIDI Setups mode, press **Key Range** (in the Zone Parameters region). The key-range parameters (Low and Hi) appear.
2. Press > three times. The AutoSplit parameter appears. Change its value as desired.
3. Press **Store**. The Save dialog appears, prompting you to save the change to the lowest available setup ID. You have two options:
 - Press **Yes** to save the change to the current setup (of course, you can change the setup ID and name before saving if you want)
 - Press the Internal Voices button; this brings up a prompt asking if you want to save the change to Internal Voices—we'll assume you do, so press **Yes**

In the former case (saving to a setup) you create a new setup with AutoSplit either on or off as you specified—or if you change the setup ID to that of an existing setup, you replace that setup.

In the latter case (saving to Internal Voices), you save the new setting to the internal setup, thereby enabling or disabling AutoSplit for all Internal-Voices programs. When you're in Internal Voices mode, AutoSplit is so convenient that we recommend that you always leave it on (it's the factory default setting). In MIDI Setups mode, there are advantages and disadvantages to having AutoSplit on. See *The AutoSplit Feature* on page 3-20 for more information.

Controlling Vibrato and Tremolo with LFOs

While you can't add an LFO to a program (LFOs are permanently linked to certain programs at the factory), you can modify the LFOs' effects on the programs that do use them. Many factory programs and setups make use of the LFOs for vibrato, tremolo, or rotor effects. In many Internal-Voices programs, you can bring in the vibrato or tremolo with the Mod Wheel.

Using Mono Audio Output

If you have a monaural sound system, or have only one available input to your mixer, you might want to play your PC2 in mono mode, in which case the full audio signal gets sent to both sides of the analog outputs (there's no separation of left and right).

1. Press **Global**, then press **>** 17 times to select the Output Mode parameter.
2. Set its value to **Mono**.

Changing Preset Drawbar Values

Making Drawbars Live

1. In KB3 mode, press **Timbre**, then press **>** three times to select the DrawbarMode parameter.
2. Set its value to **Live**.

Changing the Values of Preset Drawbars

1. In KB3 mode, press **Timbre**, then press **>** four times to select the first of the nine Drawbar parameters (Drawbar 1). Notice the cursor.
2. Use any of the drawbar controls (Sliders **A–D** and the Mod Wheel) to change the value of the corresponding parameter. Press the **Drawbar Toggle** button to enable the sliders to change the values for drawbars 1–4 (**Drawbar Toggle** button's LED is off) or 5–8 (button's LED is on).
3. Save the program.

The next time you select the program, your edited values will be in effect. You'll still be able to change them temporarily in real time using the drawbar controls (Sliders **A–D** and the Mod Wheel).

Editing the Internal Setup

You can edit the internal setup and store your changes, thereby changing the zone parameters for every program. As an example, we'll transpose the internal setup up an octave.

1. Make sure you're in Internal Voices mode. If you're not, press **Internal Voices** twice.
2. Press **Transpose**. The display looks like this:

Zone: 1 auto 0:000
TransPosition: 0

The top line shows the current zone, along with the bank number and program ID. The second line shows the Transposition parameter and its current value. In this case, the AutoSplit feature is on, as indicated by the word **auto**.

Note that the performance mode changes to MIDI Setups. That's because the zone parameters are normally for editing setups; editing the internal setup is a special case.

3. Change the value of the Transposition parameter to **12** with any data entry method. If you play a note, you'll hear the transposition.
4. Press **Store**. The display prompts you with **Save setup NNN?** (NNN is the lowest available setup ID.)
5. Instead of answering **Yes** or **No** as you would when editing a setup, press the **Internal Voices** button. The display now says **Save to Internal Voices?**
6. Press **Yes**, and the display says **Internal setup saved!** After a few seconds, the display changes and prompts you to select a setup. Press **Internal Voices** twice to return to Internal Voices mode.
7. Select a few different programs, and you'll notice that they're all an octave higher when you play them. If the PC2 is receiving MIDI information from an external source, those notes continue to play without transposition.

Using the Arpeggiator

The arpeggiator takes input from the PC2's keyboard (or via MIDI) and turns it into a constant rhythmic pattern. You can control the speed and nature of the pattern in real time. The arpeggiator resembles what were called "sequencers" on old analog synths—playing a finite series of notes repeatedly, with changes in the series controlled by the notes you play. The arpeggiator can affect both the PC2 and external MIDI instruments. The notes produced by the arpeggiator in a given zone go to all of that zone's destinations: local, MIDI, or both.

The concept behind the PC2's arpeggiator is fairly simple, although the options are extensive. You might think of it as a "note processor," generating complex output from relatively modest input. You can select any number of notes for the input, and tell the arpeggiator to recognize and remember them. This is called "latching" the notes. The arpeggiator then processes them by playing them repeatedly, and/or transposing them up and down the keyboard. You have control over several processing parameters: tempo, velocity, order, duration, transposition, and whether the intervals between notes are filled chromatically. You can also tell the arpeggiator how to deal with new information coming from the keyboard. The settings you define in the arpeggiator menu apply to all zones for which arpeggiation is activated; you can program each zone individually to respond to or ignore the setup's arpeggiation values.

Figure 4-1 shows the processing order the PC2 uses to create arpeggios from your input:

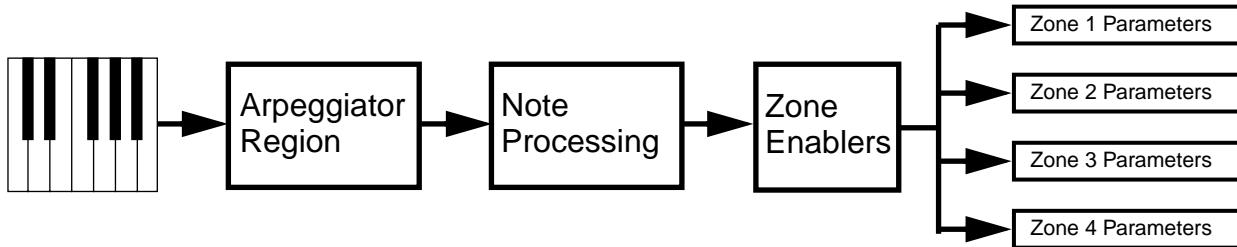


Figure 4-1 Arpeggiator Processing Sequence

Many of the PC2's factory setups make use of the arpeggiator—for example, those that include notes in the setup's name, like setup 001 Dance C 7. There are others as well; you'll know them when you find them.

The PC2's arpeggiator can be a lot of fun to play with; you can get many interesting and unusual effects. You can use the arpeggiator in both Internal Voices and MIDI Setups mode. We'll start with Internal Voices mode, but if you find a specific set of parameter values that you like, you can simply press the **Store** button to save the settings as a single-zone setup.

1. Start in Internal voices and call up any sound that you want to work with. To best hear the effects of the arpeggiator, you might want to start with a program that has a percussive attack, such as piano, marimba, or guitar.
2. Press the **Arpeggiator** button. Turn the Arp Active parameter **On**. Play a chord on the keyboard. You should hear the notes arpeggiated. If you hear nothing at all, go to the Global menu and check to make sure the Clock parameter is set to **Internal**. If you hear notes but they aren't arpeggiated, Go back to the Arpeggiator menu (if you've left it), then press the **>** button three times to make sure Zone Enable is **On**. Press **>** once more to make sure Latch Mode is set to **Keys**.

Try playing a single note. Notice that it is repeated. Try adding more notes. As you press them they are added to the arpeggio. Let go of one of the keys. Notice that note is dropped from the arpeggio while the others continue. Notice that the arpeggiator plays the notes in the specific order that you strike them. Also notice that the loudness of the arpeggiated notes depends on how hard you strike the keys.

Hold the sustain pedal and let go of the keys. Notice that even though the notes ring out like they would when you press the sustain pedal, the arpeggiation stops. In order for the arpeggiator to work, the keys must be held down, or otherwise latched (see the descriptions of the arpeggiator parameters beginning on 5-19).

3. Press the **<** or **>** button, until you see the Low and Hi parameters. Press **>** again, if necessary, to move the cursor under the Hi parameter. Hold **Enter** and strike Middle C to set the Hi parameter to **C 4**. Now play a chord in the bass and a melody in the treble. Notice that any notes up to **C 4** are arpeggiated but all notes above that are played as normal. The Key Range parameter lets you set a range of notes which will be affected by the arpeggiator while others can be played regularly. Hold **Enter** and strike the top key to put the arpeggiator back to playing across the keyboard.

4. Press **>** to select the Zone Enable parameter. This enables you to arpeggiate one or more setup zones, and play others normally. Several of the preset setups do this.

Using Pressure (Aftertouch) as an Arpeggiator Controller

In this example, we'll use pressure to control the volume of arpeggiated notes.

First, make sure that keyboard aftertouch is sending the Pressure Controller message. Hold the **Controllers** button, strike any key and press down on it. The display will change to show **Zone:1 Mpressure, Ctrl Num: Pressure**. If it doesn't, press **132**, then **Enter** to assign the MPressure controller (your keyboard aftertouch) to send Pressure.

Aftertouch is somewhat similar to the Pitch Wheel, in that it functions like a spring; it returns to **0** as you let go of the key. Like the sliders, wheels, and continuous control pedals, you can assign aftertouch to send any MIDI controller number. However typically, aftertouch is assigned to Pressure, which is a separate MIDI message.

One final thing to understand: There are actually two different types of aftertouch: Mono Pressure and Poly Pressure. Mono Pressure has a single strip running across the keyboard, so pressing down on any note will generate controller info that will affect *all* the notes played on that MIDI channel. Poly Pressure has a separate sensor for each key so pressing down on a key only affects that key. The PC2 uses Mono Pressure.

Press the Arpeggiator button, then press **>** until you see the Vel Mode parameter. Set its value to **Pressure**. Now when you hold down keys, the volume of each arpeggiated note is controlled by how hard you press on the keys.

Using the Arpeggiator with a Sequencer or External Controller

If you are sequencing and create a setup that uses the arpeggiator, the PC2 will send the actual notes that were generated by the arpeggiator to the sequencer. When you play back the sequence, it simply sends back those notes and does not actually play the arpeggiator itself.

But if, for some reason, you need to have the sequencer or other external controller send notes to the arpeggiator itself, you must use the Remap function. To do this, press the **Global** button, then press **>** until you see the MIDI In parameter. If you set this to **Remap**, then *all* incoming MIDI note messages will be treated as if you played those notes on the keyboard of the PC2 itself.

The MIDI channel info on the incoming data is ignored; The PC2 simply takes the note numbers and sends them to each zone based on the note range settings for that zone. It's the same as playing that note on the keyboard itself. So you probably wouldn't want to send more than one channel of MIDI information from an external controller, since the note messages will get mixed together.

Another thing to be aware of is that all controller messages will be sent to all zones. So, for example, if you have a setup with zones assigned to Channels 1, 2, 3, & 4, then a sustain message coming in would be sent to all four MIDI channels.

Using the PC2 to Control External Slaves

Anything you play or transmit from the PC2 can control an external keyboard or module in addition to—or instead of—the PC2’s internal sounds. There is really only one parameter you need to set.

1. Start with Setup 128 **Default Setup**. Press the **MIDI Xmit button**. Set the channel to the channel number that you wish to use to control your external slave.
2. Press the **>** button. Set the Dest parameter to **MIDI**.
3. Edit any other parameters you need to control your slave (such as setting the bank and program change, controller settings, etc.).

When you set the Program parameter for zones assigned to MIDI only, the Program parameter will display **External Program**, since—of course—the PC2 doesn’t know the names of the programs on your external slave. But you will always see the program and bank numbers.

If you want to make a setup that layers PC2 sounds with external sounds, the simplest way to is to set some zones to MIDI (to play the external slave) and other zones to Local (to play the PC2). It’s possible to have a zone set to Local+MIDI (and in fact the default does just that). In this case, one zone can play both the PC2 and external slave.

Sending Bank-Select and Program-Change Messages

This feature is useful when you’re using the PC2 to control other instruments or a sequencer, in which case you’ll be sending lots of program-change messages via MIDI. Since many instruments contain multiple banks or programs, you’ll also be sending bank-select messages.

You’ll need to know which MIDI message the receiving devices use for selecting banks (it’s usually MIDI 0 or MIDI 32 with a value from 0 to 127; many instruments, including the PC2, can accept MIDI 0 *and* MIDI 32 as a single bank-selection message, allowing you to select banks numbered from 0 to 16,383).

1. Type the number of the bank you want to select. You can enter a number from 0 to 16,383 (not all instruments can handle numbers higher than 127, however).
2. Press the **-/+** button (it’s also labeled **UPPER/lower**). The top line of the display now shows you the bank number you entered, followed by **:0**.
3. Type the ID of the program you want to select.
4. Press **Enter**.

For more information, see *Understanding Bank-Select Controllers*.

Understanding Bank-Select Controllers

Most newer keyboards have more than 128 different programs, but MIDI allows only 128 values for the Program Change message. The bank-selection controller enables you to have multiple banks of programs: each program bank can store up to 128 programs.

There are actually *two* bank-selection controllers: Controller 0 and Controller 32. Some manufacturers use just 0, some use just 32, and some use both. Since each bank-selection controller can have 128 values, that means that the total number of possible banks is

$128 \times 128 = 16,384$ (numbered as 0–16,383). Since each bank can have 128 programs in it, that means the total number of possible programs in an instrument is 2,097,152! In practice, most instruments tend to have 10 or fewer banks.

By default, the PC2 responds to Controller 0 with a value of **0**, followed by Controller 32 with a value corresponding to the desired bank (although you can use either controller). There are four standard program banks, numbered **0–3**, and four KB3 banks, **4–7**. When working with external slaves, you may find they require very different values for the banks. Many Roland keyboards, for example, use values of **80** or **81** for Controller 0.

The PC2 actually has a transmit parameter called Bank Mode, within the Program menu. This allows you to choose either **0 or 32** or **0/32** for an individual zone. However, if the value of this parameter is not the same as the Bank Sel Ctl (Bank Selection Control) reception parameter found in the Global menu, it causes the PC2 to display the bank values in a very confused manner. Therefore, we recommend that you leave the Bank Mode parameter set at the default value of **0/32**, which is the same as the default Global Bank Sel Ctl value.

If you have an instrument like a Roland, which responds only to Controller 0 for bank selection, you have to know how to calculate the bank number. Controller 0 is the Most Significant Byte (MSB) and Controller 32 is the Least Significant Byte (LSB). If you see the two bank controllers together, they are normally shown as MSB/LSB. This means that you count by incrementing the number in the LSB column before incrementing the MSB. In essence, you are counting in base 128. To make it obvious for the majority of us who prefer to think in base 10, the following numbers show how the banks increment:

Controller 0/32 Value	Bank Number
0/0	0
0/1	1
0/2	2
...	...
0/127	127
1/0	128
1/1	129
...	...
2/0	256
...	...

When you've selected the Bank parameter in the PC2, the display shows you both the **0/32** value and the bank number equivalent. With other parameters selected, the display shows only the bank number equivalent, followed by a colon (:), followed by the program number. To scroll through all the bank numbers with the Alpha Wheel can take a long time, so you will probably want to enter the bank number on the alphanumeric buttonpad.

To figure out which bank number equivalent you need, follow this formula:

$$\text{MSB} \times 128 + \text{LSB}$$

Using the Roland example, if they require you to send Controller 0 with a value of 80 and no value of Controller 32, then you would have $80 \times 128 + 0 = 10,240$. With the Bank parameter selected, if you type **10240**, then press **Enter** when you are on the Bank parameter, you will see the display show both 80/0 and 10240.

Another example: If the Roland required you send Controller 0 with a value of **81** and Controller 32 with a value of 2, then you would have $81 \times 128 + 2 = 10,370$. Again, entering **10370** for the Bank parameter will show both 81/2 and 10370.

Sending Program Changes Only

Imagine that you're playing the PC2 and another keyboard at the same time. You want to be able to change programs on the second keyboard when you change setups on the PC2, so you need to send MIDI to the second keyboard. You don't want to send note information, however, since you're actually playing the second keyboard (and not slaving it from the PC2). You can easily create a setup that sends program change information, but doesn't play notes on the receiving instrument.

1. Press the **MIDI Setups** button, then **127**, then **Enter**. You have called up **Clear Setup**. Press **Copy**, then **Enter**. You have now copied a zone from this setup into the edit buffer.
2. Press **MIDI Setups**, then **128**, then **Enter**. You have called up **Default Setup**. Press **Copy**, Press the **>** button. The display should now say **Paste into zone 1?** Press the **Zone 2** button, then **Enter**. (The display will say **Zone Pasted**, then revert back to **Paste into Zone 2?**) You have now pasted all the parameter values from Zone 1 of Setup **128** into Zone 2 of Setup **127**.
3. Press the **MIDI Xmit** button. Set the MIDI channels that you want for zones 1 and 2. Press the **>** button. Set zone 1 to **Local** and zone 2 to **MIDI**.
4. Press the **Program** button and choose the programs that you want for zones 1 and 2.
5. Make sure that the display is on zone 2. Press the **Key Range** button. Press the **>** button twice to get to the Note Map parameter. Press **0**, then **Enter** to set it to **Off**.
6. Name and save your setup.

Now when you call up the setup, it will send a program change to your second keyboard, but since the note map for that zone (and therefore MIDI channel) is turned off, no note information is sent to the external keyboard when you play the PC2.

This procedure is also an example of the Copy and Paste feature. You pasted all the settings and assignments from the Clear Setup (which has all of its controllers disabled) into the setup you were editing. This is a quick way to make sure that you don't accidentally send controller information to the second keyboard; if you had copied a zone with controller assignments, those assignments would affect the second keyboard as well.

You can use this technique to send program changes to any device, like an effects processor or sequencer. You can also use the same technique for zones assigned to the PC2 itself! Let's say you have two keyboards. On the PC2 keyboard, you want to play an internal program or programs (up to three). On your external keyboard, you want to play its own sounds and also play a program from the PC2. But your external keyboard doesn't have the abilities the PC2 has for calling up different programs. So you create a zone in the PC2 setup to call up the internal sound you want, but set the Note Map for that zone to Off. So when you call up the setup, it chooses the sound you want to be played from the external keyboard, but the PC2 won't play that zone.

Preventing Program Changes on Slaves

This is the opposite of the previous tutorial. What if you have an external module or keyboard that you want to play from the PC2, but you don't want to send program changes to it? (Maybe you want to leave that module always on the same sound, or you want the ability to choose the sounds directly from the front panel of that external module or keyboard).

1. Create a two-zone setup. Set Zone 1 to **Local** and Zone 2 to **MIDI**.
2. Make sure the display is on Zone 2. Press the **Program** button. Press the **>** button.
3. Set the Entry Transmit parameter to a value of **Off**.
4. Name and save this setup. Now when you call up the setup, it won't send any program changes to your slave, but the note and controller info will still be sent.

Working With an External Sequencer

To state the obvious, you need to have MIDI cables going from the Out of the PC2 to the In of the sequencer or MIDI interface, and the In of the PC2 hooked to the Out of the sequencer.

Turn Local Control Off!

This is the first thing you need to do when using *any* keyboard hooked to *any* external sequencer. This is to avoid causing a MIDI loop problem. If the Patch Thru function of the sequencer (sometimes referred to as Soft Thru or Echo) is turned on, the sequencer takes all information coming into the MIDI In port and sends it back out the MIDI Out port on whatever MIDI channel is assigned to the currently recording track.

If you don't turn local control off, the note gets played twice—once by the PC2 playing itself and once by the note going out to the sequencer and coming back. By turning local control off, the keyboard sends data out the MIDI Out port only, and not to itself. So the signal just goes to the sequencer and is sent back, and does not get played twice.

Some software sequencers (Cakewalk is one example) will send the Local Control Off message automatically when you boot up the program. If your program doesn't do this, you'll need to do it yourself. There are two ways to do it: the global method, and the setup method.

Global Method

1. Press the **Global** button
2. Set the Local Control parameter to **Off**.

This shuts off every connection between the PC2's sound engine and its keyboard and controllers. In other words, the PC2 no longer sends any MIDI information to itself. This method is quick, but you may find the setup method more useful in the long run.

Setup Method

Start from **Setup 128 Default Setup**. Press the **MIDI Xmit** button and select a MIDI Channel (it really doesn't matter which one, but Channel 1 is a logical choice). Press the **>** button. Set the Destination to **MIDI**.

Name and save the setup—you might want to name it something Like **Local Off** or **Seq Control**.

Now you have a MIDI-only setup with a single zone—which is equivalent to being in Internal Voices mode with the Local Control parameter turned off.

There are several advantages to the setup method. First of all, the Local Control parameter sets itself to **On** each time you power up the PC2. The second reason is that you can edit the MIDI-only setup to assign controllers to specific values useful for sequencing.

The final reason has to do with selecting programs. A typical way to choose programs for each recording track is to choose them in your sequencer—by selecting them manually, or by inserting bank-select and program-change messages in each track.

Many people prefer to make these program changes on the receiving instruments themselves, which you can do very conveniently on the PC2 using the MIDI Recv menu—but not if you've used the quick method to turn local control off globally.

If you have the MIDI-only setup, however, you can leave the Local Control parameter set to **On**, enabling you to use the MIDI Recv menu to select programs for each channel. So when you're sequencing, just call up the MIDI-only setup, and you're ready to go.

Recording to a Sequencer While in MIDI Setups Mode

Setups transmit MIDI information on multiple MIDI channels, playing different programs on different channels. This is the same thing a sequencer does: you have different tracks, sending information on different channels. But on most sequencers, a track can be assigned to a single channel only. Therefore one track can't play a setup; it can play only a program.

To record a setup, you must set a sequencer to multi-record. Typically this involves recording to two or more tracks simultaneously, with each track set to a different channel. (There are some sequencers that let you multi-record to a single track, and the sequencer keeps the various channels of information separate even though they are on one track.) As you record into the sequencer, the data is then routed to different tracks depending on what channel the information is on. Then once you play back the sequence, each track plays the individual programs on the different channels, exactly the same way you played them in the setup.

You will have to consult your sequencer manual to find out how to set it up for multi-recording. You should also remember that if a zone in your setup has the Destination parameter set to **Local**, the information won't be sent to the sequencer.

Troubleshooting

If you run into problems while playing or programming, there are several things you can do to help troubleshoot the problem.

First of all if you are not getting the expected results from your programming or are having strange results when hooked to an external device, you can use the MIDIScope utility to see exactly what MIDI messages are being received by the PC2's sound engine.

Press the **Global** button, the press **>** until you see **MIDIScope**. (Or you can hold the **>** button and it will quickly scroll through the parameters.) Then press **Enter**. The display says "MIDIScope Any Button Quits." Now the display will show every MIDI message that the sound engine of the PC2 receives, whether that message comes from PC2 itself or from the MIDI In port. You will see exactly what type of message it is along with the value of that message. For example, a Note On message will show you the note number, along with the attack velocity. A Controller message will show the controller number along with the controller value. It also

shows you the MIDI channel of the message. To leave MIDIScope, just press any non-programmable button.

The only limitation of MIDIScope is that it can display only one message at a time. Therefore it can be confusing if you are sending multiple channels of information at the same time. If you are testing the PC2 itself, it's best to mute all the zones but one so that you can see what info that zone is sending (or you could use the **Solo** button). If you are testing info coming from an external source, such as a sequencer, you would also want to mute all the tracks but one.

If you suspect a physical problem with the PC2, you can use the diagnostics to test it.

Chapter 5

Descriptions of Parameters

This chapter contains a description for each of the PC2's editing parameters. They're organized into the following sections:

- Program Editor Parameters 5-1
- Setup Editor Parameters 5-5
- Effects Editor Parameters 5-24
- KB3 Editor Parameters 5-27
- System Parameters 5-30

Within each of these sections, the descriptions are organized according to the order in which they appear in the editing menus. We've included lists of values only where necessary to explain what those values mean.

For quick reference to all parameters, their possible values, and (where applicable) default settings, see *Parameter Reference* on page B-3 (Appendix B).

Program Editor Parameters

There are three primary menus in the Program Editor, represented by the buttons in the Sound Parameters region of the front panel. Each layer has an independent set of these three menus:

Timbre	The basic nature of the sound
Envelope	Attack, decay, and release times
LFO	Two low-frequency oscillators that you can use to modulate programs during performance; also the rotor effects for Internal-Voice organs and KB3 organs

The Effects region also acts as an adjunct to the Program Editor, enabling you to replace a program's effect settings, or save edited effects as part of a new program. See *The Effects Editor* on page 4-21 for more information about saving effects to programs. Also see page 5-24 for a description of all Effects-Editor parameters.

The Timbre Menu

The parameters in the Timbre menu control the most basic components of the sound in a program. There's a separate set of Timbre parameters for each program layer.

Keymap

The keymap for programs using mono keymaps (most keymaps are mono keymaps). This parameter appears as << **Keymap** R for programs using stereo keymaps.

Descriptions of Parameters

Program Editor Parameters

Keymap L >>

The keymap for the left side of programs using stereo keymaps. This parameter appears as **(Keymap)** for programs using mono keymaps, and is inactive (you can't change its value).

<< Keymap R

The keymap for the right side of programs using stereo keymaps. It appears as **Keymap** for programs using mono keymaps, and is the only active keymap parameter.

Key Range Low, Key Range Hi

These parameters set the lowest and highest notes for the layer.

DSP Parameters

Each layer uses a set of DSP (digital signal-processing) functions that you can use to modify the sound of the layer. Every layer of every program is assigned a set of DSP functions (and associated parameters) at the factory; you can't change which parameters are associated with each layer, but you can change the *values* of the parameters.

Every layer has a total of two DSP parameters. Some layers use two single-parameter DSP functions, while others use one two-parameter function. For example, Layer 1 of the program **Classic E Piano** uses two separate lowpass filters, each of which has a single parameter for setting the cutoff frequency. All the layers in the program **Retro Roto** use a two-pole lowpass filter with parameters for setting cutoff frequency and resonance.

Layers that use single-parameter functions include numbers in their names to distinguish them from each other. For example, in Layer 1 of **Classic E Piano**, there's LP Filt[1] and LP Filt[2]. These numbers don't appear in the parameter names of two-parameter functions.

Not all layers use their allotment of DSP functions. They have one or two parameters called **None** to indicate the absence of DSP functions. You can't change the values of these parameters.



*Note: When you press the **Timbre** button, the first parameter you see is the first DSP parameter. To get to the preceding parameters in the Timbre menu, press < one or more times.*

Volume (Amp)

Independent amplitude control for the layer. Use this parameter to make one layer softer or louder than the others.

Initial Value (Init Value)

Sends MIDI Controller messages with the specified value when you select the program. For example, if you want to hear the full effect of the Mod Wheel on a layer as soon as you start playing, set the init value of the Mod Wheel parameter to **127**.

Keep in mind that these initial values have an effect only under one or both of the following conditions:

- The program is defined at the factory to use one or more of the MIDI Controllers listed below to modify the program in some way
- The physical controller assignments for the internal setup use one or more of the same MIDI Controllers to modify all programs in some way

You can set initial values for the following MIDI Controllers:

Mod Wheel (MIDI 1)	MIDI 12
Breath (MIDI 2)	MIDI 13
Data (MIDI 6)	MIDI 29
MIDI 9	

You may be wondering why you can set initial values for *these* MIDI Controllers and not others. It's because most of the PC2's programs use at least one of these MIDI Controllers to do something (a common example is MIDI 1, which the Mod Wheel sends by default, and which controls vibrato or tremolo in many programs). Appendix B contains a list of programs and which MIDI Controllers the physical controllers are assigned to in each program.

The Envelope Menu

There are three parameters in the Envelope menu. They control how the amplitude of each layer develops over time.

Attack

How fast the layer ramps up to full volume

Decay

How fast the layer fades to silence when you're sustaining notes by holding the keys or using the sustain pedal

Release

How fast the layer fades to silence when you release notes by letting up the keys or releasing the sustain pedal

These parameters control the *rate* of attack, decay, and release, which are known collectively as the *envelope* of a sound. Each parameter is measured as a multiple of 1, which is the unadjusted rate (that's why there's an *x* after the value). Higher values mean a *higher rate*, which means that *less time* elapses during the corresponding segment of the envelope. For example, if you want notes to linger a long time after you let up the keys, set the Release parameter to a low value.

The LFO Menu

There are eight parameters in the LFO menu. Four of them control two LFOs (low-frequency oscillators). The other four control the rotor effects of the organs in Internal Voices mode, and the rotor effects of the KB3-mode organs. In many programs, the LFOs are activated by the Mod Wheel; they add a vibrato or tremolo effect when you push the Mod Wheel up.

The LFOs are permanently linked to various sound-modulation functions, which vary from program to program. These functions are in turn controlled by various physical controllers. For example, most of the organs in Internal Voices mode use the Mod Wheel to change the speed of rotary-speaker effects (which are produced by LFOs), while the KB3 organs use **SW1 (Rotary Fast/Slow)** for the same purpose (although the KB3 organs don't use the LFOs—they have a separate set of rotor-effect generators).

Descriptions of Parameters

Program Editor Parameters

Adjusting the values of the LFO parameters modifies how the LFOs affect the programs that use them (not all programs make use of the LFOs). See *MIDI Controllers* on page B-9 to learn which programs have functioning LFOs.

Many programs use LFO1, which is always *local*, meaning that the LFO affects just one layer of the program. The other LFO is called LFO2 in some programs, and GLFO in others. LFO2 is always *local*, while GLFO is *global*, which means that it uniformly affects every layer in the programs that use it. In other words, if you change the value of a GLFO parameter in one layer, that value remains constant regardless of which layer you select while editing the program. The detailed description of the LFO parameters begins on page 5-3.

LFO1 Rate

The number of oscillation cycles per second (Hz) for LFO1. Changing the value makes the LFO run faster or slower.

LFO1 Shape

The waveform of the oscillation. Changing the value changes the nature of the LFO's effect on the sound.

LFO2/GLFO Rate

The number of oscillation cycles per second (Hz). Changing the value makes the LFO run faster or slower.

LFO2/GLFO Shape

The waveform of the oscillation. Changing the value changes the nature of the LFO's effect on the sound.

The LFO Menu: Rotor Effects Parameters

The rotor effects simulate the popular Leslie rotating speaker that has become a standard addition to the B-3 organ. The KB3 effects all use rotor effects. You can add rotor effects to other programs by saving one of the KB3 effects to those programs.

The rotor effects have two pairs of parameters. Each is responsible for emulating the two speakers (high and low frequencies) that make up the original Leslie rotating speaker.

Rotor Effects Low Rate

Oscillation cycles per second (Hz) for the low rotor. Negative values reverse the phase without changing the rate.

Rotor Effects Low Adjust

The amount of change in the rate of the low rotor when you switch the rotor's speed control from fast to slow or vice versa. KB3 programs use **SW1** to switch rotor speed.

Rotor Effects High Rate

Oscillation cycles per second for the high rotor. Negative values reverse the phase without changing the rate.

Rotor Effects High Adjust

The amount of change in the rate of the high rotor when you switch the rotor's speed control from fast to slow or vice versa. KB3 programs use **SW1** to switch rotor speed.

Setup Editor Parameters

There are seven menus in the Setup Editor, represented by the buttons in the Zone Parameters region of the front panel. With one exception, each zone in a setup has an independent set of these seven menus (the exception is the Arpeggiator menu, in which all parameters but Zone Enable affect all zones in a setup):

MIDI Xmit	Various MIDI-related features (like what MIDI channel each zone uses)
Program	Bank and program assignments, and other program-related parameters
Key Range	Activation/deactivation of keys, pitch control
Transpose	Uniform pitch-shifting of entire zone
Velocity	Response to your playing style
Controllers	Functions of physical controllers (wheels, sliders, ribbon, pedals, buttons)
Arpeggiator	Activation/deactivation and control of arpeggiator

The Effects region also acts as an adjunct to the Setup Editor, enabling you to modify the effects associated with a setup. See page 5-24 for a discussion of Effects-Editor parameters.

Each zone in every setup has an independently-programmable set of Setup-Editor parameters; when you change a value for one of these parameters, you're affecting only the current zone in the current setup (except for the Arpeggiator parameters, which affect the entire setup). Always check to make sure you've selected the zone you want to edit before you make changes.

If you want to reprogram the internal setup, use the Setup Editor to edit Zone-1 parameters, then save your changes to the internal setup, as described on page 3-21 and page 4-27.

Throughout this section, we'll refer only to setup editing. Remember, however, that any changes you make to Zone 1 in the Setup Editor can also be applied to the internal setup.

The MIDI Xmit Menu

The parameters in the MIDI Xmit menu control several aspects of the MIDI information that the PC2 generates. By default, the MIDI Xmit parameters affect both the PC2 and external MIDI equipment. This is true in all performance modes. By changing the value of the Dest parameter, you can make these parameters affect only the PC2, or only external MIDI equipment.

MIDI Channel

Determines which MIDI channel the current zone uses. Use a value of **Off** to disable a zone. In the default setup, each zone corresponds to the zone number (Zone 1 uses Channel 1, Zone 2 uses Channel 2, and so on).

Destination (Dest)

Determines whether the zone transmits only to the PC2, only to MIDI, or to both. The default-setup value is both (**Local+MIDI**). If you set the value to Local, the zone sends it MIDI

Descriptions of Parameters

Setup Editor Parameters

information only to the PC2. If you're using the PC2 to control other instruments or to record to an external sequencer, use a value of **MIDI** or **Local+MIDI**.

Bend Range, Semitones (BndRng ST)

Sets the number of semitones of pitch bend applied by any physical controller that sends either the Pitch Up, Pitch Down, Pitch, or Rvrs Pitch MIDI Controller message, when that controller is at its maximum (sending a value of 127). In the default setup, the Pitch Wheel controls pitch bending.

The value of this parameter gets added to the value of BndRng ct. You can think of BndRng ST as a coarse adjustment, and BndRng ct as a fine adjustment. For example, if you want the maximum amount of pitch bend to be slightly more than a whole note, set BndRng ST to 2, and BndRng ct to a relatively low number like **10**.

In the default setup, BndRng ST is **2**, and BndRng ct is **0**, so pushing the Pitch Wheel all the way up bends the pitch two semitones up, and pulling it all the way down bends the pitch two semitones down.

Bend Range, Cents (BndRng ct)

Sets the number of cents (100ths of a semitone) of pitch bend applied by any physical controller that sends either the Pitch Up, Pitch Down, Pitch, or Rvrs Pitch MIDI Controller message, when that controller is at its maximum. The value of this parameter gets added to the value of BndRng ST. In the default setup, BndRng ct is **0**.

Auxiliary Bend 1, Up (AuxBnd1 Up)

Sets the number of semitones of upward pitch bend applied by any physical controller that sends AuxBnd1 (MIDI 21), when that controller is at its maximum. In the default setup and the internal setup, the ribbon controller is set to send AuxBnd1.

Auxiliary Bend 1, Down (AuxBnd1 Dwn)

Sets the number of semitones of downward pitch bend applied by any physical controller that sends AuxBnd1 (MIDI 21), when that controller is at its maximum. In the default setup, the ribbon controller is set to send AuxBnd1.

Auxiliary Bend 2 Range (AuxBnd2 Rng)

Sets the number of semitones of pitch bend applied by any physical controller that sends AuxBnd2 (MIDI 15), when that controller is at its maximum. In the default setup, there aren't any controllers set to send AuxBnd2.

The Program Menu

Bank

When you select this parameter, the top line of the display shows the current zone of the setup you're editing, as well as the bank ID and program ID of the program assigned to the zone. The bottom line shows the ID and name of the bank that the current zone uses.

This parameter selects the bank for the current zone. It also determines which bank-select value the zone sends via MIDI when you select the setup (the zone won't send a bank-select message to the MIDI Out port if it has a value of **Local** for the Dest parameter in the MIDI Xmit menu).

Program ID and Name (No parameter name shown)

When you select this parameter, the top line of the display shows the current zone of the setup you're editing, as well as the bank ID and program ID of the program assigned to the zone. The bottom line shows the ID and name of the program assigned to the current zone.

This parameter selects the program for the current zone. It also determines which program-change value the zone sends via MIDI when you select the setup (the zone won't send a program-change message to the MIDI Out port if it has a value of **Local** for the Dest parameter in the MIDI Xmit menu).

 *Note: When you press the **Program** button, the first parameter you see is the Program ID and Name parameter. To get to the Bank parameter, press < once.*

Entry Transmit

Determines whether the current zone sends a program-change command when you select the setup. If its value is **On**, the zone transmits the program ID of the program assigned to the zone (as shown in the top line of the display when you're viewing this parameter). This is the setting for each zone in the default setup. The program-change message may include a bank-select message, depending on the value of the Bank Mode parameter.

If the value of Entry Transmit **Off**, the zone doesn't send a program change when you select the setup.

The function of this parameter depends on the setting of the Dest parameter. If the current zone's setting for Dest is **Local**, the zone doesn't send a program-change command to the MIDI Out port when you select the setup, even if Entry Transmit is set to **On**.

Bank Mode

Determines what type of bank-select message, if any, the zone sends when you select the setup.

A value of **None** prevents the zone from sending a bank-select message. If the value is **0**, the zone sends a MIDI 0 message, with a value equal to the ID of the current bank. If the value is **32**, the zone sends a MIDI 32 message with a value equal to the ID of the current bank. Values of **0** and **32** enable you to select banks numbered from 0-127.

If the value of Bank Mode is **0/32**, the zone sends both MIDI 0 and MIDI 32, combined as a single value. This enables you to select banks numbered from 0-16,383. Since many of today's MIDI instruments respond to this form of bank-select message (as recommended by the MIDI specification), **0/32** is the value of Bank Mode in each zone of the default setup.

There are two other values for Bank Mode: **K2000** and **K1000**. These enable you to send bank-select and program-change commands to older Kurzweil instruments, which use a different system for numbering programs. The manuals for these instruments explain the numbering system thoroughly.

The function of this parameter depends on the setting of the Dest parameter in the MIDI Xmit menu. If the current zone's setting for Dest is **Local**, the zone doesn't send a bank-select command to the MIDI Out port when you select the setup, regardless of the setting for Bank Mode.

Program ID Display Format (PNumDisp)

This parameter is primarily a convenience for when you're sending MIDI to other instruments or to a sequencer. If you're using the PC2 by itself, there's no need to edit this parameter.

Different MIDI instruments and sequencers refer to program numbers differently: some start counting at 0, and others start at 1. Still others arrange them in groups of 8, with the first digit (or letter) denoting the group, and the second digit denoting the number within the group.

PnumDisp lets you display program numbers in the same format as the receiving MIDI equipment. It doesn't change the outgoing MIDI information in any way; it just makes it easier for you select the desired programs on the receiving gear without having to convert the PC2's program ID into the receiving instrument's format.

0-127	For instruments that start numbering IDs at 0 (the setting for each zone in the default setup)
1-128	For instruments that start numbering IDs at 1
11-88	Compatible with many Roland instruments
A1-P8	For instruments that organize programs in groups of 8

Program Name Display Format (PNameDisp)

This is another parameter designed to help you keep track of programs when you're sending MIDI to other instruments or to a sequencer. It determines the program name you see when you're viewing the Program Name and ID parameter for the current zone (the parameter you see when you press the **Program** button). It doesn't affect the program ID that you see, nor does it affect the MIDI information that the zone sends.

The idea behind this parameter is that you use it only for zones that are sending to MIDI (that is, the zone has a value of either **MIDI** or **Local+MIDI** for the Dest parameter in the MIDI Xmit menu). For any zone that sends to MIDI, PNameDisp lets you choose between viewing what gets selected on the PC2 when you select the setup, or what gets selected on the *receiving* instrument when you select the setup.

If the value is **Internal**, the display normally shows the name of the program that the PC2 uses in that zone. This is the value for each zone in the default setup.

There's one exception when the value of PNameDisp is **Internal**: if the zone has a value of **MIDI** for the Dest parameter (making it a MIDI-only zone), the display shows a name of **External Prog** regardless of the current program ID. This makes sense, since the zone won't select *any* program for the PC2, it'll select a program only for the receiving instrument. The PC2 can't determine the *name* of that program, so it reminds you that it's programmed to select *some* external program with the ID shown in the display.

Use a value of **Gen. MIDI** when the receiving instrument is a General-MIDI instrument. In this case, the PC2 *can* determine the name of the program it's going to select on the receiving instrument, it shows you both the ID and the name.

Use a value of **Off** when you want the PC2 to remind you that the zone will select a program on a non-General-MIDI external instrument when you select the setup. In this case, the display shows **External Prog** regardless of the program ID.

The Key Range Menu

Low and Hi

The primary function for the Key Range menu is determining where a zone plays on the keyboard. This is controlled by the values of the Low and Hi parameters. In the default setup, all zones range from C -1 to G 9. An 88-note keyboard ranges from A 0, to C 8 (and a 76-note keyboard from E 1 to G 7), but you can transpose a zone so that it sends note numbers below or above those ranges—it won't generate notes, but it'll still generate MIDI information, which can be useful).

The PC2 ignores the values of these parameters when the AutoSplit parameter has a value of **On** (the values appear in parentheses to indicate that these parameters are inactive. When AutoSplit is set to On, the value of the AutoSplit Key parameter determines the split points for all the zones in the setup (Zones 3 and 4 cover the region from the bottom of the keyboard up to—and including—the split point, while Zones 1 and 2 cover the region from the top of the keyboard down to the note above the split point).

Intuitive entry makes it easy to edit these parameters; just hold down the **Enter** button and strike a key to set the value.

Note Map

This parameter determines how the PC2 responds to each note on the keyboard. If you're using the PC2 as a solo instrument, you'll probably never need to edit the note map for the internal setup. If you play a lot of setups, or control external instruments, different note maps can be useful in a number of ways.

In the default setup, each zone has a value of **Linear** for Note Map. This gives you a normal keyboard: playing C 4 triggers the note C 4, just as you would expect. Assuming the zone's Dest parameter is at its default value of **Local+MIDI**, every note you play goes both to the PC2 and to the MIDI Out port.

If the value of Note Map is **Off**, the PC2 generates no note information, but still generates all non-note information like MIDI Controller messages.

The next group of values—**1 of 2** through **4 of 4**—generate note information only for specific notes. We call these alternating note maps. They're handy when playing a setup that sends MIDI information to multiple external instruments, because they enable you to play the external instruments as if they were a single instrument, thereby increasing your available polyphony.

A value of **Inverse** reverses the keyboard: high notes at the bottom and low notes at the top. A value of **Constant** causes all the keys to play the same note. By default this is C 4, but you can change it with the Transpose parameter. Setting a zone's Note Map parameter to **Constant** is useful when you want the sound from a particular note to play with every note of another zone—for example, playing a ride cymbal with every note in a bass line.

AutoSplit

Turns the AutoSplit feature on and off for *all zones in the setup*. In the default setup, this value is **Off**. The AutoSplit feature is intended primarily for making quick layers and splits from an Internal-Voices program, but enabling AutoSplit for a setup is useful if you like to solo and mute zones while performing. See *The AutoSplit Feature* on page 3-20 for more information.

AutoSplit Key

When the value of the AutoSplit parameter is **On**, this parameter sets the split point for *all zones in the setup*, overriding each zone's key range settings. Depending on the key ranges you've set for the zones in any particular setup, this may not be useful. On the other hand, you may enjoy the flexibility it provides for muting and soloing. See *The AutoSplit Feature* on page 3-20 for more information.

When the value of AutoSplit is **Off**, the value of AutoSplit Key appears in parentheses, indicating that it's inactive. In this case, the setup uses the values of the Low and Hi parameters to determine the key ranges of each zone.

The Transpose Menu

Transposition

Sets the amount of transposition for the current zone. In the default setup, there's no transposition on any of the zones. Intuitive entry is handy for editing this parameter. There's an example on page 4-5 that describes how it works.

The Velocity Menu

The parameters in this menu control the PC2's response to the attack velocity of the notes you play—in other words, how hard you strike the keys. The settings for the velocity parameters affect both the PC2's sounds, and the MIDI information the PC2 transmits via its MIDI Out port.

A Bit of Background

When you strike a key, the PC2 generates a Note On message with an attack-velocity value corresponding to how hard you strike the key. Attack-velocity values range from 1 to 127; they never go lower than 1 or higher than 127. A value of 1 is the softest and 127 is the loudest.

The velocity parameters interact extensively with each other, so changing one parameter's value can alter the way that others affect the PC2's velocity response. We'll give you a few examples of this interaction. More to the point, it's quite complicated to describe all the possible ways you can use these parameters in combination with each other. As we describe each parameter, the description assumes that all the other parameters are at their default values. Experimenting with different combinations is the best way to understand how these parameters interact.

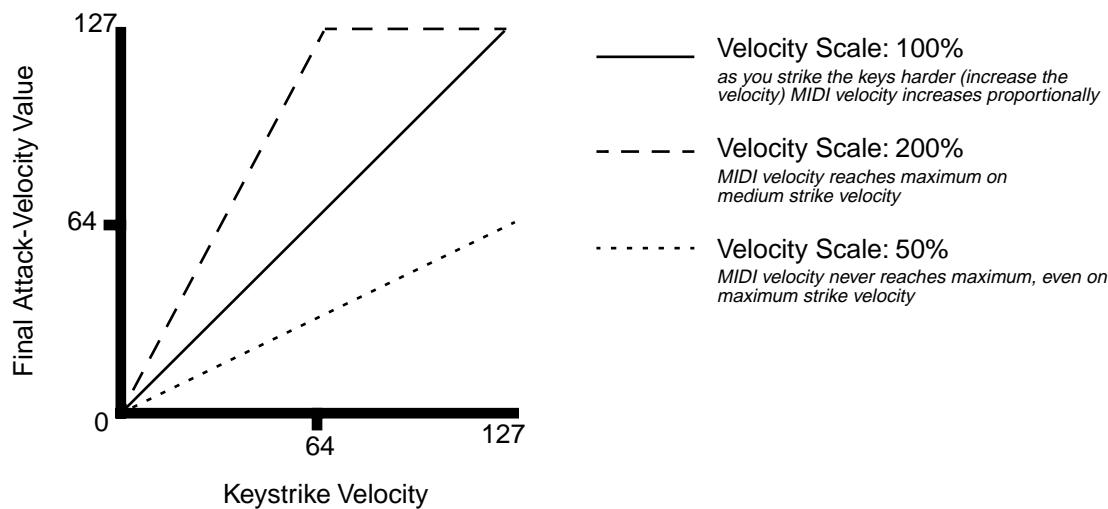
You can use the velocity parameters in several interesting ways: customizing the keyboard for your playing style; compensating for velocity-response differences in instruments receiving MIDI from the PC2; triggering different sounds as you play softer or harder (see *Velocity Switching* on page 4-19 to learn how to trigger different sounds at different velocities).

To illustrate how the velocity parameters work, we've included a number of graphs with the parameter descriptions. In each graph, the horizontal axis (labeled Keystrike Velocity) represents how hard you play. The vertical axis (labeled Final Attack-Velocity Value) is the attack-velocity value that gets sent to the PC2 and to the MIDI Out port *after* any adjustments resulting from non-default values for the velocity parameters. The lines in the graph are the *velocity curve*—which shows the relationship between every possible keystrike velocity value and the resulting final attack-velocity value.

Velocity Scale (Vel Scale)

Increases or decreases the PC2's velocity sensitivity. The value for all zones in the default setup is **100%**—think of this as the normal value. Higher values increase the sensitivity; notes get louder faster than normal as you play harder. Lower values decrease the sensitivity; notes get louder slower than normal as you play harder. You'll notice the difference more when you're playing hard than when you're playing softly.

You can set negative values for Vel Scale, but doing so isn't useful unless you also change the value of the Vel Offset parameter (this is one of those interactions we mentioned). See *Vel Offset* for more information.

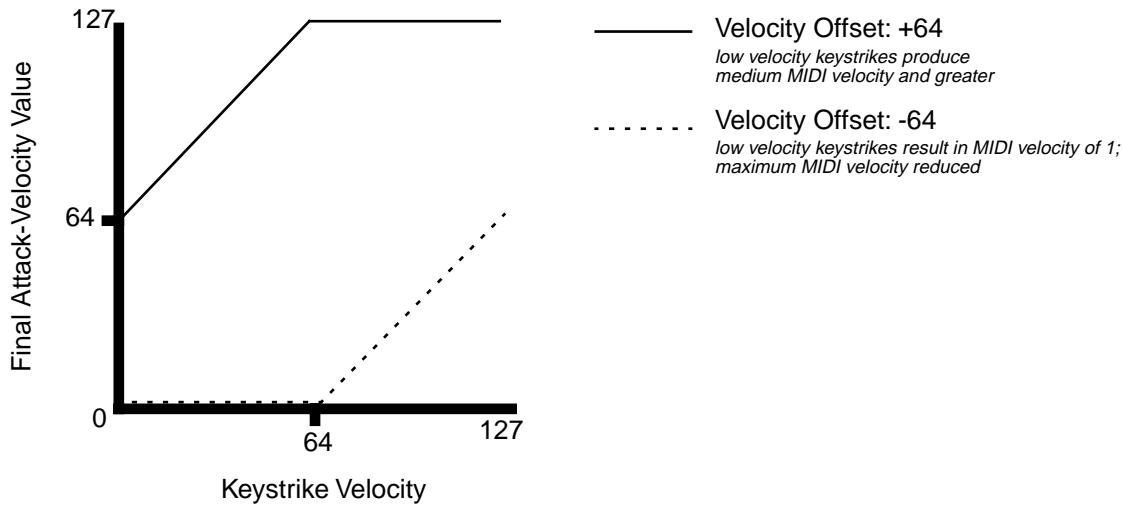


Velocity Offset (Vel Offset)

Adds a constant value to your keystrike velocity. The value for all zones in the default setup is **0**. A positive value for this parameter causes an upward shift in the entire velocity curve. For example, if you set a value of **64**, every note in that zone has a final attack-velocity value of 64 greater than your keystrike velocity (to a maximum of 127, of course). So if you play a note with a keystrike velocity of 32, the final attack-velocity value is 96. Negative values for Vel Offset shift the velocity curve downward.

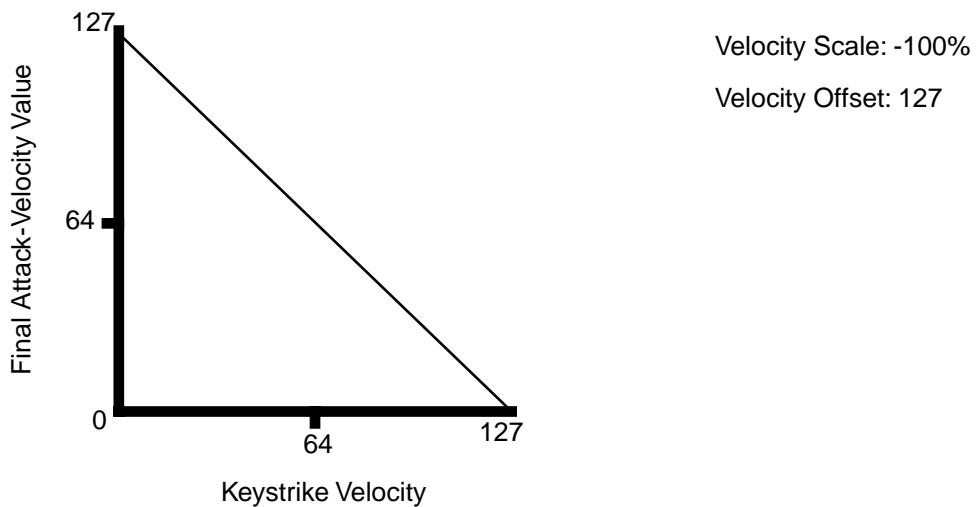
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Vel Scale and Vel Offset have a very close relationship; when you change the value of one of them, you'll often want to change the value of the other as well. For example, suppose you set Vel Scale to 250% in a zone, to make it stand out from the other zones when you're playing hard. You may find that the velocity curve pins at the high end rather quickly—in other words, by the time you're playing *f*, the final attack-velocity value may already be 127, and playing *ff* or *fff* doesn't give you any more dynamics. Setting a negative offset shifts the velocity curve downward, preventing the final attack-velocity value from maxing out before you get to *fff*.

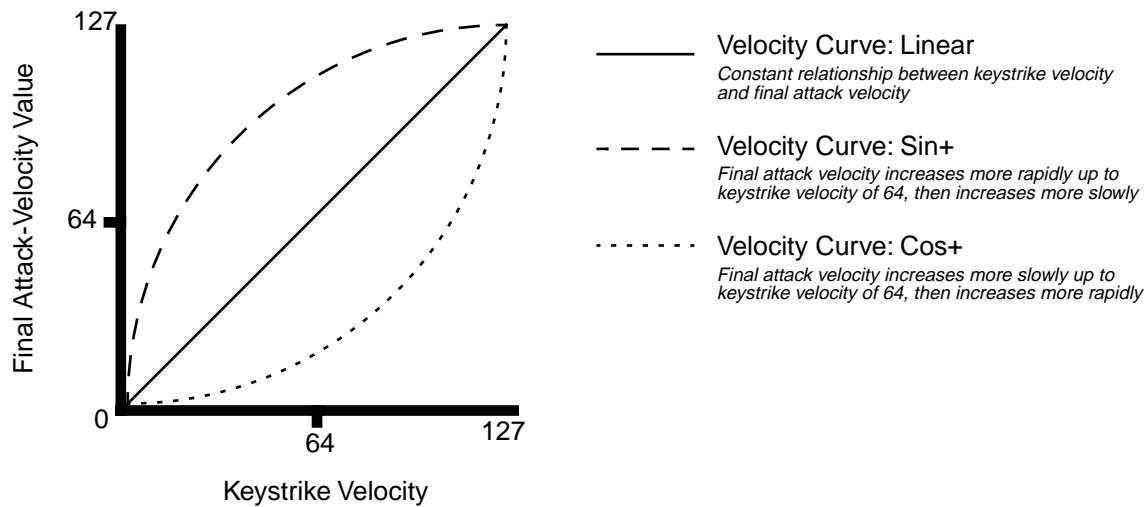
Here's another example: reversing a linear velocity curve so that it plays loud when you strike the keys softly, and vice versa. You might think that all you have to do is set Vel Scale to -100%. When you do that, you find that all the final attack-velocity values are at minimum. When you set Vel Offset to 127, the velocity curve gets shifted as high as it will go, enabling the negative scaling to work properly, as shown in the following graph.



Velocity Curve (Vel Curve)

So far we've been describing the velocity parameters in terms of *linear* velocity curves—that is, the final attack-velocity increases at a uniform rate as your keystrike velocity increases so that on the graph, the velocity curve appears as a straight line. You can use the Vel Curve parameter to change the shape of the velocity curve, which provides variations in dynamic response.

The setting for Vel Curve in all zones of the default setup is **Linear**. There are two other values whose effects are the opposite of each other. **Sin+** causes the final attack-velocity value to increase faster than the linear curve until your keystrike velocity is *mf*, than slower than the linear curve as keystrike velocity continues to increase (the velocity curve resembles the first portion of a sine wave, if you're wondering why the value is called **Sin+**). **Cos+** causes the final attack-velocity value to increase *slower* than the linear curve until your keystrike velocity is *mf*, than *faster* than the linear curve as keystrike velocity continues to increase (resembling the first portion of a cosine wave).



Minimum Velocity (Min) and Maximum Velocity (Max)

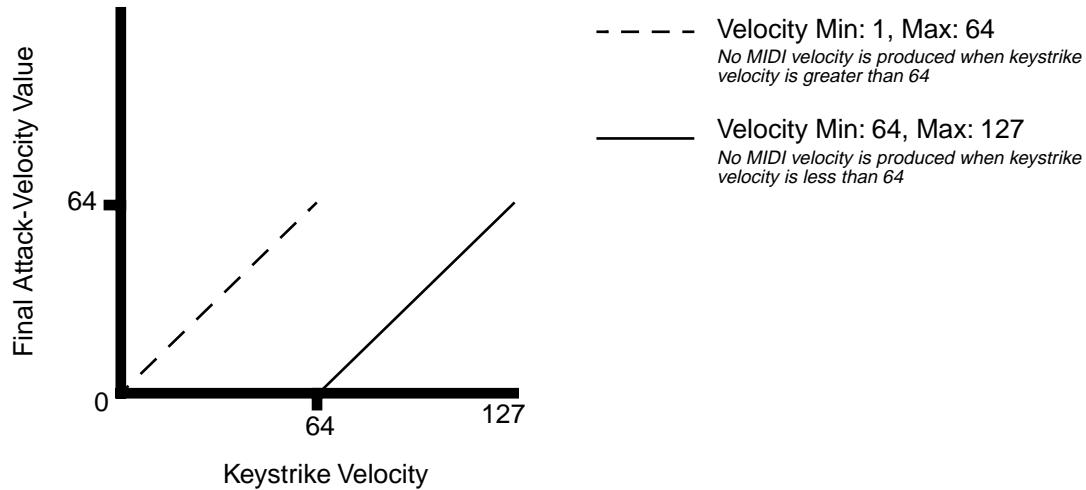
These parameters work in tandem to define the velocity range for the zone. If the final attack-velocity value of a note is below the minimum or above the maximum, the note won't sound. Note that it's not your *keystrike* velocity that determines whether the note sounds, but your *keystrike* velocity plus (or minus) the adjustments applied by the other velocity parameters.

In the default setup, these parameters are set to values of **1** and **127** for all zones. Intuitive entry works nicely for editing: hold down the **Enter** button, and strike any key. Your keystrike velocity sets the value.

You can also set the value of the **Min** parameter higher than the value of the **Max** parameter for any zone. In this case, the zone plays outside the velocity range—that is, you'll hear notes when the final attack-velocity value is below the minimum or above the maximum. final attack-velocity values within the velocity range don't produce notes.

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The Controllers Menu

The Controllers menu contains parameters that define the functions of the PC2's physical controllers (wheels, sliders, breath, pedals, buttons, and ribbon).

Each zone of every setup has a set of independently-programmable controller parameters. Editing a parameter in one zone of a setup affects *only* that zone; it doesn't affect the other zones in the setup, nor does it affect any other setup.

The internal setup (which defines numerous characteristics for every program in Internal Voices mode and KB3 mode) also has a separate set of these same parameters. Editing a parameter in the internal setup affects all programs, but doesn't affect any setups.

There are three groups of controllers listed in the Controllers menu:

- Continuous controllers
- Switch controllers
- Ribbon controller (a specialized continuous controller)

Each of these groups has a set of common but independently-programmable parameters. For example, every continuous controller has a parameter called Ctrl Num; it determines which MIDI message the controller sends. Editing the Ctrl Num parameter for one continuous controller doesn't affect the value of Ctrl Num for any of the other continuous controllers.

To save space, we won't list every parameter for every controller. Instead, we identify the controllers that belong to each group, then list the common parameters once for each group.

Entry Volume

Sets the volume level of the zone when you select the setup, by sending a MIDI Controller 7 message with the value you specify. You can set a value of **None** to prevent the message from being sent when you select a setup.

The Controllers Menu: Continuous Controller Parameters

There are fourteen controllers in the continuous-controller group:

Wheel 1 Up	Pedal 1
Wheel 1 Down	Pedal 2
Wheel 2	Breath
Mono Pressure (MPressure)	Ribbon 1
Slider A	Ribbon 2
Slider B	Ribbon 3
Slider C	
Slider D	

Each of the controllers in this group has the following six parameters.

MIDI Controller Number (Ctrl Num)

Determines which MIDI Controller message the physical controller sends. For example, Wheel 1 (also called the Pitch Wheel) has two assignments: one for when you move it up, and another for when you move it down. In the internal setup, the *physical* controller Wheel 1 Up is assigned to send the *MIDI Controller message* Pitch Up (the value of the Wheel 1 Up parameter is **Pitch Up**). If you change the value of the Wheel 1 Up parameter, you change the MIDI Controller message that the Pitch Wheel sends when you move it up.

Controller Scale (Ctrl Scale)

Amplifies or diminishes the action of the controller. The normal unscaled value is **100%**. Higher values make the controller more sensitive; lower values make it less sensitive. Setting the scale to a negative value makes the controller work in reverse. You can make a controller crossfade its behavior between two zones by assigning the same Ctrl Num value for both zones, then setting Ctrl Scale to a positive value in one zone, and a negative value in the other.

Controller Offset (Ctrl Offset)

Adds or subtracts a constant to the controller, and depending on the value, sets minimum or maximum values. For example, if the value of Ctrl Offset is **25**, the minimum value of the MIDI Controller message sent by the controller is 25. If Ctrl Offset is **-25** (and Ctrl Scale is **100%**) the first one-fifth of the controller's movement (25/127, which is about 1/5) won't do anything, and the maximum value of the MIDI Controller message sent by the controller is 102 (127-25).

Controller Curve (Ctrl Curve)

This parameter affects the behavior of the controller the same way that the Vel Curve parameter affects the PC2's velocity response. If you set Ctrl Curve to **Sin+**, the controller has its greatest effect in the middle of its range; if Ctrl Curve is **Cos+**, the controller has its greatest effect at the ends of its range.

Entry Value

Enables a controller to send a MIDI Controller message of a specific value as soon as you select a program or setup, regardless of the position of the physical controller that is assigned to send

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the message. For example, if you want to make sure that the program in Zone 1 of a setup is panned to the left whenever you select the setup, assign a physical controller in Zone 1 of that setup to send MIDI Controller 10, then set an Entry Value of **0** for that controller.

Entry values ignore the current position of the physical controller when you select the program or setup. In fact, if the physical controller is above or below the entry value when you select the program or setup, moving the controller has no effect until you move it past its entry value. In the panning example above, moving the controller won't change the panning until you move it all the way down, then back up at least partially.

Setting Entry Value to **None** is different from setting it to **0**. **None** means that there's no initial controller command when you select the program or setup, but you'll notice the effect as soon as you move the controller.

Exit Value

Enables a controller to send a MIDI Controller message of a specific value as soon as you leave a program or setup, either by selecting another program or setup, or by changing performance modes. This prevents the position of the controller in the current program or setup from affecting the next program or setup you select.

For example, suppose you have Slider A controlling pan position in Zone 1 of a setup. You have Slider A's Exit Value parameter set to **None** for Zone 1. While you're playing that setup, you pan Zone 1 fully left. If you select another setup that doesn't have an entry value for pan in Zone 1, then Zone 1 of the newly-selected setup will also be panned left. The easiest way to prevent this is to set an exit value of 64 for Slider A in Zone 1. This will return the panning to the center.

In general, if you set an entry value for a controller, it's a good idea to set an exit value as well, to remove that controller's effect when you leave the setup.

The Controllers Menu: Ribbon Controller Parameters

There's one ribbon parameter that's unique to ribbon section 1, as described below:

Ribbon Section Configuration (Ribbon Sect)

Determines the configuration of the optional ribbon controller. A value of **Large** creates a single section spanning the entire length of the ribbon. A value of **3 Sect.** divides the ribbon into three sections (sections) of equal length.

Each ribbon section has the following three parameters:

Spring Switch

Controls the "memory" of each section of the optional ribbon controller *for all zones*. When the value is **On**, the MIDI Controller message sent by the ribbon section "springs" back (the MIDI Controller message's value returns to the value specified by the Spring Pos parameter—the way the Pitch Wheel does on most instruments).

If the value is **Off**, the ribbon section remembers the last value it was sending when you released the pressure on it. If you use a value of **Off**, we recommend that you also set the ribbon section's Exit Value parameter to **0**, so that any lingering values don't apply to other setups that don't have entry values for that ribbon section.

Ribbon Mode

Affects the MIDI Controller values sent by the ribbon section *for all zones*. A value of **Absolute** means that the value of the MIDI Controller message that the ribbon section sends is tied directly to a physical location on the ribbon—in other words, touching a particular point on the ribbon always generates the same value for the MIDI Controller message. If Spring Switch is **On**, this means that when you touch the ribbon, the MIDI Controller value changes from the Spring Pos value to whatever value corresponds to the location of your finger on the ribbon. If Spring Switch is **Off**, touching the ribbon changes the MIDI Controller value from wherever it was when you released the ribbon last time.

A value of **Relative** means that the position of your finger on the ribbon doesn't matter, and when you press it, the MIDI Controller value picks up where you left off (either at the Spring Pos value if Spring Switch is **On**, or whatever the last value was if Spring Switch is **Off**). When Ribbon Mode is **Relative**, touching the ribbon doesn't change this value until you move your finger.

Setting Ribbon Mode to **Relative** works best when you also set Spring Switch to **Off**. In this case, the ribbon works much like the mouse on a personal computer.

Spring Position (Spring Pos)

When Spring Switch is **On**, Spring Pos sets the “return” value for the ribbon section—that is, the MIDI Controller message value sent by the ribbon section when you lift your finger from the ribbon. This affects *all zones* in the setup. A value of **64** sets the zero point in the center of the section; a value of **127** sets the zero point at the cable end of the section; a value of **0** sets the zero point at the other end of the section.

The ribbon controller is a continuous controller, so each ribbon section also has the six continuous-controller parameters (see page 5-15).

The Controllers Menu: Switch Controller Parameters

There are eight controllers in the switch-controller group:

Button SW1	SwitchPdl 1
Button SW2	SwitchPdl 2
Button SW3	SwitchPdl 3
Button SW4	
Button SW5	

Each of these controllers has an independent set of parameters for each setup zone, as described below.

Switch Type (SwType)

Determines how the switch controller works. If the value of SwType is **Momentary**, the controller sends a MIDI Controller message with a programmable value (typically 127 or On) when you press the switch. The controller sends another programmable value (typically 0 or Off) as soon as you release it. In other words, a momentary switch is on only as long as you hold it down. When **SW1–SW5**, are programmed to be momentary switches, their LEDs light while you're holding the buttons, then go out when you release them.

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If the value of **SwType** is **Toggle**, the controller sends a MIDI Controller message with a programmable value (typically 127 or On) when you depress the controller (turning it on); depressing the controller again sends another programmable value (typically 0 or Off). When Buttons **SW1–SW5** are programmed to be toggle switches, the LEDs light when you turn them on, and go out when you turn them off.

On Controller (On Ctrl)

Determines the MIDI Controller message that the controller sends when you turn it on. When you set a value for this parameter, the PC2 automatically assigns the same value to Off Ctrl.

On Value

Sets the value of the MIDI Controller message sent by the controller when you turn it on. The value for all zones in the default setup is 127 or On. You can set any value from 0 to 127, but in most cases, 127 is the most useful. You can also set a value of **None**, in which case the controller sends no message. This is useful when you want the controller to do something in one zone but not in another (although it probably makes more sense to set a value of **None** for On Ctrl).

Off Controller (Off Ctrl)

Determines the MIDI Controller message that the controller sends when you turn it off.

Off Value

Sets the value of the MIDI Controller message sent by the controller when you turn it off. The value for all zones in the default setup is 0 or Off. You can set any value from 0 to 127, but in most cases, 0 is the most useful. You can also set a value of **None**, in which case the controller sends no message. This is useful when you want the controller to do something in one zone but not in another (although it probably makes more sense to set a value of **None** for On Ctrl).

Entry State

Determines what MIDI Controller message, if any, the controller sends when you select the setup. If the value is **None**, the controller sends no message. If the value is **On**, the controller sends a message according to its settings for On Ctrl and On Value. If the value is **Off**, the controller sends a message according to its settings for Off Ctrl and Off Value.

Exit State

Determines what MIDI Controller message, if any, the controller sends when you leave the setup, by selecting either a different setup or a different performance mode. If the value is **None**, the controller sends no message. If the value is **On**, the controller sends a message according to its settings for On Ctrl and On Value. If the value is **Off**, the controller sends a message according to its settings for Off Ctrl and Off Value.

Switch-Button Priority

When you're in MIDI Setups mode—that is, performing and not editing—the switch buttons (**SW1–SW5**) function according to the zone you see in the display. This prevents the conflicts that otherwise would almost certainly occur. For example, suppose you've programmed **SW1** to be a momentary switch in Zone 1 of a setup, and to be a toggle switch in Zone 2. When you're playing that setup, **SW1** can't be both types of switch at the same time, so it makes sense to have it function according to the assignments of the current zone (you might be soloing that zone, for example).

The Arpeggiator Menu

Arpeggiator Activation (Arp Active)

Enables or disables the arpeggiator for the setup. If this parameter's value is Off, then you won't hear arpeggiation for any notes in any zone of the setup, regardless of the settings for any of the other arpeggiator parameters.

In most setups, you can press **SW4** to activate the arpeggiator (in these setups, **SW4** sends MIDI 116, ArpOn. You can program any physical controller (typically a switch controller to activate the arpeggiator by setting its On Ctrl parameter to **116**, and its On Value parameter to any value from **64** to **127**.

Arpeggiator Region, Lower Limit (Low) and Upper Limit (Hi)

Determines, in part, which notes you can arpeggiate. All notes, in all setup zones, that are between the notes specified by Low and Hi (including the notes specified by Low and Hi) get arpeggiated when *both* of the following conditions are met:

- The value of the ArpActive parameter is **On**
- The value of the Zone Enable parameter for that zone is **On**

Zone Enable

Determines whether the current zone can be arpeggiated under any circumstances. If the value is **Off** for a zone, *none* of the notes within that zone's key range get played by the arpeggiator. If the value is **On** (and the arpeggiator is active), notes within that zone's key range get played by the arpeggiator if *either* of the following conditions is met:

- The note is within the arpeggiator region (as defined by the Low and Hi parameters); in this case it becomes one of the latched notes
- The note isn't within the arpeggiator region, but *is* within the range of the arpeggiator's transposition (as defined by the Shift Limit parameter); in this case it doesn't get latched, but still gets played

Take a look at Figure 4-1 on page 4-28. The Zone Enable parameter determines whether arpeggiated notes get sent to a particular zone. Then the zone's parameters process the notes, and if they're within the zone's key range, the notes get played.

Latch Mode

Determines the manner in which notes get latched. There are six possible values:

Keys

The arpeggiator plays only while you are holding one or more keys down (or holding note triggers on). As you play different notes, they get added to the arpeggiator, and as you release notes, they get taken out. If you play notes faster than the arpeggiator's current tempo, each subsequent note gets added to the arpeggiation at the next division of a beat. This can cause a lag between the time you play the note and the time you hear it in the arpeggiation.

Descriptions of Parameters

Setup Editor Parameters

In the next three modes, the arpeggiator latches notes only when MIDI Controller 119 (ArpLatch) sends a value of On (64 or higher). An easy way to experiment with these modes is to assign the Mod Wheel to send MIDI 119.

Overplay

The arpeggiator latches any notes in the arpeggiator that are being held when ArpLatch goes on, and continues playing them, even after you let them go, until ArpLatch off. Any notes that you play after ArpLatch is already on do not get arpeggiated, even if they're in the arpeggiation region.

Arpeg

Similar to **Overplay**: any notes in the arpeggiator region that are held when ArpLatch goes on are latched and arpeggiated, and keep going until ArpLatch goes off. Any notes you play outside the arpeggiation region play normally. Notes that you play inside the arpeggiation region do *not* play unless you hold them on, in which case they become part of the arpeggiation. They drop out of the arpeggiation as soon as you release them.

Add

As with **Overplay** and **Arpeg**, all notes in the arpeggiator region being held when ArpLatch goes on get latched, and keep playing until ArpLatch goes off (even if you've released the notes). Any notes you play in the arpeggiator region after ArpLatch is already on also get latched.

Auto

This value is independent of ArpLatch. Every note you play in the arpeggiator region is automatically latched, and the arpeggiator runs as long as you hold at least one arpeggiated note. As long as you keep holding on at least one note (it doesn't have to be the same note the whole time), every note you play in the arpeggiation region gets latched.

Pedals

A combination of **Keys**, **Add**, and **Overplay**. It relies on both ArpLatch (MIDI 119) and Latch2 (MIDI 118). If neither latch controller is on, notes in the arpeggiator region get arpeggiated only while you are holding down keys (similar to **Keys**).

If you activate Controller 119, notes in the arpeggiator region that are currently held on get latched, and any additional notes in the arpeggiator region played while Controller 119 is on also get latched (similar to **Add**). When Controller 119 is off, any notes in the arpeggiator region that are not currently held on get removed from the arpeggiation.

If you activate Controller 118, notes in the arpeggiator region that are currently held on get latched, and any additional notes in the arpeggiator region played while Controller 118 is on play normally (similar to **Overplay**). This mode is called Pedals mode because you might want to assign Switch Pedal 1 to **Controller 119** (Latch 1) and Switch Pedal 2 to **Controller 118** (Latch 2) to make the pedals function similarly to sustain and sostenuto pedals.

Play Order

Determines the order in which the arpeggiator plays latched notes. There are eight possible values:

Played

Latched notes get played in the chronological order in which you latched them.

Up

Latched notes play in ascending pitch order, regardless of their chronological order.

Down

Latched notes play in descending pitch order, regardless of their chronological order.

Up/Down

Latched notes play from lowest pitch to highest, then from highest pitch to lowest, repeating the cycle until you stop the arpeggiation. The notes at the very top and very bottom play only once.

Up/Dwn Rp

Similar to **Up/Down**, except that the notes at the top and bottom play twice (repeat) when the arpeggiator reverses direction.

Random

Latched notes play in completely random order.

Shuffle

Latched notes play at random, but no note repeats until all other latched notes have played.

Walk

A “random walk” order: each successive note is either the next or previous note (in chronological order of latching). For example, suppose you’ve latched four notes—G 4, B 4, D 5, and F 5—in that order. The first note the arpeggiator plays is the G 4. The second note will be either B 4 (the next note chronologically), or F 5 (the “previous” note chronologically—that is, the last latched note). If the second note is B 4, the third note will be either D 5 or G 4. If the second note is F 5, the third note will be either G 4 or D 5. And so on.

Beats

Sets the number of repetitions for each count of the internal clock. This parameter provides an easy way to change arpeggio tempo in regular intervals. There are seven possible values:

4th notes	One note per clock beat
8th notes	Two notes per beat
8th trips	Three notes per beat
16th notes	Four notes per beat
16th trips	Six notes per beat
32nd notes	Eight notes per beat
32nd trips	Twelve notes per beat

Initial Tempo

The starting tempo of the arpeggiation, and the basis for the divisions created via the value of the Beats parameter. Any physical controller assigned to send MIDI Tempo message can control the arpeggiator tempo in real time.

Descriptions of Parameters

Setup Editor Parameters

The value for this parameter is relevant only if the value for the Clock parameter in the Global menu has a value of **Internal**. If the value of Clock is **External**, the arpeggiator follows the tempo of MIDI Clock signals (if any) received at the PC2's MIDI In port. If no external Clock signal is received, notes in the arpeggiator region do not play at all.

Duration

How long each arpeggiated note lasts. **100%** is legato—no breaks between notes. The lower the value, the more staccato the arpeggiation.

Velocity Mode (Vel Mode)

Determines how the attack velocity of latched notes affects the volume of arpeggiated notes. There are five possible values:

Fixed

All arpeggiated notes play at the same attack-velocity level, determined by the Fixed Vel parameter

Played

Each arpeggiated note plays at the attack-velocity level of its original latched note

Last

All arpeggiated notes play at the attack-velocity level of the most recently-latched note

Pressure

All arpeggiated notes play with attack velocities matching the current value of mono pressure (aftertouch)

Ctrl 117

All arpeggiated notes play with attack velocities matching the current value of MIDI 117, either from a physical controller on the PC2 or received at the MIDI In port

Fixed Velocity (Fixed Vel)

When the value of Vel Mode is **Fixed**, sets the attack-velocity level for all arpeggiated notes.

Note Shift

The value of this parameter determines how much transposition, if any, gets applied to latched notes each time the cycle of latched notes repeats. The transposition is cumulative, and continues until it reaches the amount specified by the value for the Shift Limit parameter.

Shift Limit

Sets the maximum number of semitones that arpeggiated notes can be transposed up or down. This parameter is relevant only when Note Shift has a non-zero value. When the transposition reaches the shift limit, it changes direction according to the value for the Limit Opt parameter.

Limit Option (Limit Opt)

Determines what the arpeggiator does when it has shifted the currently latched notes up (or down) to the shift limit. There are seven possible values:

Stop

Causes the Arpeggiator to stop the arpeggiation when it reaches the shift limit.

Reset

Causes the Arpeggiator to return to its original pitch and repeat the latched cycle of notes, transposing each cycle according to the settings for Note Shift and Shift Limit. If the limit allows the notes to go out of MIDI range (for example, if you set Shift to 12, set the limit to 80, and play C4), then those “ghost” notes don’t sound, but they take up rhythmic space: the arpeggiator waits for the cycle to play itself out before starting over.

Unipolar

After transposing to the shift limit, the arpeggiator begins shifting notes in the opposite direction, until it reaches the original pitch, where it reverses again. To determine the next note when it reaches the shift limit, the arpeggiator calculates the interval between the shift limit and what the next note would be if the shift limit weren’t there. It then plays the note that is the calculated interval lower (if reversing from upward transposition) than the last note before the shift limit. The same thing happens in reverse when the arpeggiated notes get back to the original pitch. The following table makes this easier to visualize by showing the result of arpeggiating one note (C4) in Unipolar mode, with Note Shift set to 3 ST and various values for Shift Limit.

Shift Limit	Resulting Arpeggiation (When LimitOption is Unipolar)			Comment
	Up	Down	Up	
6 ST (F#4)	C4, D#4, F#4,	D#4, C4	D#4, ...	Same notes play in both directions when Shift Limit is a multiple of Note Shift
7 ST (G4)	C4, D#4, F#4,	E4, C#4,	D#4, ...	Last upward note before shift limit is F#4, next upward note would be A4, which is 2 ST from shift limit (G4); therefore first downward note is E4 (2 ST below last upward note)
8 ST (G#4)	C4, D#4, F#4,	F4, D4,	D#4, ...	A4 is 1 ST from shift limit, therefore first downward note is F4 (1 ST lower than last upward note)
9 ST (A4)	C4, D#4, F#4, A4	F#4, D#4, C4,	D#4, ...	All symmetrical again; now A4 is within shift limit
10 ST (A#4)	C4, D#4, F#4, A4,	G4, E4, C#4,	D#4, ...	Next upward note would be C5, which is 2 ST from shift limit
11 ST (B4)	C4, D#4, F#4, A4,	G#4, F4, D4,	D#4, ...	C5 is 1 ST from shift limit
12 ST (C5)	C4, D#4, F#4, A4, C5,	A4, F#4, D#4, C4,	D#4, ...	Symmetrical again, including C5

Bipolar

Starts out the same way as **Unipolar**, but during downward note shifting, it continues past the original pitch until it hits the shift limit in the *opposite* direction, where it reverses again.

Descriptions of Parameters

Effects Editor Parameters

Flt Reset

Adds a bit of apparent randomness to the process. **Flt** stands for “Float,” and it means that when the arpeggiator reaches the shift limit, it resets—but not to its original pitch as with plain **Reset**. Like **Unipolar** and **Bipolar**, it looks at the first note that would exceed the shift limit, and calculates the interval between that note and the shift limit. It then restarts the cycle of latched notes, transposing the entire cycle by the interval it just calculated, then shifting each subsequent cycle by the value of Note Shift, until it reaches the shift limit again.

Here’s a very simple example. Suppose that the only note in the arpeggiator cycle is C 4, Note Shift is 4 (a third), and Shift Limit is 7 (so notes won’t get shifted above G 4). The arpeggiator plays C 4, then E 4. The next note should be G[#] 4, but that’s above the shift limit—so the PC2 calculates the difference between that G[#] 4 and the shift limit (G 4): one semitone. It adds that difference to the original starting note (C 4) and plays that note next—C[#] 4. The next note (F 4) is within the shift limit, but the next note (A 4) isn’t, so it gets translated into D 4—and so on.

Flt Uni

Uses the same concept as **Flt Reset** and applies it to Unipolar mode: when the arpeggiator reaches the shift limit, it calculates the difference between the next note and the limit, and transposes the next cycle of notes down by that interval, then shifts each subsequent cycle down until it reaches the original pitch.

Flt Bipl

Similar to **Flt Uni**, but the downward shift limit isn’t the original pitch, it’s the negative of the Shift Limit value.

Glissando

When the Glissando parameter is **On**, the arpeggiator chromatically fills between latched notes. When Glissando is on, the Arpeggiator ignores the Note Shift, Shift Limit, and Limit Option parameters.

You must latch at least two notes to get a result. When Glissando is on, all notes played in the arpeggiation range get latched, although you won’t necessarily get meaningful results from all latched notes. In general, try to get each subsequent note you latch to be a change in direction. For example, try latching the following sequence of notes: C4, C5, G4, G5, C5, C6, G4, G5. The “glissando” changes direction around each change in direction of the latched notes.

Effects Editor Parameters

FXA Select

Selects the menu of parameters for the FX-A block. The effect ID and name appear, enabling you to select an effect for FX-A, or to view / edit the four FX-A parameters by pressing **>** one or more times).

FXB Select

Selects the menu of parameters for the FX-B block. The effect ID and name appear, enabling you to select an effect for FX-B, or to view / edit the four FX-B parameters by pressing **>** one or more times.

FXA/B Select

This parameter appears only when the current effect is one of the double-block KB3 effects. It selects the menu of parameters for the FX-AB block. The effect ID and name appear, enabling you to select an effect for FX-AB, or to view / edit the four FX-AB parameters by pressing > one or more times.

Effect ID and Name

The display doesn't show you the names of these parameters, as it does with most other parameters. Instead, you'll see **FXA Select** in the top line (or **FXB** or **FXAB**, depending on the current effect block). This parameter appears when you press the **Select** button for either FX-A or FX-B, enabling you to select an effect for the current effect block, or to view / edit the current effect block's four parameters by pressing > one or more times.

Parameters for Current Effect—Variable

Select these parameters by pressing > one or more times after pressing the **Select** button for either FX-A or FX-B. The parameters you see are determined by the current effect.

Effects Change Mode (FX Chg Mode)

Determines how the PC2 selects effects when you select a program or setup. Select this parameter by pressing the **FX Mode** button while in any performance mode, or while in the MIDI Recv menu. There are two possible values:

Auto

The PC2 selects the effect associated with whatever programs you select while in Internal Voices mode or KB3 mode; it selects the effect associated with whatever setup you select while in MIDI Setups mode.

Panel

The PC2 ignores the effects associated with whatever program or setup you select. Select effects from the front panel by pressing the **Select** button for either FX-A or FX-B, then use any data entry method to change the current effect. This effect gets applied to every program or setup you select, regardless of performance mode.

Effects Channel (FX Channel)

Affects how the PC2 handles effects when you change programs. This parameter is closely related to the FX Chg Mode parameter.

FX Chg Mode is Auto; FX Channel is Current

These are the default settings for both parameters, and provides the most useful model for managing effects. In this case, program changes on the channel used by the program in the display (or program changes on the channel used by Zone 1 of the setup in the display) also change the current effect. This is true for internal program changes as well as those received via MIDI. Programs on all other channels use the current effect, but retain their own settings for wet/dry mix.

FX Chg Mode is Auto; FX Channel is 1–16

Program changes on the channel designated as the FX channel (or program changes in the setup zone that uses the FX channel) change the current effect. This is true for internal program

Descriptions of Parameters

Effects Editor Parameters

changes as well as those received via MIDI. All other programs use the current effect, but retain their own settings for wet/dry mix.

FX Chg Mod is Panel

In this case, the value of FX Channel is irrelevant. Program changes—either from the PC2 or via an external MIDI source—never change the current effect (you must change the current effect from the PX2's front panel). The channel used by the program in the display adopts the wet/dry mix of the current effect as soon you change the effect via the front panel. The other channels don't adopt the wet/dry mix of the current effect until you make a program change.

MIDI Receive Mode

When you're in MIDI Recv mode (that is, when you're in the MIDI Recv menu), program changes received via an external MIDI source change the current effect (or not) according to the same rules described above. The only difference is that when the PC2 receives a program change via MIDI, the wet/dry mix settings for each channel are determined by the wet/dry parameters in the MIDI Recv menu.

Stored Effects (Stored FX)

The value of this parameter is relevant only for those factory programs and setups to which you've stored effects settings. For these programs and setups, you can quickly revert to using the factory effect settings without erasing your user-defined settings (which is what happens when you use one of the Restore Factory Effects functions in any Save dialog). This parameter has two possible values:

Factory

When you select a program or setup, the PC2 applies the original factory settings to the corresponding effect, even if you have stored your own effect settings with the program or setup.

User

When you select a program or setup, the PC2 applies your user-defined settings (if any) to the corresponding effect.

If you change the value of this parameter, you'll need to reselect the current program to notice the change in effect. This parameter works only when the value of FX Chg Mode is **Auto**. When FX Chg Mode is **Panel**, the PC2 uses the factory settings for whatever effect you select from the front panel.

KB3 Editor Parameters

The Timbre Menu

Wheel Volume Map (WheelVolMap)

The wheel volume map determines the volume level for each tone wheel. We've provided several tone wheel volume maps here, based on measurements we've taken of different organs.

- Equal** All tone wheels at the same volume. Not based on a real B-3.
- Bright** Normal map, based on a B-3 in good condition.
- Mellow** Somewhere between **Bright** and **Junky**.
- Junky** Based on a B-3 with an uneven, rolled-off response.

OrganMap

Controls the relative amplitude of each key, per drawbar. Like the wheel volume maps, these maps are based on measurements we've made on actual organs.

- Equal** Uses the same volume for each key and drawbar, and is not based on a real B-3.
- Peck's** Normal map, from a B-3 in good condition.
- Bob's** More uneven, based on an old B-3.
- Eric's** More idealized; smoothed out, but less realistic.

Chorus/Vibrato (Chor/Vib)

Determines the preset chorus or vibrato effect that gets applied to the program. The six possible values are **Chor1–Chor3**, and **Vib1–Vib3**. For choruses, the amount of detuning increases from **Chor1** to **Chor3**. For vibratos, the vibrato depth increases from **Vib1** to **Vib3**.

DrawbarMode

Determines whether the program's drawbar controls set themselves to the positions of the drawbar controls when you select the program.

Preset

Initial drawbar settings are defined by the values of Drawbar parameters 1–9; they ignore the initial positions of the drawbar controls. Moving the drawbars affects the sound during performance, but the program restores the preset values each time you select the program.

Live

Initial drawbar settings are defined by the positions of the drawbar controls (Sliders A–D and Mod Wheel)

Descriptions of Parameters

KB3 Editor Parameters

Drawbars 1–9 (Drawbar)

The nine parameters correspond to the nine drawbar controls (Sliders A–D and Mod Wheel). Each can have a value from **0** (drawbar fully in) to **8** (drawbar fully out)

DrawbarSteps

Affects the transition between drawbar levels for each of the drawbar controls.

Smooth

Levels range from 0–127 (but still represented as 0–8 in the display). Smoother transition between levels than **Normal**.

Normal

Levels range from 0–8, like actual organ drawbars.

Preamp Response (PreampResp)

Enables/disables the preamp+expression pedal part of the KB3 model.

On

Makes KB3 programs function like stock organs. The expression pedal in this case is more than a volume pedal; it actually functions like a “loudness control,” varying the frequency response to compensate for the ear’s sensitivity at different volumes. In addition, the preamp provides a deemphasis curve to compensate for the built-in tone wheel volume preemphasis.

Off

Emulates organs that have been modified to have a direct out (before the preamp and expression pedal).

Leakage

Controls the level of the simulated crosstalk and signal “bleed” of adjacent tone wheels in the model. This is provided to help “dirty up” the sound to make it a bit more realistic. A setting of **-96 dB** gives the purest tones; other values add more simulated leakage. This level is scaled by the drawbar levels, as well as the expression pedal level.

Amp

Standard amplitude (volume) control.

The Envelope Menu

Keyclick

Enables/disables Keyclick. Values are **On** or **Off**.

Keyclick Volume (KeyclickVol)

Adjusts the volume of the keyclick when the value of the Keyclick parameter is **On**.

NoteAttack

Controls the attack characteristic of KB3 notes.

Normal

Smoothed attack.

Hard

Instant attack with audible click, in addition to any amount of key click specified with the Keyclick and KeyclickVol parameters (you might want to set Keyclick to **Off** when you use this setting).

PercHard

Hard attack level for percussion only; notes without percussion use a normal attack.

NoteRelease

Controls the release characteristic of notes.

Normal Smoothed release.

Hard Instant release with audible click.

The Envelope Menu: Percussion Parameters

There are four possible combinations of percussion effects. The following table lists these combinations, and indicates which set of parameters corresponds to each combination.

Combination of Effects	Corresponding Parameter Group
Loud and Fast	Ld/Fast
Loud and Slow	Ld/Slow
Soft and Fast	Sft/Fast
Soft and Slow	Sft/Slow

For each combination, there are three parameters:

Level

Sets the absolute level of the percussion effect.

Decay

Sets the decay rate of the percussion effect—that is, how long it takes to fade to silence.

Volume Adjust (Vol Adj)

Adjusts the amplitude of the organ relative to the amplitude of the percussion effect.

Envelope Menu: Percussion Pitch Parameters

Three parameters control the pitch of the percussion effect:

Low Harmonic (Low Harm)

Controls which drawbar is used as the basis for the low harmonic of the percussion effect. The actual pitch obtained depends on which drawbar you use. On an actual tone wheel organ, this is Drawbar 4. You can use any of the nine drawbars. Whichever drawbar you use, it will affect the pitch of the low harmonic only when percussion is on (the Zone 1 button is lit), and the low harmonic is active (the Zone 4 button is off).

High Harmonic (High Harm)

Controls which drawbar is used as the basis for the high harmonic of the percussion effect. The actual pitch obtained depends on which drawbar you use. On an actual tone wheel organ, this is Drawbar 5. You can use any of the nine drawbars. Whichever drawbar you use, it will affect the pitch of the high harmonic only when percussion is on (the Zone 1 button is lit), and the high harmonic is active (the Zone 4 button is lit).

Steal Bar

Controls which drawbar is disabled (if any) when the percussion effect is turned on (the Zone 1 button is lit). On an unmodified tone wheel organ, the ninth drawbar is the one disabled. Possible values are **Drawbar1–Drawbar9**, and **None**.

The LFO Menu

The LFO parameters for KB3 programs are the same as those for Internal-Voices programs. See *The LFO Menu* on page 5-3.

System Parameters

There are two menus in the system parameters region of the front panel: Global and MIDI Recv. The Global menu controls several features that affect the entire PC2, while the MIDI Recv menu enables you to configure each MIDI channel for use when the PC2 is receiving MIDI information from an external source (typically a sequencer).

The Global Menu

Local Control

Controls the connection between the PC2's sound engine and its MIDI-generating components (keyboard and physical controllers). Set Local Control to **On** (the default) when you want to be able to play the PC2 from its own keyboard (as well as to control MIDI slaves). Set Local Control to **Off** when the PC2 is receiving MIDI from an external source. This is particularly important when you're using a sequencer, since you'll most likely have MIDI cables going into the sequencer from the PC2, and into the PC2 from the sequencer. This can cause notes to get doubled if the Soft Thru or Play Thru feature of the sequencer is active.

Clock

Set Clock to **Internal** (the default) to use the PC2's internal MIDI clock for arpeggiation, and to control synchronization with external MIDI equipment. Set Clock to **External** when you want the PC2 (including the arpeggiator) to synchronize with a MIDI Clock signal from an external source.

Transmit Clock

This parameter determines whether the PC2 sends its internal MIDI clock signal to its MIDI Out port. This parameter is irrelevant if the Clock parameter has a value of **External**. There are three possible values:

Off	The PC2 doesn't transmit its internal clock signal.
On	The PC2 always transmits its internal clock signal to its MIDI Out port.
Seq	Default value. The PC2 transmits its internal clock signal to its MIDI Out port only when you're playing one of the demo sequences or using the arpeggiator.

Touch

Sets the keyboard sensitivity for the entire PC2, somewhat like the Vel Scale parameter for individual programs and setups (like Vel Scale, the value for the Touch parameter also affects notes that get sent via MIDI). There are seven possible values:

1 Linear	5 Hard1
2 Light1	6 Hard2
3 Light2	7 Hard3
4 Light3	

A value of **Linear** (the default) is the standard, unaltered level of keyboard sensitivity. Values of **Light1**–**Light3** are for players who have a light touch—that is, you can play more lightly and still get the same attack-velocity values. **Light1** is more sensitive than **Linear**, and **Light3** is the most sensitive.

Values of **Hard1**–**Hard3** are for players who have a heavier touch—that is, you can play harder and still get the same attack-velocity values. **Hard1** is less sensitive than **Linear**, and **Hard3** is the least sensitive.

Change Setups (Chg Setups)

Determines what the PC2 does when you select a setup.

Immediate

The newly-selected setup becomes active as soon as you select it. Any notes being held by the PC2 (or by Kurzweil instruments receiving MIDI from the PC2) continue with their normal decays. Non-Kurzweil MIDI slaves may cut off notes as soon as the PC2's setup changes.

Keys Up

Default value. The newly-selected setup becomes active only after you've physically released all keys (notes held with Sustain or other MIDI Controllers don't delay the change). Until you

release the last key, the Setup Select button corresponding to the ID of the new setup blinks. Any notes being held by the PC2 (or by Kurzweil instruments receiving MIDI from the PC2) continue with their normal decays. Non-Kurzweil MIDI slaves may cut off notes as soon as the PC2's setup changes.

Setup Change Channel (Setup Chg Chan)

Enables the PC2 to change *setups* when it receives a *program-change message* from an external MIDI source. This is useful when the PC2 is controlled by another instrument or a sequencer. The possible values are **None** (the default, which disables this feature), and **1–16**.

Set the value of this parameter to match the channel on which you want to send program-change messages from the external source. Make sure that none of your external MIDI sources uses that channel for any other purpose; if the PC2 receives a program-change message on that channel from *any* MIDI source, it will change setups, which may not be what you want.

When you've set this parameter's value to a specific MIDI channel, bank-select messages with values of 0–3 received on that channel select setup banks 1–4.

MIDI In

Determines how the PC2 handles MIDI information received at its MIDI In port. There are three possible values:

Normal

The default. The PC2 leaves the MIDI information unaltered. If the Thru/Out switch on the rear panel is set to Thru, the PC2 passes the MIDI information to the MIDI Thru port.

Remap

Processes incoming MIDI information as if it had been generated by the PC2 itself: notes get rechanneled into four different zones according to their note numbers, and sent to the MIDI Out port on the appropriate channels. Any notes that lie in overlapping zones get sent on *all* the corresponding channels. Channel numbers on incoming notes are ignored. Non-note information (controllers, pitchbend, etc.) get sent on *all* active channels: for example, if the four zones of a Setup are transmitting on channels 2, 5, 9, and 12, any Pitch Bend information coming into the PC2 (on any channel) get sent on channels 2, 5, 9, and 12 simultaneously.

Merge

Mixes incoming MIDI data with the data generated by the PC2 and sends the combined data stream to the MIDI Out port. Channel numbers of incoming commands remain intact. Both note and non-note messages get passed normally, but System Exclusive messages get filtered out. A value of **Merge** doesn't affect the behavior of the MIDI Thru port, if you're using the MIDI Thru/Out port.

Wrap/Skip

This is a convenience feature. When Wrap/Skip has a value of **On** (the default), you won't see any unused program or setup IDs when you scroll through programs and setups. When Wrap/Skip has a value of **Off**, you'll see all unused program and setup IDs, in which case the display shows **Not Found** for those programs and setups.

Exit Save

Affects what happens when you exit an editor without saving. If the value is **Never** (the default), the PC2 won't prompt you to save your edits when you leave an editor (by pressing one of the mode-selection buttons). In this case, the mode-selection button flashes, prompting you to select a bank (or press the same button again to enter that mode on the last program or setup you were using in that mode).

If the value is **Ask**, leaving an editor without saving causes the PC2 to ask you if you want to save your edits. You can press **Yes** or **No** as desired, or you can press a mode-selection button to cancel your edits and return to a performance mode.

Drum Remap

Determines the layout of the timbres in drum programs. There are three possible values:

Normal	Default value. No remapping of drum timbres.
PC2ReMap	Assigns many timbres to different note numbers.
GMReMap	Remaps drum timbres according to the General MIDI layout.

KB3 MIDI Chan

Specifies which channel can play KB3 programs (because they have special processing requirements, KB3 programs are available on only one channel at a time). If you try to assign a KB3 program to a channel that's not the KB3 channel, the program change won't take effect.

Tuning

You can tune the PC2 up or down one semitone, in one-cent increments. This can be useful if you are playing along with a recording, or playing with other acoustic instruments that can't be easily retuned. The default value is **0 cents**.

Receive Transposition (Recv Trans)

This allows you to transpose the instrument globally, for all MIDI channels. (Using the Transpose function in the zone parameters affects only individual zones in a setup, or if changed in Internal Voices mode, affects any program you play on the keyboard, but not any information coming in the MIDI In port.) The default value is **0 ST**.

Bank-Select Controller (Bank Sel Ctl)

Determines how the PC2 responds to bank-select messages received at the MIDI In port. There are four possible values:

0	Uses <i>only</i> MIDI Controller 0 as a bank-select command.
32	Uses <i>only</i> MIDI Controller 32 as a bank-select command.
0/32	Default value. Uses MIDI Controller 0 and 32 as a single combined bank-select command, enabling selection of banks numbered from 0 to 16,383.
0or32	Responds to either MIDI Controller 0 <i>or</i> 32 as separate bank-select commands.

AllNotesOff

If you set this to **Ignore**, the PC2 will ignore the MIDI All Notes Off message. Some instruments and sequencers (notably older Roland instruments) will send this message when no notes are being held, even if the sustain pedal is still held. If you are hooked to a Roland sequencer and find that the PC2 doesn't seem to sustain, set this parameter to **Ignore** and the problem will go away.

The default value is **Respond**, which causes the PC2 to respond to All Notes Off messages.

Device ID

Sets the ID used by the PC2 for MIDI SysEx messages—which the PC2 uses for dumping objects. The default value is **0**.

If you always dump objects—programs, setups, or effects—to the same device and reload them from that device, you won't have to worry about this parameter; just leave its value at **0** and your dumps will work just fine. If you plan to dump objects to different objects in a MIDI chain, however—or if you want to reload different dumps to different instruments in a MIDI chain—you'll need to change the device ID for at least one instrument. See *More About SysEx Dumps* on page 4-9.

Xmit Buttons

You can generate MIDI SysEx messages when you press the buttons on the pC2's front panel. You can also send these messages to the MIDI Out port, enabling you to record them to a sequencer along with note and controller information. This enables you to include operations like muting and soloing, activating the arpeggiator, muting and activating effects—even changing performance modes—as part of the sequence. When you play back the sequence, the PC2 responds just as if you had pressed the buttons yourself.

To transmit button presses via SysEx, set the value of this parameter to **On** (the default is **Off**).

Output Mode

Configures the PC2 for monaural (mono) or stereo audio output. The default is **Stereo**. You might want to use mono mode if you have a mono sound system, or have only one channel available on your mixer.

Digital Output Mode (DigOut Mode)

If you're using high-end digital processing and recording gear, you may want to leave this parameter at its default setting of **Pro** (AES/EBU format). Most other equipment (such as the typical DAT recorder) is compatible with the **Cons.** (consumer) setting (S/PDIF format). Use whichever mode works best for you.

Digital Output Channel Status (DigOut ChanStat)

The PC2's digital audio output includes a pair of status bits for each sample. These status bits inform receiving equipment of various aspects of the audio signal, like sample rate and audio data width. Most digital processing and recording equipment requires these bits to be transmitted, so by default, the PC2 sends these status bits (a value of **On** for this parameter). If your equipment isn't processing or recording the PC2's digital audio output properly, try setting the value of this parameter to **Off**, which prevents the PC2 from sending the status bits.

Digital Output Width (DigOut Width)

Determines the size, in bits, of the digital “words” that the PC2 sends to the digital outs. Choose between 16-bit, 18-bit, 20-bit, or 24-bit digital word lengths. Set this to match the input digital-word-length configuration of your recording or processing equipment.

Digital Output Level (DigOut Level)

You can control the output level with the Master Volume Slider (a value of **Slider**), disable it with a value of **Off**, or fix it at any level from **-79 dB** to **+24 dB**.

Digital Output Shaping (DigOut Shaping)

By default, this parameter’s value is **On**, which “shapes” the digital audio output, providing a smoother noise floor. If you’re sending the PC2’s digital output to another digital device for further processing, you may want to set the value of this parameter to **Off**, especially if the other device applies its own shaping.

Available RAM (Mem Avail)

Not editable. Displays the amount of memory (RAM) available for storing user-defined objects. Approximately 231 kilobytes for units with no user-defined objects.

PC2 Model

Not editable. Identifies the instrument model: **76** indicates PC2; **88** indicates PC2X.

Keyboard Version (Ver)

Not editable. Identifies the installed version of the keyboard.

Expansion Block 1 (EXP1)

Not editable. Indicates whether Expansion Sound Card 1 is properly installed (indicates a problem if you’ve installed the card and the value is **No**).

Expansion Block 2 (EXP2)

Not editable. Indicates whether Expansion Sound Card 2 is properly installed (indicates a problem if you’ve installed the card and the value is **No**).

Reset PC2?

Not a parameter but a prompt to execute a hard reset. Press **Yes**, and you’ll see a prompt asking you if you’re sure. The prompt prevents you from executing a hard reset inadvertently. A hard reset erases all RAM, and restores all programs, setups, effects, and global parameters to their original factory settings.

Dump all objects?

Not a parameter but a prompt to initiate a SysEx dump of all programs, setups, and effects.

MIDIScope?

Not a parameter but a prompt to run MIDIScope, a MIDI-analysis application. Monitors any event from the PC2's keyboard or controllers, as well as MIDI information (including SysEx messages received at the MIDI In port. Press any non-controller button to exit.

The MIDI Recv Menu

The MIDI Recv menu is designed to make it easy to configure your PC2 as a MIDI slave, with a set of parameters for defining how it responds to incoming MIDI information. Each channel has an independently-programmable set of the parameters described below. The settings for these parameters affect the PC2's performance modes, as well as how the PC2 transmits MIDI information.

You can easily select MIDI channels by holding the **MIDI Recv** button and pressing Sound/Setup select buttons **1–16** to select channels 1–16.

Channel Activation (No parameter name shown)

Activates/deactivates current channel.

Program ID and Name (No parameter name shown)

Specifies a program for the current channel. Transmits the program change both to the PC2 and to the MIDI Out port.

Volume (Vol)

Sets the volume level for the current channel.

Pan

Specifies the pan setting for the current channel. A value of 0 is full left; 64 is center; 127 is full right.

A-to-B Wet/Dry Mix (Global A>B)

For the current program on the current channel, specifies how much of the processed signal coming from FX-A goes to FX-B and gets FX-B's effect applied to it. Also transmits values to the MIDI Out port.

FX-A Wet/Dry Mix (A)

For the current program on the current channel, specifies how much of FX-A's effect gets applied to the dry signal coming from the PC2's sound engine. Also transmits values to the MIDI Out port.

FX-B Wet/Dry Mix (B)

For the current program on the current channel, specifies how much of FX-B's effect gets applied to the dry signal coming from the sound engine. Also transmits values to the MIDI Out port.

Appendix A

Maintenance and Upgrades

Replacing the Battery

Changes that you make to your PC2 settings are stored using a Lithium battery when the PC2 is powered off. When it is time to replace your battery, the PC2 will display the message: "Battery voltage is low" for a few seconds after being powered up. If this happens, you should replace the battery as soon as possible.

Before you Begin

You'll need the following items:

- one CR2032 battery which is a 3 volt Lithium coin cell that can be purchased from Radio Shack and large drug stores.
- a #2 Phillips screwdriver
- a large table with a padded surface to prevent damage: foam or soft cloth
- a pen cap or plastic knife

Replacing the battery may erase the programs and setups that you have created, so back them up using a MIDI SysEx dump as described on page 4-4. When you are finished, turn off the power and remove all cables from your PC2 including the power adapter.

Opening your PC2

1. Place your PC2 with the keyboard and front panel down on the padding with the rear panel jacks facing you.
2. You will see a flat panel about 15 inches long and 4 inches wide in the bottom of the PC2. Use the screwdriver to remove the 7 screws that fasten the option panel.
3. Remove the panel by sliding the panel a couple of inches away from you and lifting it out of the opening.

Installing the Battery

1. If the PC2 has any Sound ROM options installed, remove each of them by pushing the metal tabs on each end of the SIMM socket outwards at the same time, tilting the option board to a vertical position, and removing. Note the positions of the option boards, so you can replace them properly.
2. Insert your fingernail, a plastic knife, or a pen cap in one of the slots on the top of the battery's retaining clip and gently pry the battery loose from the retaining clip, as shown in Figure 5-1.

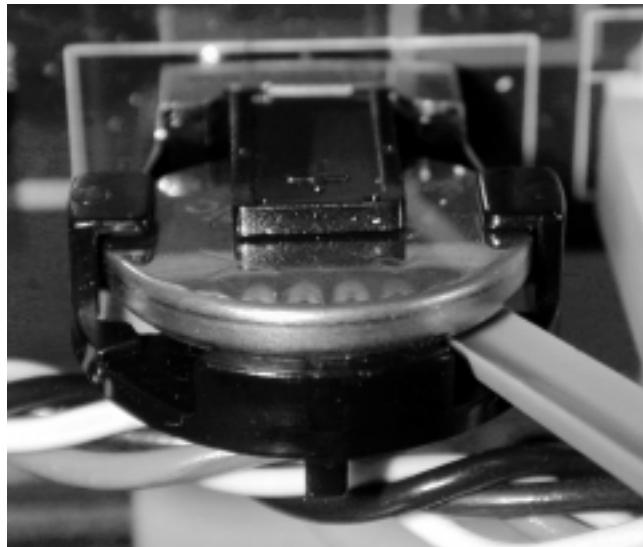


Figure 5-1 Freeing battery from retaining clip

3. Insert your fingernail, the plastic knife, or the pen cap behind and under the battery, and lift the battery out, as shown in Figure 5-2.

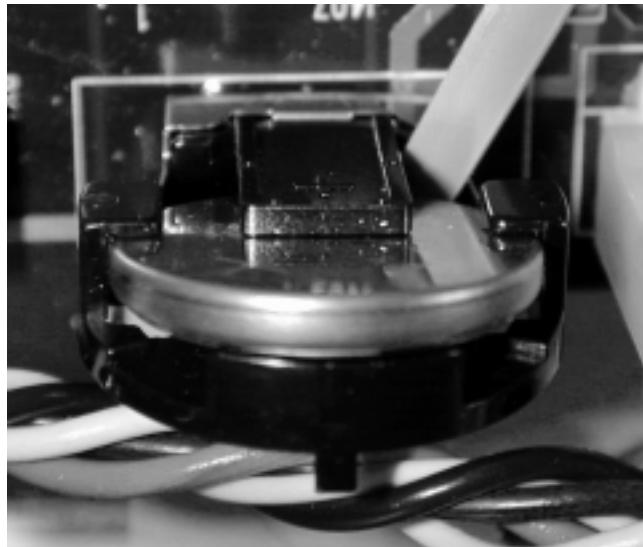


Figure 5-2 Removing battery

4. With the positive (+) side of the new battery facing away from you, slide the battery into the retaining clip, pushing down on the battery until it snaps into place.
5. Replace the Sound ROM options (if you have them) by inserting vertically and then tilting them towards the back of the unit until they snap into place.

Replacing the Option Panel

1. Replace the option panel sliding it in such that the unpainted edge is underneath the rear part of the opening.
2. Line up the holes in the panel with the holes in the bottom and install and tighten the screws.

Powering up

When you have finished, turn the PC2 over, plug in the power adapter, and turn the power on. You should see the usual start up messages. If the "Battery voltage is low" message still appears, review the battery replacement steps to see if you missed something.

Boot Block

Although the PC2 comes from the factory with an operating system (OS, also called engine software) and factory setups already installed, you may decide to upgrade the software and/or hardware at a later time to add more features or sounds. The PC2 boot block lets you install new software and factory setups into Flash ROM. The boot block also provides hard reset and diagnostic options.

Execution of any function in the boot block may cause or require a hard reset causing erasure of the setups that you have created. To save them, back them up using a MIDI Sysex dump as described on page 4-4.

Starting the Boot Block

When you power up the PC2, it displays "Waiting for scanner," then displays "Please wait" after a couple of seconds. When you see "Please wait," press and release the **Panic** button.

After the boot block message banner and version number are displayed, the first of several menu items appears on the screen. Pressing the buttons underneath the display scrolls through the menu items. Pressing the **Enter** button (**Yes** is printed underneath) invokes the menu item in the screen.

About Software Upgrades

You can get software upgrades for your PC2 from Kurzweil's FTP website (www.youngchang.com/kurzweil/html/downloads.html) or from your Kurzweil dealer. A computer (Mac or PC) with a MIDI interface and sequencer is necessary for transferring the software to your PC2 using MIDI Sysex. A list of compatible software sequencers will accompany your software upgrade kit. If you don't have a computer, your PC2 can be upgraded by a Kurzweil Service Center.

The software upgrades are encoded as one or more standard MIDI files. Filenames are in the format **PC2XVVV.MID**, where **X** is the block being updated (**b** for boot block, **e** for operation system, and **s** for setups), and **VVV** is the version number (**V.VV**). Don't attempt to install files with names that don't conform to this format; it won't work.

Setting Up For a Software Upgrade

1. Connect a MIDI cable from the MIDI Out of the computer's MIDI port or interface to the MIDI In of the PC2.
2. Launch the sequencer application.
3. Open the first .MID file using the sequencer program.
4. Start the boot block on the PC2 using the directions above.

Installing an Operating System or Setups

This procedure is for installing OS and setup files. See *Installing a New Boot Block* on page A-4 if you want to install a new boot block.

1. Select **Install engine** by pressing the **Enter** button.
2. Select **via MIDI** by pressing the **Enter** button.
3. Start playing the MIDI file from the sequencer. While loading, the bottom line of the PC2's display will show a message "segment X of Y" where X starts at 1 and increments with each segment up to Y segments. If the display continues to show "waiting for MIDI" after starting the sequencer, stop and restart the sequence.
4. Depending on the size of the file, it may take up to 17 minutes to completely load at which point the bottom line of the display will show **done**. Then, if you have another file to load, open that file from the sequencer and start playing it.
5. After you have completed loading all of the MIDI files (except a boot block file), press the **Cancel** button twice to get back to the main boot block menu, scroll to the **Hard RESET** menu item, and select it by pressing **Enter**. Before doing a hard reset, please read *Resetting the PC2* on page A-5, so you can avoid losing any of your PC2 programs or setups.
6. Press **Yes** to execute a hard reset; the PC2 will restart with the new operating system and/or setups.

Installing a New Boot Block

If the file you are loading is a boot block file with the letter **b** as the fourth letter in the filename, follow instructions in *Setting Up For a Software Upgrade* on page A-4, then continue:

1. Scroll to **Update boot block** and select by pressing **Enter**.
2. Select **via MIDI** by pressing **Enter**.
3. Start playing the MIDI file from the sequencer. While loading, the bottom line of the PC2's display will show a message "segment 1 of 1." If the display continues to show "waiting for MIDI" after starting the sequencer, stop and restart the sequence.
4. After about a minute, the PC2 will reset and start running normally.

Installing Sound ROM Options

After installing a Sound ROM option SIMM using the accompanying instructions, you will need to transfer the presets from the option ROM to the PC2's Flash ROM. Once the SIMM(s) has been installed and the option panel replaced, complete the following instructions:

1. Start the boot block on the PC2 using the directions above.
2. Scroll to **Install ROM option** and select by pressing **Enter**.
3. Select the correct option (**card 1** or **card 2**) by scrolling and pressing **Enter**.
If a ROM option is installed in the correct card slot, the display will show "Installing..." followed by a sequence of address blocks. When the installation is complete, the main boot block menu will be displayed.
4. If you're installing a second ROM option, select **Install ROM option** again by pressing **Enter** repeat Step 3.
5. Scroll to the **Hard RESET** menu item, and select by pressing **Enter**. Before doing a hard reset, please read *Resetting the PC2* on page A-5, so you can avoid losing any of your PC2 programs or setups.
6. Press **Yes** to execute a hard reset; the PC2 will restart with the additional ROM option setups installed.

Resetting the PC2

If you select **Hard RESET** by scrolling and pressing **Enter**, the display will ask **Erase RAM objects?** which gives you an important opportunity to think about what you are doing. This resets all of the PC2's memory back to the initial factory state. This is necessary if you are upgrading the software or installing ROM options. If you're not concerned about losing all of your work, or it has been saved using a MIDI Sysex dump (see page 4-4), then press the button beneath the **Yes** on the display. The PC2 will execute a hard reset and start running normally.

Running the Diagnostics

The **Run diags** option executes the diagnostics that are loaded with the operating system. Some diagnostic tests will erase the PC2's memory, which will cause a hard reset when the PC2 is powered on again. Power off and power on your PC2 to leave diagnostics and return to normal operation.

Appendix B

Reference

Specifications

Specifications are subject to change without notice.

Physical Specifications

Dimension	PC2		PC2X	
Height	4 $\frac{5}{16}$ in	10.95 cm	4 $\frac{5}{16}$ in	10.95 cm
Depth	14 in	35.60 cm	14 in	35.60 cm
Length	47 $\frac{13}{16}$ in	121.45 cm	54 $\frac{5}{16}$ in	137.95 cm
Weight	35 lb	16 kg	50 lb	23 kg

Electrical Specifications

Voltage and Frequency Ranges

	120 VAC Adapter Model PM0023A	230 VAC (Adapter Model PM0024A)
Safe voltage range	100–125 Volts RMS	200–230 Volts RMS
Safe frequency range	58–65 Hz	48–65 Hz

Power Consumption

Voltage Level	Power consumption
120 VAC	0.6 Amps
230 VAC	0.3 Amps

Environmental Specifications

	Minimum		Maximum	
Operating temperature	40 F	5 C	104 F	40 C
Storage temperature	-13 F	-25 C	185 F	85 C
Operating humidity	5%		95% (non-condensing)	
Storage humidity	5%		95% (non-condensing)	

Audio Specifications

Line-Level Left and Right Analog Audio Outputs

Connectors	Balanced outputs using two 1/4-inch stereo (tip-ring-sleeve) phone plugs and shielded twisted-pair cable or unbalanced using two 1/4-inch mono (tip-ring) phone plugs and coaxial cable
Impedance	400 Ω, balanced, nominal
	200 Ω, unbalanced, nominal
Maximum output level	21 dBu (8.7 Volts RMS) balanced, high-impedance load
	15 dBu (4.4 Volts RMS) unbalanced, high-impedance load
Frequency response	20Hz–20kHz +/- 0.6 dB
Idle channel noise	Less than -115 dBA, balanced, relative to full-scale signal
Dynamic range	Greater than 112 dBA, balanced, using -60 dBFS signal
Stereo channel separation	96 dB

Digital Audio Output

Connectors	IEC 60958-3 (S/PDIF) electrical interface using one RCA connector
Output impedance	75 Ω, nominal
Formats	S/PDIF (Consumer) and AES/EBU (Professional)
Digital audio format	48 kHz linear PCM
Bit width	16, 18, 20, and 24 bits (software selectable)
Dither	Flat and shaped (software selectable)

Headphone Output

Output impedance	47 Ω, nominal
Maximum output level	-4 dBu (0.5 Volts RMS) with 32 Ω load

Parameter Reference

Parameter Group	Subgroup (if any)	Parameter	Range of Values	Default
MIDI Xmit (transmit)		MIDI Channel	Off, 1–16	Zones 1–4 default to channels 1–4
		Dest	Local, MIDI, Local+MIDI	Local+MIDI
		Bnd Rng (semitones)	0–127	2
		Bnd Rng (cents)	0–127	0
		AuxBend1 Up	0–60 semitones	12
		AuxBend1 Down	0–60 semitones	12
		AuxBend2 Rng	0–60 semitones	12
Program		Bank	0–13,683	Internal Voices
		Program	0–127	
		Entry Transmit	Off, On	On
		Bank Mode	None, Ctl 0, Ctl 32, Ctl 0/32, K2000, K1000	Ctl 0/32
		PNumDisp	0–127, 1–128, 11–88, A1–P8	0–127
		PNameDisp	Off, Internal, Gen MIDI	Internal
Key Range		Lo	C-1–G 9	D 0
		Hi	C-1–G 9	G 9
		Note Map	Off, Linear, 1 of 2, 2 of 2, 1 of 3, 2 of 3, 3 of 3, 1 of 4, 2 of 4, 3 of 4, 4 of 4, Invrs, Const	Linear
		AutoSplit	Off, On	On
		AutoSplit Key	C-1–G9	G# 3
Transposition		Transpose	-127 to 127	0
Velocity		Vel Scale	-300 to 300%	100%
		Vel Offset	-127 to 127	0
		Vel Curve	Linear, Sin+, Cos+	Linear
		Vel Min	1–127	1
		Max	1–127	127
Continuous controllers These controllers all have the same six parameters, called the Basic Parameter Group. Default values are usually the same, with the exception of Ctrl Num; its value varies for each controller	Wheel 1 Up		Any control source or destination (Next column for defaults) -300 to 300% (default 100%) -127 to 127 (default 0 for all) Linear, Sin+, Cos+ (default Linear) None, 0–127 (default None) None, 0–127 (default None)	Wheel 1 Up Ctrl Num: Pitch Up
	Wheel 1 Down			Wheel 1 Down Ctrl Num: Pitch Down
	Wheel 2			Wheel 2 Ctrl Num: Mod Whl
	MPressure			MPressure Ctrl Num: Pressure
	Slider A			
	Slider B			
	Slider C			
	Slider D			
	Pedal 1			
	Pedal 2			
	Breath			

Reference

Parameter Reference

Parameter Group	Subgroup (if any)	Parameter	Range of Values	Default
Continuous controllers: Ribbons Ribbons have three common parameters, called the Spring Parameter Subgroup The ribbon controllers also have the six basic parameters.	Spring Parameters	Ribbon Sect	Large, 3 Sect.	Large
		Spring Switch	Off, On	On
		Ribbon Mode	Absolute, Relative	Relative
		Spring Pos	0–127	64
	Ribbon 1 basic parameters	As indicated in Basic Parameter Group		
	Ribbon 2 spring parameters	As indicated in Spring Parameter Subgroup		
	Ribbon 2 basic parameters	As indicated in Basic Parameter Group		
	Ribbon 3 spring parameters	As indicated in Spring Parameter Subgroup		
	Ribbon 3 Basic parameters	As indicated in Basic Parameter Group		
	Button SW1	SwType On Ctrl On Value Off Ctrl Off Value Entry State Exit State	Momentary, Toggle (default Momentary) Any control source or destination (default None) None; 0–127 (default None) Any control source or destination (default None) None; 0–127 (default None) None, Off, On (default None) None, Off, On (default None)	
Arpeggiator	Button SW2			
	Button SW3			
	Button SW4			
	Button SW5			
	SwitchPdl 1			
	SwitchPdl 2			
	SwitchPdl 3			
	Arp Active	Key range	Off, On	Off
	Low		C-1 to G9	G 9
	Hi		C-1 to G9	C-1
	Zone Enable		Off, On	On
	Latch Mode	Keys, OverPlay, Arpeg, Add, Auto, Pedals		
	Play Order	Played, Up, Down, Up & Down, Up & Down Rpt, Random, Shuffle, Walk		
	Beats	4th Notes, 8th Notes, 8th Trips, 16th Notes, 16th Trips, 32nd Notes, 32nd Trips		
	Initial Tempo	20–300 BPM		
	Duration	1–100%		
	Vel Mode	Fixed, Played, Last, Pressure, Ctrl 117		
	Fixed Vel	1–127		
	Note Shift	-12 to 12		
	Shift Limit	0–88		
	Limit Opt	Stop, Reset, UniPolar, BiPolar, Flt Reset, Flt Unipolar, Flt Bipolar		
	Glissando	Off, On		

Parameter Group	Subgroup (if any)	Parameter	Range of Values	Default
Internal Voices: Timbre (for each layer)		KeyMap L	Any keymap	
		Keymap R	Any keymap	
	Key Range	Lo	C -1 to G 9	C 0
		Hi	C -1 to G 9	C 8
		Block param 1	Varies according to Block	
		Block Param 2	Varies according to Block	
		Amp	-96dB to 48dB	20 dB
		Mod Wheel	None, 0-127	0
		Breath	None, 0-127	0
		Data	None, 0-127	0
		MIDI 9	None, 0-127	0
		MIDI 12	None, 0-127	0
		MIDI 13	None, 0-127	0
		MIDI 29	None, 0-127	0
Internal Voices: Envelope		Attack	0.018x-50.000x	1.000x
		Decay	0.018x-50.000x	1.000x
		Release	0.018x-50.000x	1.000x
Internal Voices: LFO		LFO1 Rate	0.00Hz-24.00Hz	2.00Hz
		LFO1 Shape	None, 1/4 /Sine, 1/2 /Sine, 3/4 Sine, Sine, 1/4 +Sine, 1/2 +Sine, 3/4 +Sine, +Sine, 1/4 Squ, 1/2 Squ, 3/4 Squ, Square, 1/4 +Squ, 1/2 +Squ, 3/4 +Squ, +Square, 1/4 Tri, 1/2 Tri, 3/4 Tri, Triangle, 1/4 +Tri, 1/2 +Tri, 3/4 +Tri, +Triangle, Rise Saw, +Rise Saw, Fall Saw, +Fall Saw, 3 Step, +3 Step, 4 Step, +4 Step, 5 Step, +5 Step, 6 Step, +6 Step, 7 Step, +7 Step, 8 Step, +8 Step, 10 Step, +10 Step, 12 Step, +12 Step	None
		GLFO Rate	0.00Hz-24.000Hz	2.00Hz
		GLFO Shape	Same as LFO	None

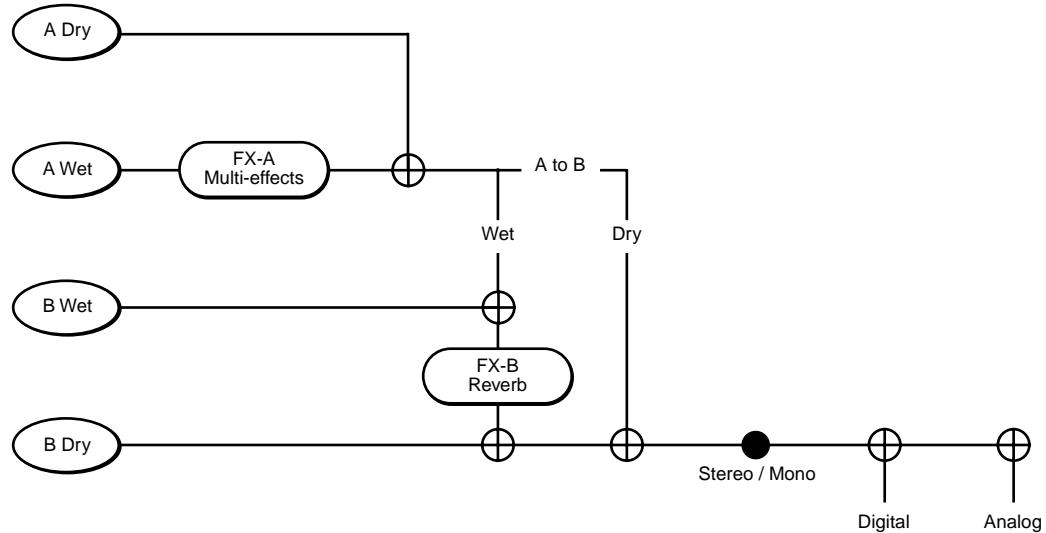
Reference

Parameter Reference

Parameter Group	Subgroup (if any)	Parameter	Range of Values	Default
Global		Local Control	Off, On	On
		Clock	Internal, External	Internal
		Transmit Clock	Off, On, Seq	Seq
		Touch	1 Linear, 2 Light1, 3 Light2, 4 Light3, 5 Hard1, 6 Hard2, 7 Hard3	1 Linear
		Chg Setups	Keys Up, Immed	Keys Up
		Setup Chg Chan	None, 1–16	None
		MIDI In	Normal, Remap, Merge	Normal
		Wrap/Skip	Off, On	On
		Exit Save	Never, Ask	Never
		Drum Remap	Normal, PC2ReMap, GMReMap	Normal
		KB3 MIDI Chan	1–16	1
		Tuning	-100 ct to 100 ct	0 ct
		Recv Trans	-64 to 63	0
		Bank Sel Ctl	0, 32, 0/32, 0 or 32	0/32
		All Notes Off	Respond, Ignore	Respond
		Device ID	0–127	0
		Xmit Buttons	Off, On	Off
		Output Mode	Stereo, Mono	Stereo
		DigOut Mode	Pro, Cons	Pro
		DigOut ChanStat	Off, On	On
		DigOut Width	16 bit, 18 bit, 20 bit, 24 bit	16 bit
		DigOut Level	Slider, Off, -79dB to +24 dB	Slider
		DigOut Shaping	Off, On	On
		Mem Avail	Not editable	220K
		Keyboard	Not editable	76 Ver: 1
	Expansion Blocks	EXP1	Not editable	No
		EXP2	Not editable	No
		Reset PC2?	N/A	N/A
		Dump all objects?	N/A	N/A
		MIDIScope?	N/A	N/A
MIDI Recv (for each channel)		(Channel status)	Off, On	On
		Bank:Program	0:000–16,384:127	0:000
		Volume	0–127	127
		Pan	0–127	64
	Wet/Dry Mix	Global A>B	0%–100%	Varies
		A:	0%–100%	Varies
		B:	0%–100%	Varies
Effects (for A and B outputs)		(Status)	On / Off	Varies
		Select	1–380 (nonconsecutive)	N/A
		Parameter 1	Determined by the FXMod assignment the current effect	Varies
		Parameter 2	Determined by the FXMod assignment the current effect	Varies
		Parameter 3	Determined by the FXMod assignment the current effect	Varies
		Parameter 4	Determined by the FXMod assignment the current effect	Varies
Wet/Dry		Global A>B	0%–100%	Varies
		A:	0%–100%	Varies
		B:	0%–100%	Varies
FX Mode		FX Chg Mode	Panel, Auto	Auto
		FX Channel	Current, 1–16	Current
		Stored FX	Factory, User	User

Parameter Group	Subgroup (if any)	Parameter	Range of Values	Default
KB3: Timbre		WheelVolMap	Equal, Bright, Mellow, Junky	
		OrganMap	Equal, Peck's, Bob's, Eric's	
		Chor/Vib	Vib1, Vib2, Vib3, Chor1, Chor2, Chor3	
		DrawbarMode	Preset, Live	
		Drawbars 1–9	0–8	
		DrawbarSteps	Smooth, Normal	
		PreampResp	On, Off	
		Leakage	-96 dB–0.0 dB	
		Amp	-96 dB to +48 dB	
KB3: Envelope		Keyclick	Off, On	
		KeyclickVol	-96 dB–0.0 dB	
		NoteAttack	Normal, Hard, PercHard	
		NoteRelease	Normal, Hard	
	Perc Ld/Fast	Level	0.0 dB–24.0 dB	
	Perc Ld/Slow	Decay	0.01 s—5.10s	
	Perc Sft/Fast	Vol Adj	-12.0 dB–12.0 dB	
	Perc Sft/Slow	Low Harm	Drawbar1–Drawbar9	
	Perc Pitch	High Harm	Drawbar1–Drawbar9	
		Steal Bar	None, Drawbar1–Drawbar9	
KB3: LFO	Rotor Effects	Low Rate	-10.00 Hz–10.00 Hz	
		Low Adjust	-10.00 Hz–10.00 Hz	
		High Rate	-10.00 Hz–10.00 Hz	
		High Adjust	-10.00 Hz–10.00 Hz	

PC2 Audio Signal Routing



MIDI Controllers

	None						
0	Bank MSB	32	Bank LSB	64	Sustain	96	DataInc
1	Mod Wheel	33		65	Port Switch	97	DataDec
2	Breath	34		66	Sosten	98	NRg LBS
3		35		67	Soft	99	NRg MSB
4	Foot Control	36		68	Legato	100	Rg LSB
5	Port Time	37		69	Hold2	101	Rg MSB
6	Data MSB	38	Data LSB	70	SndCtl1	102	
7	Volume	39		71	SndCtl2	103	
8	Balance	40		72	SndCtl3	104	
9		41		73	SndCtl4	105	
10	Pan	42		74	SndCtl5	106	
11	Expression	43		75	SndCtl6	107	
12	EfxCtl 1	44		76	SndCtl7	108	
13	EfxCtl 2	45		77	SndCtl8	109	
14		46		78	SndCtl9	110	
15	AuxBnd2	47		79	SndCtl10	111	
16	Gen 1	48		80	Gen 5	112	
17	Gen 2	49		81	Gen 6	113	
18	Gen 3	50		82	Gen 7	114	
19	Gen 4	51		83	Gen 8	115	
20		52		84	PortCtl	116	ArpOn
21	AuxBnd1 MSB	53		85		117	ArpVel
22		54		86		118	Latch2
23		55		87		119	Latch1
24		56		88		120	SndOff
25		57		89		121	RstCtl
26		58		90		122	LclCtl
27		59		91	FXBWWet	123	NtsOff
28		60		92	FXABWWet	124	OmniOf
29		61		93	FXAWWet	125	OmniOn
30		62		94	FXRoute	126	MonoOn
31		63		95	Ef5 Dpt	127	PolyOn

Special Controllers

The controllers in the following table are not MIDI Controllers. The numerals indicate the buttonpad entries that select the corresponding controllers.

128	Pitch Bend	133	Tempo	138	Goto Prog	143	Seq Stop
129	Rev Bnd	134	Key Number	139	Setup Inc	144	Seq Cont
130	Pitch Up	135	Key Veloc	140	Setup Dec	145	Trans Up
131	Pitch Down	136	Prog Inc	141	Goto Setup	146	Trans Down
132	Pressure	137	Prog Dec	142	Seq Start		

KB3 Controllers

There's a subset of the MIDI Controller numbers dedicated to controlling KB3 features. The first column in the following table lists the Controller numbers that KB3 programs always respond to. KB3 programs also respond to the Controller numbers in the second column; these are the Controller numbers that the Voce™ MIDI Drawbar Controller uses to control common tone-wheel organ features. Whatever kind of external MIDI source you're using, you can use the MIDI controller numbers in either the second or third column to control the corresponding KB3 feature in the first column. For example, to control Drawbar 1, you can send either MIDI 6 or MIDI 12.

KB3 Program Feature	MIDI Controller Number	
	K2600	Voce
Drawbar1	6	12
Drawbar2	22	13
Drawbar3	23	14
Drawbar4	24	15
Drawbar5	25	16
Drawbar6	26	17
Drawbar7	27	18
Drawbar8	28	19
Drawbar9	1	20
Expression Pedal	4	8
Percussion On/Off	73	N.A.
Percussion High/Low	72	72
Percussion Loud/Soft	71	71
Percussion Fast/Slow	70	70
Rotating Speaker Slow/Fast	68	68
Vibrato/Chorus On/Off	95	95
Vibrato/Chorus Selector	93	93
Key Click Level	89	89
Leakage Level	90	90

PC2 Keymaps

1	Piano f Left
2	Piano f Right
3	Piano mf Left
4	Piano mf Right
5	Piano mp Left
6	Piano mp Right
7	Piano 3Vel L
8	Piano 3Vel R
9	Piano 3V Easy L
10	Piano 3V Easy R
11	Piano f Mono
12	Piano mf Mono
13	Piano mp Mono
14	Piano 3Vel Mono
15	Piano 3V Easy M
16	Piano 440 f L
17	Piano 440 f R
18	Piano 440 mf L
19	Piano 440 mf R
20	Piano 440 mp L
21	Piano 440 mp R
22	Piano 440 3Vel L
23	Piano 440 3Vel R
24	Piano 440 3VEZ L
25	Piano 440 3VEZ R
25	Piano 440 f Mono
26	Piano 440 mf M
27	Piano 440 mp M
28	Piano 440 3Vel M
30	Piano 440 3VEZ M
31	Piano 3Vel L alt
32	Piano 3Vel R alt
33	Piano 3Vel rag L
34	Piano 3Vel rag R
35	Piano f rag L
336	Piano f rag R
37	Piano alttimb1 L
38	Piano alttimb1 R
39	Piano alttimb2 M
40	Piano alttimb3 M
50	Rhoadz Hard
51	Rhoadz Soft
52	Rhoadz 2Vel
53	Rhoadz Thump
57	Wurly Hard
58	Wurly Med
59	Wurly Soft
60	Wurly 3Vel
61	Wurly Thump
62	Wurly Key Releas
63	FM Elec Piano
64	Clav

65	Clav alt
66	Clav alt2
67	Clav Key Release
68	Harpsichord
69	Harpsichord Rel
70	Accordion
71	Celesta
80	B3 Bars 1-3
81	B3 Full
82	B3 Key Click
83	B3 Dist Wave
84	B3 Full Wave
85	B3 Bars 1-3 Wave
86	B3 Bars 1-4 Wave
87	B3 SW Wave
88	Tone Wheel Wave
90	Trumpets
91	Trombets
92	Trombets alt
93	Trombones
94	Trombones alt
95	Low Bones
96	Tenor Sax
97	Tenor Sax alt
98	Tenor Sax Fast
99	Tenor Sax med
100	Bari/Tenor Sax
101	Baritone Sax
110	Stereo Strings
111	Strings Left
112	Strings Right
113	Meteor Strings
120	Take6 Aah Attack
121	Take6 Aah Loop
122	Take6 Aah Loop a
123	Take6 Ooh Attack
124	Take6 Ooh Loop
125	Take6 Ooh Loop a
126	Take6 Ooh Loopa2
127	Take6 Ooh Glide
129	Take6 Bop
130	Take6 B(op)
131	Take6 Dot
132	Take6 Dot alt
133	Take6 D(ot)
134	Take6 Doop
135	Take6 Doop alt
136	Take6 D(oop)
137	Take6 Accents 2V
138	Take6 Accents 3V
160	Sine Wave
151	Partials 1 2

152	Partials 1 3
153	Partials 1 4
154	Partials 1 6
155	Partials 1 8
156	Partials 1 12
157	Partials 1 2 3
168	Partials 1 2 4
159	Partials 1 2 4 6
160	Partials 1 3 5
161	Partials 2 3 4
162	Partials 2-4 Gli
163	Partials 2-10Evn
164	Partials 2-12Evn
165	Partials 3 4
166	Partials 3 4 5
167	Partials 4 5 6 7
168	Partials 5 6 7
169	Partials 5-11Odd
170	Partials 11-15
171	Partials 13-20
172	Partials 16-21
173	Partials prime
174	Sawtooth Wave
175	Saw Wave Dull
176	Saw Wave Duller
177	Saw Wave Dullest
178	Triangle Wave
179	Square Wave
180	Square Wave Dull
181	Pulse Wave 1/3
182	Buzz Wave
183	Bell Wave
184	Clav Wave
185	Sine Wave altun
186	Synth Vox
187	Koreana
188	Hybrid Pan
200	Steel String Gtr
201	StlStrGtrHiDecay
202	Clean Elec Gtr
203	Distorted Guitar
210	EBass1 Finger
212	EBass1 Fng alt
213	EBass1 Fng alt2
214	EBass2 Finger
215	EBass Slap
216	Synth Fretless
217	Upright Bass
230	Dry Kit 1
231	Dry Kit 2
232	Dry Kit 3
233	Ambient Kit 1

234	Ambient Kit 2
235	Electric Kit 1
236	Electric Kit 2
237	Light Kit
238	Hybrid Kit 1/L
239	Hybrid Kit 2/R
240	Hybrid Kit 3/L
241	Hybrid Kit 4/R
242	Kicks and Snares
243	Jazz Toms/Kicks
244	Sine Toms/Kicks
245	Ride Cymbal
246	Drum Lyr1 C4-B4
247	Drum Lyr2 C4-B4
248	SFX Layers C4-B4
249	Reverse Drums
260	Percussion 1
261	Percussion 2
262	Percussion 3
263	Percussion 4
264	Percussion 5
265	Perc Layers 1
266	Perc Layers 2
267	Perc Layers 3
268	Perc Layers 4
269	Perc Layers 5
270	Perc Layers 6
271	Perc Layers 7
272	Conga Moose Lyr
273	VeryMutedTriang1
274	Marimba
275	Vibes
276	Vibes/Bells
277	Agogo/Bells
267	Agogo Bells Keys
279	Triangle Keys
280	Layer Vibes
909	Diagnostic Sine*
999	Silence

Keymap 909 is used in the program 127 Sine, which is intended *only* for diagnostic purposes. It's not useful as a program keymap.

Reference

PC2 Effects and Effects Parameters

PC2 Effects and Effects Parameters

Reverb

ID	Effect	Param1	Param2	Param3	Param4
1	NiceLittleBooth	Rverb Time	HF Damping	Size Scale	Density
2	Viewing Booth	Rverb Time	HF Damping	Size Scale	Density
3	Drum Booth	Rverb Time	HF Damping	Size Scale	Density
4	Add Ambience	Rverb Time	HF Damping	Size Scale	Density
5	BrightSmallRoom	Rverb Time	HF Damping	Size Scale	Density
6	Tight Perc Room	Rverb Time	HF Damping	Size Scale	Density
7	SmallDarkRoom	Rverb Time	HF Damping	Size Scale	Density
8	Bassy Room	Rverb Time	HF Damping	Size Scale	Density
9	Percussive Room	Rverb Time	HF Damping	Size Scale	Density
10	Bathroom	Rverb Time	HF Damping	Size Scale	Density
11	Real Room	Rverb Time	HF Damping	Size Scale	Density
12	Drum Room	Rverb Time	HF Damping	Size Scale	Density
13	Drum Room B	Rverb Time	HF Damping	Size Scale	Density
14	Large Room	Rverb Time	HF Damping	Size Scale	Density
15	Small Chamber	Rverb Time	HF Damping	Size Scale	Density
16	SmallDrumChamber	Rverb Time	HF Damping	Size Scale	Density
17	Brass Chamber	Rverb Time	HF Damping	Size Scale	Density
18	Sax Chamber	Rverb Time	HF Damping	Size Scale	Density
19	Plebe Chamber	Rverb Time	HF Damping	Size Scale	Density
20	Live Chamber	Rverb Time	HF Damping	Size Scale	Density
21	Grandiose Hall	Rverb Time	HF Damping	Size Scale	Density
22	Elegant Hall	Rverb Time	HF Damping	Size Scale	Density
23	Bright Hall	Rverb Time	HF Damping	Size Scale	Density
24	Ballroom	Rverb Time	HF Damping	Size Scale	Density
25	Medium Hall	Rverb Time	HF Damping	Size Scale	Density
26	Medium Hall Too	Rverb Time	HF Damping	Size Scale	Density
27	Ball Hall	Rverb Time	HF Damping	Size Scale	Density
28	Sweet Hall	Rverb Time	HF Damping	Size Scale	Density
29	Small Hall	Rverb Time	HF Damping	Size Scale	Density
30	Large Hall	Rverb Time	HF Damping	Size Scale	Density
40	Small Wood Booth	Room Type	Size Scale	Treb Freq	Treb Gain
41	With A Mic	Room Type	Size Scale	L PreDelay	R PreDelay
42	PrettySmallPlace	Room Type	Size Scale	HF Damping	DiffAmtScl
43	Natural Room	Room Type	Size Scale	L PreDelay	R PreDelay
44	SmallStudioRoom	Absorption	HF Damping	EarRef Lvl	Late Lvl
45	The Real Room	Rverb Time	HF Damping	Treb Freq	Treb Gain
46	Sizzly Drum Room	Rverb Time	HF Damping	L PreDelay	R PreDelay
47	ClassRoom	Rverb Time	HF Damping	Treb Freq	Treb Gain
48	AnotherRealRoom	Rverb Time	HF Damping	L PreDelay	R PreDelay
49	Big Studio Room	Absorption	LF Split	EarRef Lvl	Late Lvl
50	Real Big Room	Rverb Time	HF Damping	LF Split	LF TimeScl

ID	Effect	Param1	Param2	Param3	Param4
51	My Garage	Absorption	Late Lvl	Treb Freq	Treb Gain
52	Half Bath	Rverb Time	HF Damping	E DfDlyScl	E DiffAmt
53	School Stairwell	Absorption	HF Damping	L PreDelay	R PreDelay
54	Small Hall	Rverb Time	EarRef Lvl	L PreDelay	R PreDelay
55	Classic Chapel	Rverb Time	HF Damping	L PreDelay	R PreDelay
56	Semisweet Hall	Rverb Time	HF Damping	EarRef Lvl	Late Lvl
57	Reflective Hall	Rverb Time	EarRef Lvl	Treb Freq	Treb Gain
58	Smooth Hall	Rverb Time	HF Damping	L PreDelay	R PreDelay
59	Sweet Hall	Rverb Time	EarRef Lvl	L PreDelay	R PreDelay
60	Spacious Hall	EarRef Lvl	HF Damping	L PreDelay	R PreDelay
61	Opera House	Rverb Time	HF Damping	EarRef Lvl	Late Lvl
62	Real Niceverb	Rverb Time	HF Damping	Treb Freq	Treb Gain
63	Splendid Palace	Rverb Time	Late Lvl	EarRef Lvl	EarRefDiff
80	Weighty Platey	Rverb Time	HF Damping	EarRef Lvl	LF TimeScl
81	Classic Plate	Rverb Time	HF Damping	EarRef Lvl	Late Lvl
90	Gated Reverb	Rverb Time	Gate Time	GateThresh	GateReleas
91	Gate Plate	Rverb Time	Gate Time	GateThresh	GateReleas

Delay

ID	Effect	Param1	Param2	Param3	Param4
100	Complex Echo	L Fbk1 Dly	L Fbk2 Dly	R Fbk2 Dly	
101	Stereo Echoes	L Fbk1 Dly	R Fbk1 Dly	L Fbk2 Dly	R Fbk2 Dly
102	4-Tap Delay	Dly Tempo	Fdbk Level	Tap2 Level	Tap4 Level
103	8-Tap Delay	Dly Tempo	Fdbk Level	HF Damping	LoopLength
104	Spectral 4-Tap	Dly Tempo	Tap2 Pitch	Tap3 Pitch	Tap4 Pitch
105	Astral Taps	Dly Tempo	Tap2 Pitch	Tap3 Pitch	Tap4 Pitch

Chorus

Chorus

ID	Effect	Param1	Param2	Param3	Param4
120	Stereo Chorus1	LFO Rate	LFO Depth	Fdbk Level	L/R Phase
121	Stereo Chorus2	LFO Rate	Chor Shape	Fdbk Level	L/R Phase
122	Basic Chorus	L LFO Rate	R LFO Rate	L LFODepth	R LFODepth
123	Chorus Comeback	L LFODepth	R LFODepth	L TapDelay	R TapDelay
124	Chorusier	L LFO Rate	R LFO Rate	LFdbk Lvl	R Fdbk Lvl
125	SlowSpinChorus	L LFO Rate	R LFO Rate	L Fdbk Lvl	R Fdbk Lvl
126	Everyday Chorus	L LFO Rate	R LFO Rate	L LFODepth	R LFODepth
127	Soft Chorus	L LFO Rate	R LFO Rate	L TapLevel	R TapLevel
128	Thick Chorus	L LFO1Dpth	R LFO1Dpth	L LFO2Dpth	R LFO2Dpth
129	Rock Chorus	L LFO Rate	R LFO Rate	L TapLevel	R TapLevel

Reference

PC2 Effects and Effects Parameters

Flange

ID	Effect	Param1	Param2	Param3	Param4
150	Big Slow Flange	LFO Period	LFO TempoFdbk Level	L/R Phase	
151	Sweet Flange	LFO Period	LFO Tempo	Fdbk Level	L/R Phase
152	Throaty Flange	LFO Period	LFO Tempo	HF Damping	
153	Squeeze Flange	LFO Period	LFO Tempo	Fdbk Level	L/R Phase
154	Simply Flange	LFO Period	LFO Tempo	Fdbk Level	L/R Phase
155	Wetlip Flange	LFO Period	Fdbk Level	StatDlyLvl	StatDlyTim

Phase

ID	Effect	Param1	Param2	Param3	Param4
180	Slow Deep Phaser	LFO Rate	LFO Depth	CenterFreq	L/R Phase
181	Saucetan Phaser	LFO Rate	LFO Depth	CenterFreq	Fdbk Level
182	Circles	LFO Rate	LFO Depth	NotchLFORt	NotchDepth

Chorus + Delay

200–233 can be combined to create Chorus/Delay/Reverb multi-effects

ID	Effect	Param1	Param2	Param3	Param4
200	BasicChorusDelay	Mix Chorus	Ch FdbkMix DelayDly Tempo		
201	Doubler & Echo	Ch Depth L	Ch Depth R	Mix Delay	Dly Tempo
202	FastChorusDouble	Mix Chorus	Ch Rate L	Ch Rate R	Mix Delay
203	Chorus Slapbacks	Mix Chorus	Mix Delay	Dly TempoDly	LFDamp
204	Chorus PanDelay	Mix Chorus	Ch Fdbk	Mix DelayDly Tempo	
205	Chorused Taps	4 Tap Tempo	4Tap Fdbk	Tap1 Delay	Tap3 Delay
206	MultiEchoChorus	Ch Rate L	Ch Rate R	Dly Time LDly Time R	

Chorus + Reverb

ID	Effect	Param1	Param2	Param3	Param4
210	Chorus Air	Ch Rate L	Ch Rate R	Ch Depth LCh Depth R	
211	ChorusSmallRoom	Ch Rate L	Ch Rate R	L Mix Rverb	R Mix Rverb
212	ClassicEP ChorRm	Ch Rate L	Ch Rate R	L Mix Rverb	R Mix Rverb
213	Chorus HiCeiling	Ch Delay L	Ch Delay R	Rverb Time	Mix Reverb
214	Chorus MiniHall	Ch Fdbk L	Ch Fdbk R	Rverb Type	Rverb Time
215	Chorus PercHall	Ch Rate L	Ch Rate R	Rverb Type	Rverb Time
216	ChorusMedChamber	Ch Depth L	Ch Depth R	Rverb Time	Rvb HFDamp
217	VanillaChorRvb	Mix Chorus	Rverb Time	Rvb HFDamp	Mix Reverb
218	SoftChorus Hall	Ch Rate L	Ch Rate R	Rverb Time	Mix Reverb
219	Chorus SlowHall	Mix Chorus	Ch Delay L	Ch Delay R	Rverb Time
220	ChorBigBrtPlate	Ch Rate L	Ch Rate R	Rvb HFDamp	Mix Reverb

Chorus + Delay + Reverb

ID	Effect	Param1	Param2	Param3	Param4
230	ChorusDelayHall	Dly Tempo	Rverb Type	Rverb Time	Rvb HFDamp
231	ChorDlyRvb Lead	Dly Time L Dly Time R	Rverb Type	Rverb Time	
232	Fluid ChorDlyRvb	Dly Fdbk L	Dly Fdbk R	Rverb Time	Rvb HFDamp
233	DeepChorDlyHall	Ch Rate L	Ch Rate R	Dly Tempo	Rverb Time

Flange + Delay

250–283 can be combined to create Flange/Delay/Reverb and other multi-effects

ID	Effect	Param1	Param2	Param3	Param4
250	Flange Delay	Fl Rate	Mix Delay	Dly Time L	Dly Time R
251	ThroatyFlangeDly	Fl Rate	Mix Delay	Dly Time L	Dly Time R
252	Slapback Flange	Fl Rate	Fl Fdbk L	Fl Fdbk R	Mix Delay

Flange + Reverb

ID	Effect	Param1	Param2	Param3	Param4
260	Flange Booth	Fl Rate L	Fl Rate R	Rverb Type	Rverb Time
261	Flange Room	Fl Tempo	Fl Fdbk L	Fl Fdbk R	Mix Reverb
262	SlowFlangeVerb	Fl Tempo	Fl Fdbk LF	I Fdbk R	Mix Reverb
263	Flange TheatreMix Flange	Rverb Time	Rvb HFDamp	Mix Reverb	
264	Flange Hall	Fl Tempo	Mix Flange	Rverb Time	Rvb HFDamp

Reference

PC2 Effects and Effects Parameters

Flange + Delay + Reverb

ID	Effect	Param1	Param2	Param3	Param4
270	FlangeDelayRoom	Fl Tempo	Fl Phase R	Dly Tempo	Rvb HFDamp
271	SloFlangeDlyRoom	Dly Tempo	Dly Fdbk L	Dly Fdbk R	Rvb HFDamp
272	FlangeDelayHall	Dly Tempo	Rvr Time	L Mix Rvr	R Mix Rvr
273	FlangeDlyBigHall	Fl Rate	Dly Tempo	Rvr Time	Rvb HFDamp

Flange and Other

ID	Effect	Param1	Param2	Param3	Param4
280	Flange->LaserDly	Fl Rate	Fl Fdbk	Mix Delay	Dly Tempo
281	FlangeTap Synth	Fl Rate	Mix 4Tap	4Tap Tempo	4T LoopLen
282	Lazertag Flange	Fl Tempo	Dly Tempo	LsrCntourL	LsrCntourR
283	Shaper->Flange	Shp Amount	Out Gain	Fl Rate	Fl Fdbk

Filters

ID	Effect	Param1	Param2	Param3	Param4
300	Bass Env Filter	Min Freq	Freq Sweep	Resonance	Threshold
301	EPno Env Filter	Freq Sweep	FilterType	Resonance	Threshold
302	Phunk Env Filter	Min Freq	Freq Sweep	ResonanceThreshold	
303	Trip Filter	LFO Period	FilterType	Min Freq	Max Freq
304	LFO Sweep Filter	LFO Period	FilterType	Min Freq	Max Freq
305	LFO Sweep Filt2	LFO Period	R Phase	Resonance	Max Freq
306	DoubleRiseFilter	LFO Period	FilterType	LFO Shape	Max Freq
307	Circle Bandsweep	LFO Period	Resonance	Min Freq	Max Freq

Laserverb

ID	Effect	Param1	Param2	Param3	Param4
320	Cheap LaserVerb	Fdbk Lvl	Delay Contour	Spacing	
321	Spry Young BoyFdbk	LvlDelay	Contour	Spacing	
322	LaserDelay->Rvb	Dly Tempo	LsrCntourL	LsrCntourR	Mix Reverb
323	LazerfazerEchoesF	dbk Lvl	Delay	Contour	Spacing
324	Drum Neurezonate	Fdbk Lvl	Delay	Contour	Spacing

Distortion

ID	Effect	Param1	Param2	Param3	Param4
330	SuperShaper	Shp Amoun	tOut Gain	None	None
331	SubtleDrumShape	Low Amount	Mid Amoun	tHi Amoun	tOut Gain
332	2 Band Shaper	CrossOver	Low Amount	Hi Amount	Out Gain
333	Shaper->Reverb	Shp Amount	Shp Lopass	Rverb Time	Rvb HF Damp
334	SubtleDistortion	Dist Drive	Warmth	Highpass	Out Gain
335	Synth Distortion	Dist Drive	Mid1 Gain	Treb Gain	Out Gain
336	Dist Cab EPiano	Dist Drive	Warmth	Cab Preset	Out Gain
337	Distortion+EQ	Dist Drive	Warmth	Mid2 Gain	Out Gain
338	Quantize+FlangeQuantizLvl	Mix Flange	Fl Period	Fl Fdbk	

Enhancer

ID	Effect	Param1	Param2	Param3	Param4
350	3 Band Enhancer	Hi Drive	Mid Drive	Low Drive	Out Gain
351	Extreem EnhancerHi/Md Xovr	Hi Drive	Mid Drive	Low Drive	

Compressor

ID	Effect	Param1	Param2	Param3	Param4
360	HKCompressor 3:1	Ratio	Threshold	MakeUpGain	Attk Time
361	DrumKompress 5:1	Ratio	Threshold	MakeUpGain	Attk Time
362	SKFdbkComprs 6:1	RatioThreshold	MakeUpGain	Attk Time	
363	SKCompressr 12:1	Ratio	Threshold	MakeUpGain	Attk Time

Simple Motion

ID	Effect	Param1	Param2	Param3	Param4
370	Tremolo	Trem Rate	Trem Depth	Trem ShapeL/R	Phase
371	Simple Panner	LFO Rate	LFO Shape	PanWidth	ImageWidth
372	Dual Panner	L LFO Rate	R LFO Rate	L PanWidth	R PanWidth

Spatial

ID	Effect	Param1	Param2	Param3	Param4
380	SRS	Center	Space	Bass Gain	Treb Gain
381	Mono->Stereo	CenterGain	Pan High	Pan Mid	Pan Low
382	Widespread	CenterGain	Diff Gain	DfBassFreq	DfBassGain
383	Wide Space	Rverb Type	Rvb Diffus	Ch Delay L	Ch Delay R

Reference

PC2 Effects and Effects Parameters

Rotary Speaker

ID	Effect	Param1	Param2	Param3	Param4
390	VibChor+Rotary1	Vibr/Chor	Low Rate	High Rate	HiResonate
391	VibChor+Rotary2	Vibr/Chor	Low Rate	High Rate	Roto InOut
392	VC+Dist+Rotary1	Vibr/Chor	Low Rate	High Rate	Dist Drive
393	VC+Dist+Rotary2	Vibr/Chor	Low Rate	High Rate	Dist Drive
394	VC+Dist+Rotary3	Vibr/Chor	Low Rate	High Rate	Dist Drive
395	VC+Tube+Rotary1	Vibr/Chor	Low Rate	High Rate	Tube Drive
396	VC+Tube+Rotary2	Vibr/Chor	Low Rate	High Rate	Tube Drive

MIDI Implementation Chart

Model: Kurzweil PC2, PC2X

Manufacturer:
Young Chang
Digital Synthesizers

Date: 3/1/00
Version 1.0

Function	Transmitted	Recognized	Remarks	
Basic Channel	Default	1	1	
	Changed	1 - 16	1 - 16	
Mode	Default	Multi*	Multi* memorized memorized	
	Messages			
	Altered			
Note Number	0-127	0-127	key range	
True Voice	1-128	1-128	C 0-C 8	
Velocity	Note ON	O	O	
	Note OFF	O	O	
After Touch	Keys	X	X	
	Channels	O	O	
Pitch Bender	O	O		
Control Change**	0 , 32	O	O	
	1	O	O	
	2	O	O	
	4	O	O	
	6, 38	O	O	
	7	O	O	
	10	O	O	
	11	O	O	
	15, 47	O	O	
	21, 53	O	O	
	64	O	O	
	66	O	O	
	67	O	O	
	91	O	O	
	92	O	O	
	93	O	O	
	94	O	O	
	96	O	O	
	97	O	O	
	98, 99	O	O	
	100, 101	O	O	
Program Change	116	O	O	
	117	O	O	
	118	O	O	
	119	O	O	
	120	O	O	
	121	O	O	
	O	0-127	O	
	True #	0-127	0-127	
System Exclusive	O	O	O*	
System Common	Song Pos.	X	X	
	Song Sel.	X	X	
	Tune	X	X	
System Real Time	Clock	O	O	
	Messages	O	O	
Aux Messages	Local Control	O	O	
	All Notes Off	O	O	
	Active Sense	X	X	
	Reset	X	X	
Notes	*Manufacturer's ID = 07 Device ID: default = 0; programmable 0-127		*Use Multi to assign different programs to each MIDI channel **The PC2 can send any control change	

Mode 1: Omni On, Poly
Mode 3: Omni Off, Poly

Mode 2: Omni On, Mono
Mode 4: Omni Off, Mono

O = yes
X = no

Appendix C

PC2 Programs and Controller Assignments

Factory Controller Assignments

Slider A	MIDI91 FX-A Depth
Slider B	MIDI93 FX-B Depth
Slider C	MIDI06
Slider D	MIDI13
SW1	Octave Shift
SW2	MIDI09
SW3	MIDI12
SW4	Arp On/Off
SW5	MIDI29
MW	MIDI01
Mpress	MIDI33
Breath/CCPed2	MIDI02
Ribbon	MIDI21/53 Pitchbend
CCPed1	MIDI11 Expression
CCPed2	MIDI04 Foot
FtSw1	MIDI64 Sustain
FtSw2	MIDI66 Sost
FtSw3	MIDI67 Soft

Programs and Controllers

ID	0
Program Name	ClassGrand
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	1
Program Name	Stereo Grand
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	2
Program Name	Dynamic Grand
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	3
Program Name	Warm Grand
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	4
Program Name	Solo Grand Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

PC2 Programs and Controller Assignments

Programs and Controllers

ID	5
Program Name	ClassicalGrand 2
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	6
Program Name	Mono Grand Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	7
Program Name	Piano for layers
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	8
Program Name	Stereo Rock Pno
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	9
Program Name	Rock Grand
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	10
Program Name	Sustain Grand440
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	11
Program Name	Mono Stage Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	12
Program Name	Dyn Stage Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	13
Program Name	Ragtime Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped

ID	14
Program Name	Tack Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Tack Level
Slider D	Vibrato Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Vibrato
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	15
Program Name	Piano & Strings
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	Strings Level
SW1	Octave Shift
SW2	Enable Vibrato
SW4	Arp On/Off
SW5	Lyr Disable (Strings)
MW	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	soft ped-pno

ID	16
Program Name	Classic E Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Sample Start
SW4	Arp On/Off
SW5	Impact
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Bass Boost
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

ID	17
Program Name	serious classic
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Tremolo Rate
SW1	Octave Shift
SW4	Arp On/Off
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	18
Program Name	Stage E Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Enable Thump
SW4	Arp On/Off
SW5	Impact
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

PC2 Programs and Controller Assignments

Programs and Controllers

ID	19
Program Name	Hard E Pno
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Enable Thump
SW4	Arp On/Off
SW5	Impact
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

ID	20
Program Name	E Piano PF
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Disable release
SW4	Arp On/Off
SW5	Disable Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

ID	21
Program Name	Dyno E Pno
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Hi Freq Cut
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Fast Decay
SW4	Arp On/Off
SW5	Impact
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	LoPass Freq Cut
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

ID	22
Program Name	Soft E Piano Pad
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq Cut
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Layer Enable (Pad)
SW4	Arp On/Off
SW5	Disable Chorus Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal
FtSw4	ArpLatch

ID	23
Program Name	Hybrid E Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Disable Thump
SW4	Arp On/Off
SW5	Impact
MW	Tremolo Depth
Breath/CCPed2	Timbre
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

ID	24
Program Name	CM Wurly 2g
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Disable Thump
SW4	Arp On/Off
SW5	Impact/Thump Lvl
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto

ID	25
Program Name	ProtoWURLY
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Sample Start
SW4	Arp On/Off
SW5	Enable Detuned Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto

ID	26
Program Name	Brkfst In Korea
Slider C	Timbre
Slider D	Tremolo Rate
SW2	Sample Start
SW3	Disable Detuned Layer
SW5	Impact
MW	Tremolo Depth
FtSw3	Soft Pedal

ID	27
Program Name	Soft Wurly
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Sample Start
SW4	Arp On/Off
SW5	Impact
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

ID	28
Program Name	Multi E Pno
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Sample Start
SW4	Arp On/Off
SW5	Impact
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

ID	29
Program Name	Funky Touch EP
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Envelope Ctl
SW4	Arp On/Off
SW5	Impact
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto

ID	30
Program Name	Digital E Piano
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Sample Start
SW4	Arp On/Off
SW5	Disable Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Soft Pedal
FtSw3	Soft Pedal

ID	31
Program Name	Rich Digital EP
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Envelope Ctl
SW4	Arp On/Off
SW5	Disable Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

PC2 Programs and Controller Assignments

Programs and Controllers

ID	31
Program Name	Rich Digital EP
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Envelope Ctl
SW4	Arp On/Off
SW5	Disable Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	Timbre
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Pedal

ID	32
Program Name	C3PO
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Sample Start
SW4	Arp On/Off
SW5	Enable Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	33
Program Name	Digi E Grand
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Attack Control
SW4	Arp On/Off
SW5	Disable Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	34
Program Name	Electric Grand
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Attack Control
SW4	Arp On/Off
SW5	Disable Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	35
Program Name	FantAsmAtron
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Attack Control
SW4	Arp On/Off
SW5	Disable Layer
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	36
Program Name	AtmAz
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Attack Ctrl
SW1	Octave Shift
SW2	Release Control
SW4	Arp On/Off
SW5	Switch Layers
MW	Vibrato Rate
Mpress	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	37
Program Name	Celestial Comet
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Treble Cut
Slider D	Trem/Vib Rate
SW1	Octave Shift
SW2	Release Control
SW4	Arp On/Off
SW5	Switch Layers
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	38
Program Name	DYN Comper
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	Resonance
SW1	Octave Shift
SW2	Octave Drop
SW4	Arp On/Off
SW5	Impact
MW	"Vibrato Rate, Depth"
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	39
Program Name	Ruth Buzzy
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq Cut
Slider D	Tremolo+Rate
SW1	Octave Shift
SW2	Resonance Boost
SW4	Arp On/Off
SW5	Decay Control
MW	Vibrato
Mpress	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	40
Program Name	Clav Classic
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Bass Level
Slider D	HiPass LFO Rate
SW1	Octave Shift
SW2	Disable Release
SW4	Arp On/Off
SW5	Layer Switch
MW	HiPass LFO Depth
Ribbon	Pitch Bend
CCPed1	Expression
CCPed2	HiPass LFO Depth
FtSw1	Sustain
FtSw2	Sostenuto

ID	41
Program Name	Touch Clav
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Impact
SW1	Octave Shift
SW4	Arp On/Off
SW5	Layer Switch
MW	BandPass LFO Rate
Mpress	Timbre
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	42
Program Name	Dual Wah Clav
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Bandpass Width
Slider D	LFO2 Rate
SW1	Octave Shift
SW4	Arp On/Off
SW5	LFO => MW
MW	Bandpass Freq(SW5)
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

PC2 Programs and Controller Assignments

Programs and Controllers

ID	43
Program Name	Harpsichord
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Sample Start
SW1	Octave Shift
SW2	Disable Release
SW3	Disable Velocity
SW4	Arp On/Off
SW5	Octave Switch
MW	Decay Control
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Octave Switch

ID	44
Program Name	Modrn Harpsi
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Decay Control
SW1	Octave Shift
SW4	Arp On/Off
SW5	Enable Release
MW	"LoPass Freq, Layer Detune"
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	45
Program Name	CrystalClavchd
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Treble Cut
Slider D	Sample Start
SW1	Octave Shift
SW2	Decay Control
SW4	Arp On/Off
SW5	Layer Switch
MW	Layer 1 Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	46
Program Name	Accordion
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Disable Layer
SW4	Arp On/Off
SW5	Attack Control
MW	Swell
Mpress	Swell
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	47
Program Name	Celesta
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW2	Decay Control
SW4	Arp On/Off
SW5	Impact
MW	LoPass Freq
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	48
Program Name	The Reverend's
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	Layer XFade
SW1	Octave Shift
SW2	FX Vib/Chr On/Off
SW4	Arp On/Off
SW5	VAST Rotary On/Off
MW	FX/VAST Rotary Ramp Speed Ctl
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	FX/VAST Rotary Ramp Speed Ctl

ID	49
Program Name	Ballad Of 3 Bars
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Perc XFade
Slider D	Bass Cut
SW1	Octave Shift
SW2	FX Vib/Chr On/Off
SW3	VAST Chr/Vib On/Off
SW4	Arp On/Off
SW5	VAST Rotary On/Off
MW	FX/VAST Rotary Ramp Speed Ctl
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	FX/VAST Rotary Ramp Speed Ctl

ID	50
Program Name	Prog Rocker's B
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Perc XFade
SW1	Octave Shift
SW2	FX Vib/Chr On/Off
SW4	Arp On/Off
SW5	VAST Rotary On/Off
MW	FX/VAST Rotary Ramp Speed Ctl
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	FX/VAST Rotary Ramp Speed Ctl

ID	51
Program Name	All Out Full On
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
SW1	Octave Shift
SW2	FX Vib/Chr On/Off
SW4	Arp On/Off
SW5	VAST Rotary On/Off
MW	FX/VAST Rotary Ramp Speed Ctl
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	FX/VAST Rotary Ramp Speed Ctl

ID	52
Program Name	Grungy Overdrive
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
SW1	Octave Shift
SW2	FX Vib/Chr On/Off
SW3	VAST Chr/Vib On/Off
SW4	Arp On/Off
SW5	VAST Rotary On/Off
MW	FX/VAST Rotary Ramp Speed Ctl
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	FX/VAST Rotary Ramp Speed Ctl

ID	53
Program Name	Uptown Gospel
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Para EQ Freq
Slider D	Para EQ Cut
SW1	Octave Shift
SW2	FX Vib/Chr On/Off
SW4	Arp On/Off
SW5	VAST Rotary On/Off
MW	FX/VAST Rotary Ramp Speed Ctl
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	FX/VAST Rotary Ramp Speed Ctl

ID	54
Program Name	Retro Roto
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Xtra Hi Freq
SW1	Octave Shift
SW2	FX Vib/Chr On/Off
SW3	VAST Chr/Vib On/Off
SW4	Arp On/Off
SW5	VAST Rotary On/Off
MW	FX/VAST Rotary Ramp Speed Ctl
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	FX/VAST Rotary Ramp Speed Ctl

PC2 Programs and Controller Assignments

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ID	55
Program Name	Pipe Organ
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Layer XFade
Slider D	Layer XFade
SW1	Octave Shift
SW4	Arp On/Off
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	56
Program Name	Big Brass
Slider C	LoPass Freq
Slider D	Attack Control
SW2	Layer Switch
SW5	Layer Switch
MW	Vibrato Depth
Mpress	Swell Env & Pitch
Breath/CCPed2	LoPass Freq
CCPed2	LoPass Freq

ID	57
Program Name	Saxes/Trumpets
Slider C	LoPass Freq
Slider D	Attack Control
SW2	Layer Switch
SW3	Layer Switch
SW5	Layer Switch
MW	Vibrato Depth
Mpress	Swell Env & Pitch
Breath/CCPed2	LoPass Freq
CCPed2	LoPass Freq

ID	58
Program Name	Split Sections
Slider C	LoPass Freq
Slider D	Attack Control
SW2	Layer Switch
SW5	Layer Switch
MW	Vibrato Depth
Mpress	Swell Env & Pitch
Breath/CCPed2	Timbre
CCPed2	Timbre

ID	59
Program Name	Broadway Brass
Slider C	LoPass Freq
Slider D	Attack Control
SW5	Layer Switch
MW	Vibrato Depth
Mpress	Swell Env & Pitch
Breath/CCPed2	LoPass Freq

ID	60
Program Name	Trombones
Slider C	Timbre
Slider D	Attack Control
SW5	Layer Switch
MW	Vibrato Depth
Mpress	Swell Env & Pitch
Breath/CCPed2	LoPass Freq
CCPed2	LoPass Freq

ID	61
Program Name	The Two Tenors
Slider C	LoPass Freq
Slider D	Attack Control
SW2	Layer Switch
SW5	Layer Switch
MW	Vibrato Depth
Mpress	Swell Env & Pitch
Breath/CCPed2	LoPass Freq
CCPed2	LoPass Freq

ID	62
Program Name	Solo Tenor Sax
Slider C	LoPass Freq
Slider D	Attack Control
MW	Vibrato Depth
Mpress	Vibrato Depth

ID	63
Program Name	Empyre Brass
Slider C	LoPass Envelope
SW2	Layer Switch
SW3	Layer Switch
SW5	Layer Switch
MW	Vibrato Depth
Mpress	Swell Envelope

ID	64
Program Name	Lyrical Strings
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Brightness
SW1	Octave Shift
SW4	Arp On/Off
SW5	Envelope
MW	Attack Switch
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	65
Program Name	Slow Strings
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Brightness (Cut)
Slider D	Attack Control
SW1	Octave Shift
SW4	Arp On/Off
SW5	Layer Switch
MW	Slow Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	66
Program Name	Articulate Strin
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Brightness (Cut)
Slider D	Envelope Control
SW1	Octave Shift
SW2	Attack Control
SW4	Arp On/Off
SW5	Envelope Control
MW	Envelope Switch
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Envelope Switch

ID	67
Program Name	Layer Strings
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Brightness
Slider D	Release Control
SW1	Octave Shift
SW2	Layer Switch(w/Sw5)
SW3	Layer Switch(w/Sw5)
SW5	Mono => Stereo
MW	Attack Control
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	68
Program Name	Pam's Fast Strin
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Release Control
SW1	Octave Shift
SW4	Arp On/Off
MW	Layer Switch
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Layer Switch

ID	69
Program Name	Touch Strings
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Envelope Control
SW1	Octave Shift
SW4	Arp On/Off
SW5	Layer Switch
MW	Tremelo
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	70
Program Name	Velocity Strings
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
SW1	Octave Shift
SW4	Arp On/Off
MW	Layer Switch
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Layer Switch

ID	71
Program Name	Phantom Strings
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Attack Control
SW1	Octave Shift
SW2	Layer Switch
SW3	Layer Switch
SW4	Arp On/Off
SW5	Layer Switch
MW	Envelope Control
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Envelope Control

ID	72
Program Name	Ooh><Aah
Slider C	Timbre
Slider D	Layer XFade
SW5	Layer Switch
MW	Vibrato
Mpress	Layer XFade
Breath/CCPed2	Timbre
CCPed2	Timbre

PC2 Programs and Controller Assignments

Programs and Controllers

ID	73
Program Name	Doo><Daa
Slider C	Timbre
Slider D	Layer XFade
SW5	Layer Switch
MW	Vibrato
Mpress	Layer XFade
Breath/CCPed2	Timbre
CCPed2	Timbre

ID	74
Program Name	Baa stacc. Bop
Slider D	Envelope Control
SW5	Layer Switch
MW	Vibrato
Mpress	Swell
Breath/CCPed2	Swell
CCPed2	Timbre

ID	75
Program Name	Doo stacc. Doop
Slider D	Envelope Control
SW5	Layer Switch
MW	Vibrato
Mpress	Swell
Breath/CCPed2	Swell
CCPed2	Timbre

ID	76
Program Name	Daa stacc. Dot
Slider D	Envelope Control
SW5	Layer Switch
MW	Vibrato
Mpress	Swell
Breath/CCPed2	Swell
CCPed2	Timbre

ID	77
Program Name	Scatman Caruther
SW5	Envelope Control
MW	Vibrato
Mpress	Swell
Breath/CCPed2	Swell
CCPed2	Timbre

ID	78
Program Name	The Croons
Slider C	Timbre
SW5	Layer Switch
MW	Vibrato

ID	79
Program Name	Cathedral Voices
Slider C	Brightness (Cut)
Slider D	Envelope Control
SW5	Layer Enable
MW	Brightness (Cut)

ID	80
Program Name	Solar Lead
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	LoPass Resonance
SW1	Octave Shift
SW4	Arp On/Off
SW5	Layer Switch
MW	"Vibrato Rate, Depth"
Mpress	"Vibrato Rate, Depth"
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	81
Program Name	Vox Lead
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	LoPass Resonance
SW1	Octave Shift
SW2	Rel. Layer off
SW3	Octave Jump w/Sw5
SW4	Arp On/Off
SW5	Layer Enable
MW	"Vibrato Rate, Depth"
Mpress	"Vibrato Rate, Depth"
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	82
Program Name	Alazawi
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Envelope
Slider D	LoPass Resonance
SW1	Octave Shift
SW4	Arp On/Off
SW5	Layer Transpose (5ths)
MW	"Vibrato Rate, Depth"
Mpress	"Vibrato Rate, Depth"
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	83
Program Name	Slo Wood Flute
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Breath Noise
Slider D	Chiff Noise
SW1	Octave Shift
SW4	Arp On/Off
SW5	"Layer Enable ("ooh")"
MW	Tremolo Depth (Cut)
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	84
Program Name	DIG DAT DOW
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LowPass Freq
Slider D	LoPass Resonance
SW1	Octave Shift
SW2	Release Control
SW3	Layer Delay
SW4	Arp On/Off
SW5	Octave Layer Enable
MW	Vibrato Depth
Mpress	Vibrato Rate
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	85
Program Name	1/3 Pulse Bass
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LowPass Freq
Slider D	LoPass Resonance
SW1	Octave Shift
SW2	Release Control
SW3	Impact
SW4	Arp On/Off
SW5	Octave Layer Enable
MW	"Vibrato Rate, Depth"
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	86
Program Name	Porky Bass
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LowPass Freq
Slider D	LoPass Resonance
SW1	Octave Shift
SW2	Release Control
SW3	Octave Layer Enable
SW4	Arp On/Off
SW5	Stereo Layer Enable
MW	Vibrato Depth
Mpress	Vibrato Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	87
Program Name	Deep HooHoo Bass
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LowPass Freq
Slider D	LoPass Resonance
SW1	Octave Shift
SW2	Release Control
SW3	Impact
SW4	Arp On/Off
SW5	Octave Divide
MW	"Vibrato Rate, Depth"
Mpress	"Vibrato Rate, Depth"
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	88
Program Name	Rez Aah
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	LoPass LFO Rate
SW1	Octave Shift
SW2	Release Control
SW4	Arp On/Off
SW5	Timbre (Envelope)
MW	Vibrato
Mpress	Swell (Layer 3)
Breath/CCPed2	Swell (Layer 3)
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

PC2 Programs and Controller Assignments

Programs and Controllers

ID	89
Program Name	Crypt
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Timbre
SW1	Octave Shift
SW2	Release Control
SW4	Arp On/Off
SW5	Vibrato Rate Env
MW	"Vibr, Pan/Fltr LFO"
Mpress	"Vibr, Pan/Fltr LFO"
Breath/CCPed2	Pan LFO Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	90
Program Name	Meteor Strings
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	LoPass Resonance
SW1	Octave Shift
SW2	Release Control
SW3	Attack Control
SW4	Arp On/Off
SW5	Vibrato Rate Env
MW	"Vibrato, Trem Depth"
Mpress	Brightness
Breath/CCPed2	LoPass Freq
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	91
Program Name	Orch Pad
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Filter Freq
Slider D	Filter LFO Rate
SW1	Octave Shift
SW2	Release Control
SW3	Layer Switch
SW4	Arp On/Off
SW5	Attack Control
MW	Vibrato
Mpress	Horn Layer Swell
Breath/CCPed2	Horn Layer Swell
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	92
Program Name	Slo Syn Orch
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	""Chiff"" Level"
Slider D	Env Control
SW1	Octave Shift
SW4	Arp On/Off
SW5	Layer Disable
MW	Tremolo Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	93
Program Name	Analogy
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	LP Res & Release
SW2	Attack Control
SW4	Arp On/Off
SW5	Layer Enable
MW	"Vibrato Rate, Depth"
Mpress	Swell
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	94
Program Name	Paddy LaBelle
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	LoPass Resonance
SW1	Octave Shift
SW2	Release Control
SW4	Arp On/Off
SW5	Attack Control
MW	Filter LFO Depth
Mpress	Swell
Breath/CCPed2	Swell
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	95
Program Name	La Grande Jatte
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	LoPass Resonance
SW1	Octave Shift
SW2	Release Control
SW3	Layer Switch
SW4	Arp On/Off
SW5	Attack Control
MW	Vibrato/Trem
Mpress	Vibrato/Trem
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	96
Program Name	Acoustic Guitar
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	EQ Ctr Freq
Slider D	EQ Cut/Boost
SW1	Octave Shift
SW2	Envelope Control
SW4	Arp On/Off
SW5	Sample Start
MW	Vibrato
Mpress	Vibrato Rate
Breath/CCPed2	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	97
Program Name	Strummer 12 Str
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Brightness
Slider D	Vibrato Rate
SW1	Octave Shift
SW2	Envelope Control
SW4	Arp On/Off
SW5	Layer Detune
MW	Vibrato
Breath/CCPed2	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	98
Program Name	Rich 6 Str Gtr
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Vibrato Rate
SW1	Octave Shift
SW2	Envelope Control
SW4	Arp On/Off
SW5	Stereo Image
MW	Vibrato
Breath/CCPed2	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	99
Program Name	OI' 12 Str Gtr
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	EQ Ctr Freq
Slider D	EQ Cut/Boost
SW1	Octave Shift
SW2	Envelope Control
SW4	Arp On/Off
SW5	Layer Detune
MW	Vibrato
Mpress	Vibrato Rate
Breath/CCPed2	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

ID	100
Program Name	Chorus Elec Gtr
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Tremolo Rate
SW1	Octave Shift
SW2	Envelope Control
SW4	Arp On/Off
SW5	Disable Layer Detune
MW	Tremolo Depth
Breath/CCPed2	LFO2 Depth
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped

PC2 Programs and Controller Assignments

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ID	101
Program Name	Elec 12 String
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Envelope Control
SW1	Octave Shift
SW2	FX Vib/Chor On/Off
SW3	Layer Disable
SW4	Arp On/Off
SW5	Enable Leslie
MW	Leslie Rate Switch
Breath/CCPed2	Tremolo
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Soft Ped
FtSw4	ArpLatch
ID	102
Program Name	335 VelSw Slide
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Attack Control
Slider D	Decay Control
SW1	Octave Shift
SW2	Filter Env Control
SW3	Layer Switch
SW4	Arp On/Off
SW5	Enable Slide Layer
MW	Vibrato
Breath/CCPed2	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw2	Sostenuto
FtSw3	Envelope Control
ID	103
Program Name	Rock Gtr Lead
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre (Dist)
Slider D	Timbre (Tone)
SW1	Octave Shift
SW2	Disable FB Layer
SW4	Arp On/Off
SW5	Feedback in 5ths
MW	Vibrato
Mpress	Feedback Amount
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Release Control

ID	104
Program Name	Round and Wound
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq (Cut)
Slider D	Attack Control
SW1	Octave Shift
SW2	Impact
SW4	Arp On/Off
SW5	Layer Enable(Ride)
MW	Vibrato
Mpress	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	105
Program Name	Punch Bass
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq
Slider D	Attack Control
SW1	Octave Shift
SW2	Layer Disable
SW4	Arp On/Off
SW5	"LoPass Res, Freq"
MW	Vibrato
Mpress	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	106
Program Name	Two Finger Bass
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	LoPass Freq (Cut)
SW1	Octave Shift
SW2	Impact
SW4	Arp On/Off
SW5	Impact
MW	Vibrato
Mpress	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	107
Program Name	Tri Bass
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
SW1	Octave Shift
SW2	Layer Enable
SW4	Arp On/Off
SW5	Layer Enable(Ride)
MW	Vibrato
Mpress	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	108
Program Name	Clav o' Bass
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
SW1	Octave Shift
SW2	Layer Disable
SW4	Arp On/Off
MW	Vibrato
Mpress	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	109
Program Name	Syn Fretless
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
SW1	Octave Shift
SW2	Layer Disable
SW4	Arp On/Off
SW5	Timbre
MW	Vibrato
Mpress	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	110
Program Name	Upright Bass 1
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Timbre (Cymbal)
SW1	Octave Shift
SW4	Arp On/Off
SW5	Layer Enable(Ride)
MW	Ride Cymbal Volume
Mpress	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	111
Program Name	Upright Bass 2
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Timbre (Cymbal)
SW1	Octave Shift
SW2	Layer Disable
SW4	Arp On/Off
SW5	Layer Enable(Ride)
MW	Ride Cymbal Volume
Mpress	Vibrato
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	112
Program Name	Studio Drums 1+2
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Pitch Control
SW1	Octave Shift
SW2	Decay Control
SW3	Layer Switch
SW4	Arp On/Off
SW5	Sample Start
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	113
Program Name	Studio Drums 3+4
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Pitch Control
SW1	Octave Shift
SW2	Decay Control
SW3	Layer Switch
SW4	Arp On/Off
SW5	Sample Start
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

PC2 Programs and Controller Assignments

Programs and Controllers

ID	114
Program Name	Ambient Rock Kit
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Pitch Control
SW1	Octave Shift
SW2	Decay Control
SW3	Layer Switch
SW4	Arp On/Off
SW5	Sample Start
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	117
Program Name	Triplet/Trashkit
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Pitch Control
SW1	Octave Shift
SW2	Envelope Control
SW3	Layer Switch
SW4	Arp On/Off
SW5	Sample Start
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	115
Program Name	Coliseum Kit
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Pitch Control
SW1	Octave Shift
SW2	Decay Control
SW3	Pitch Drop
SW4	Arp On/Off
SW5	Sample Start
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	118
Program Name	Beat Box
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Pitch Control
SW1	Octave Shift
SW2	Decay Control
SW3	Layer Switch
SW4	Arp On/Off
SW5	Sample Start
MW	"Env/Lyr, Pitch LFO"
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Lyr Enable/Pitch LFO

ID	116
Program Name	Resonant Traps
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Pitch Control
SW1	Octave Shift
SW2	Envelope Control
SW3	Pitch Up
SW4	Arp On/Off
SW5	Sample Start
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	119
Program Name	Electro Kit
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Timbre
Slider D	Pitch Control
SW1	Octave Shift
SW2	Decay Control
SW3	Layer Switch
SW4	Arp On/Off
SW5	Attack Control
MW	Layer Enable
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Layer Enable

ID	120
Program Name	Virtuoso Perc
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Pitch Control
Slider D	Shaker Rate (f1-c2)
SW1	Octave Shift
SW4	Arp On/Off
MW	Muting
Mpress	Moose Pitch/Mute
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Sample Start

ID	121
Program Name	Rhythm Maker
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Pitch Control
Slider D	PitchCtrl Via MPrs
SW1	Octave Shift
SW2	Layer Disables
SW3	Layer Disable
SW5	Layer Disable
MW	Sample Start
Mpress	PitchCtl (Sw2/SosPed)
CCPed1	Expression
FtSw1	Off
FtSw2	Off
FtSw3	Sample Start

ID	122
Program Name	Woody Marimba
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Sample Start
SW1	Octave Shift
SW2	Layer Switch
SW4	Arp On/Off
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Layr Sw to Round Marimba
FtSw2	Off
FtSw3	Sample Start

ID	123
Program Name	African Marimba
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	Lyr Enable (Shaker)
SW1	Octave Shift
SW4	Arp On/Off
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto

ID	124
Program Name	Vibes
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Tremolo Rate
Slider D	Layer Switch
SW1	Octave Shift
SW2	Envelope Control
SW4	Arp On/Off
SW5	Layer Enable (Sine)
MW	Tremolo
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Sample Start

ID	125
Program Name	New Fluid Vibes
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider C	Tremolo Rate
SW1	Octave Shift
SW2	Stereo Spread
SW4	Arp On/Off
SW5	Sample Start
MW	Tremolo
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Sample Start

ID	126
Program Name	Aborigine Jam
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
SW1	Octave Shift
SW4	Arp On/Off
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Sample Start

ID	127
Program Name	Drums 'n Bells
Slider A	FX-A Wet/Dry
Slider B	FX-B Wet/Dry
Slider D	PitchCtrl via MPrs
SW1	Octave Shift
SW4	Arp On/Off
SW5	Sample Start
Mpress	PitchCtl (Sw2/SosPed)
Ribbon	Pitch Bend
CCPed1	Expression
FtSw1	Sustain
FtSw2	Sostenuto
FtSw3	Sample Start

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