SP4

Musician's Guide
for the SP4-7, SP4-8, and SP76-II

KURZWEIL®

Part Number 910529 Rev. A

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE THE COVER
NO USER SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

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

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.

IMPORTANT SAFETY & INSTALLATION INSTRUCTIONS

INSTRUCTIONS PERTAINING TO THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

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

1. Read all of the Safety and Installation Instructions and Explanation of Graphic Symbols before using the product.

2. This product must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This product is equipped with a power supply cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet which is properly installed and grounded in accordance with all local codes and ordinances.

   DANGER: Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Do not modify the plug provided with the product - if it will not fit the outlet, have a proper outlet installed by a qualified electrician. Do not use an adaptor which defeats the function of the equipment-grounding conductor. If you are in doubt as to whether the product is properly grounded, check with a qualified serviceman or electrician.

3. **WARNING:** This product is equipped with an AC input voltage selector. The voltage selector has been factory set for the mains supply voltage in the country where this unit was sold. Changing the voltage selector may require the use of a different power supply cord or attachment plug, or both. To reduce the risk of fire or electric shock, refer servicing to qualified maintenance personnel.

4. 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.

5. This product should only be used with a stand or cart that is recommended by the manufacturer.

6. 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.

7. The product should be located so that its location or position does not interfere with its proper ventilation.

8. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.

9. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

10. 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.

11. The power supply cord of the product should be unplugged from the outlet when left unused for a long period of time. When unplugging the power supply cord, do not pull on the cord, but grasp it by the plug.

12. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

13. The product should be serviced by qualified service personnel when:
    A. The power supply cord or the plug has been damaged;
    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.

14. 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.

15. **WARNING:** Do not place objects on the product's power supply cord, or place the product in a position where anyone could trip over, walk on, or roll anything over cords of any type. Do not allow the product to rest on or be installed over cords of any type. Improper installations of this type create the possibility of a fire hazard and/or personal injury.

RADIO AND TELEVISION INTERFERENCE

WARNING: Changes or modifications to this instrument not expressly approved by Young Chang could void your authority to operate the instrument.

IMPORTANT: When connecting this product to accessories and/or other equipment use only high quality shielded cables.

NOTE: This instrument has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This instrument generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this instrument does cause harmful interference to radio or television reception, which can be determined by turning the instrument off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the instrument and the receiver.
- Connect the instrument into an outlet on a circuit other than the one to which the receiver is connected.
- If necessary consult your dealer or an experienced radio/television technician for additional suggestions.

NOTICE

This apparatus does not exceed the Class B 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 B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

SAVE THESE INSTRUCTIONS

Important Safety Instructions

1) Read these instructions

2) Keep these instructions.

3) Heed all warnings.

4) Follow all instructions.

5) Do not use this apparatus near water.

6) Clean only with dry cloth.

7) Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.

8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11) Only use attachments/accessories specified by the manufacturer.

12) Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13) Unplug this apparatus during lightning storms or when unused for long periods of time.

14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Warning: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.

To completely disconnect this equipment from the AC Mains, disconnect the power supply cord plug from the AC receptacle.

Kurzweil International Contacts

Contact the Kurzweil office listed below to locate your local Kurzweil representative.

American Music & Sound
5304 Derry Avenue #C
Agoura Hills
California 91301 USA

telephone: (800) 994-4984
fax: (818) 597-0411
Email: Info@AmericanMusicAndSound.com

Kurzweil Co., LTD
iPark Building #102, Floor 9
Jeongja-Dong 9, Bundang-Gu
Soungnam-Shi, Gyeonggi-Do 463-859
South Korea

www.ycpiano.co.kr
www.youngchang.com
www.kurzweil.com

TECHNICAL SUPPORT
Email: support@Kurzweil.com

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Chapter 1
Introduction

Congratulations on your purchase of a Kurzweil SP4!

This manual will help you get acquainted with your new instrument. Be sure to keep the manual on hand as you continue to familiarize yourself with the features and functions of the SP4. Note that this manual applies to the SP4-7, SP4-8, and the SP76-II. For the sake of simplicity, the instrument will be referred to as the SP4.
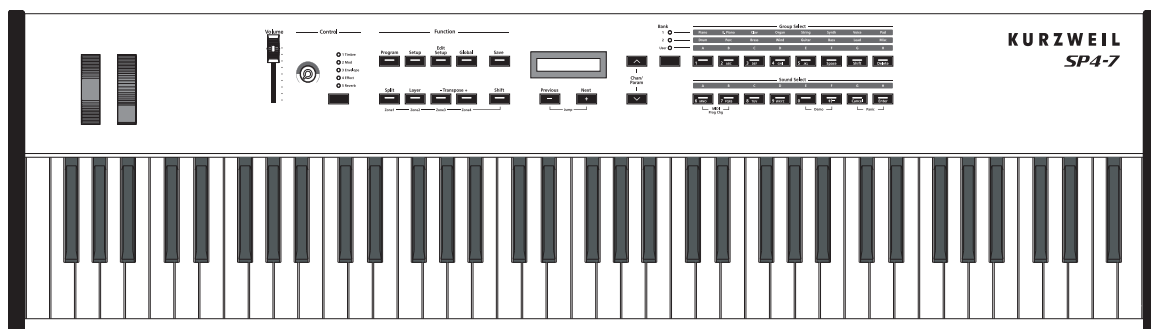
Main Features

The SP4 is a professional performance instrument. It boasts 128 excellent sounds (including the famous Kurzweil Grand Piano) already on-board and ready to be played. It is also a capable MIDI controller ideally suited for controlling additional sound modules and as input to a sequencer.

Keyboard and Controllers

The SP4 has 76-key semi-weighted keyboard action that provides you with a piano-like feel without adding substantial weight to the instrument. The array of physical controllers includes:

- a pitch wheel
- a modulation wheel

- an assignable control knob, which can control a parameter of your choosing

- on the rear panel, two jacks for optional pedal controllers: one for a switch pedal and the other for a continuous controller pedal.

Pedals (Optional)

As described above, the SP4 has two jacks on the rear panel for optional pedal controllers. One of these jacks is for one or two switch pedals, which are typically used to control two-state (i.e., on / off) parameters such as sustain and mute zone. The other jack is for a continuous control (or CC) pedal typically used to control multi-state (i.e., "continuous") parameter such as filter frequency or LFO amount.

Note that switch pedals can be used to control continuous parameters just as continuous control pedals can be used to control two-state parameters.

Your Kurzweil dealer stocks the following pedals:

- FS-1   Standard box-shaped switch pedal
- KFP-1   Single piano-style switch pedal
- KFP-2S   Double piano-style switch pedal unit (one stereo plug)
- CC-1   Continuous pedal

Staying Current

Be sure to check the Kurzweil Music Systems website at www.Kurzweil.com for new documentation and software updates before using your new instrument.

Do You Have Everything?

Your SP4 package should contain the following in addition to your instrument:

- Power cable and 15V power adapter
- Sustain pedal
- USB cable (Type-A-to-Type-B)
- *Musician's Guide* (this book)
- Warranty card

If you don't have all of these components, be sure to contact your Kurzweil / Young Chang dealer.

Chapter 2
Getting Started

This chapter will help you hook up your SP4 to your sound system and MIDI system. If hooking up new gear is familiar to you, then simply read the following two sections in this chapter. If you need more information, then be sure to read this chapter in its entirety.

Before You Start…

Don't connect anything until you make sure your SP4 is properly and safely situated. If your SP4 has been out in the cold, give it time to warm up to room temperature before starting it, since condensation may have formed inside the SP4.

Quick Start

Make Connections

1. Set the keyboard on a hard, flat, level surface.

2. Four adhesive-backed rubber feet are provided with your SP4. If you want to attach them to the bottom of the SP4 (recommended to prevent scratching your tabletop), carefully turn the keyboard over, remove the paper backing from the rubber feet and attach them near each corner all on the same level.

3. Connect the power cable to the adapter then plug the adapter's DC power cord into your SP4. Finally, plug the power cable into the wall.

4. Make sure your sound system is at a safe volume level. Also make sure that the SP4's MASTER VOLUME slider (on the far left side of the front panel) is all the way down.

5. Plug in a pair of stereo headphones or run standard (1/4-inch) audio cables from your amplifier or mixer to the Audio Outputs on the SP4 (use the Left out for mono). Balanced ("TRS" or "Stereo") cables are recommended.

Use Your SP4

1. Power up your SP4 first, and then raise the MASTER VOLUME slider. The SP4 starts up in Program mode by default. Press one of the Function buttons to the left of the display to switch Modes.

2. If you hear distortion, reduce the gain on your mixing board, or use the pad (a switch that decreases the input audio signal level, typically by 20dB) if it has one.

3. Scroll through the program list with the Previous and Next buttons under the display, or with the dedicated Bank, Group Select, and Sound Select buttons, and try the SP4's many sounds. Take note that the User Bank is initially empty.

Start Up Details:
The Rear Panel

All of the connections take place on the rear panel of the SP4, pictured below:
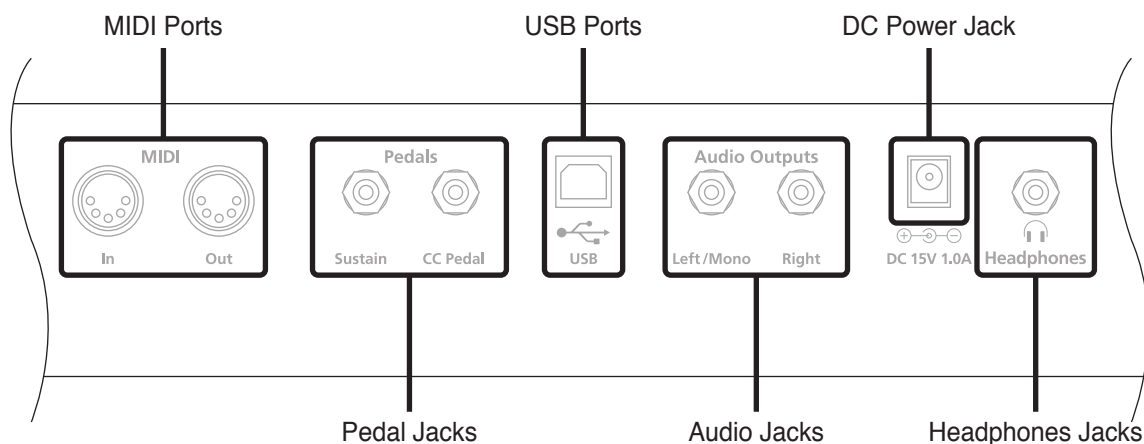
The MIDI (IN and OUT) Ports

Use the MIDI ports to communicate with other MIDI modules and controllers. The OUT port is the MIDI transmitting port, and the IN port is the MIDI receiving port.

The Pedal Jacks

Use the two pedal jacks to connect controller pedals to the SP4.

The Sustain (FOOT SW) Jack

Use the FOOT SW jack to connect a switch pedal. A switch pedal is a physical controller typically used to control two-state (i.e., "on / off") parameters, such as sustain and mute zone. Note that switch pedals can be used to control "continuous" parameters as well.

The jack will also accept a dual switch pedal having a single stereo plug that is available separately (Kurzweil KFP-2S). For more information on connecting pedals, see *Connecting Pedals on page 2-5*.

The CC PEDAL Jack

Use the CC PEDAL jack to connect a continuous control (or CC) pedal. A CC pedal is a physical controller typically used to control multi-state (i.e., "continuous") parameters such as filter frequency or LFO amount. Note that CC pedals can be used to control "on / off" parameters as well.

For more information on connecting pedals, see *Connecting Pedals on page 2-5* below.

The USB Port

Use the USB port to connect the SP4 to a computer in order to do the following:

- Use the SP4 as a MIDI controller with a sequencer computer program.
- Use the computer to manage the user data contents of the SP4.
- Update the software and sounds of the SP4.

Be sure to check the Kurzweil Music Systems website at www.Kurzweil.com for new documentation and software updates before using your new instrument.

The Audio (LEFT/MONO and RIGHT) Jacks

Use the LEFT/MONO and RIGHT audio jacks to connect the SP4 to your audio system.

The DC Power Jack

Use the DC power jack to connect the DC power supply.

The HEADPHONES Jack

Use the HEADPHONES jack to listen to the SP4 on stereo headphones. You will need a 1/4-inch-to-1/8-inch adapter in order to use headphones with a mini plug.

Connecting the Power Cable (Line Cord)

The SP4 runs on 15 volts DC power. Your dealer will provide the voltage converter and power cord to match the AC power in your area: 100, 120, 230, or 240 volts at 50–60 Hz. Plug the converter into a wall outlet, and then connect the adapter to the DC power jack.

Connecting to Your Audio System

After you've turned down the level on your sound system, connect the SP4's analog audio outputs to your sound system using a pair of stereo or mono audio cables. Mono cables will always work, but if you're going into balanced inputs, use stereo cables for a better signal-to-noise ratio and a bit more volume: the SP4's analog outputs are balanced.

You'll find three 1/4-inch balanced audio output jacks on the rear panel. For now, connect one end of each audio cable to your mixing board or PA system inputs, and connect the other end to the jacks marked LEFT and RIGHT on the rear panel of the SP4. If you have only one input available, use the SP4's Left output to get the full signal in mono. Use the jack marked HEADPHONES to listen to the SP4 on headphones. Note that when headphones are plugged in, sound still comes through the LEFT and RIGHT audio jacks.

SP4 connected to powered speakers and headphones
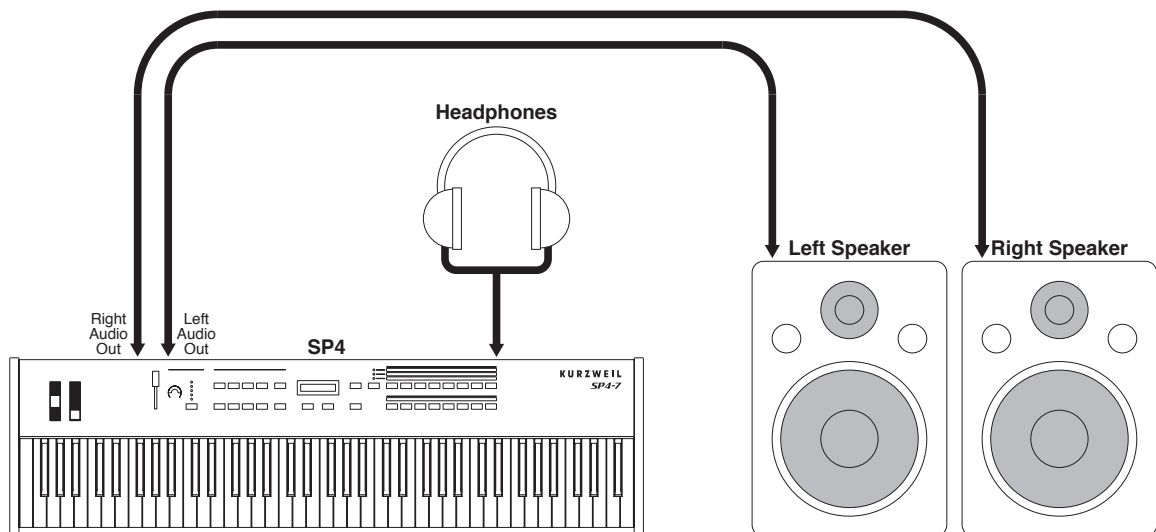
SP4 connected to a mixer, powered speakers and headphones
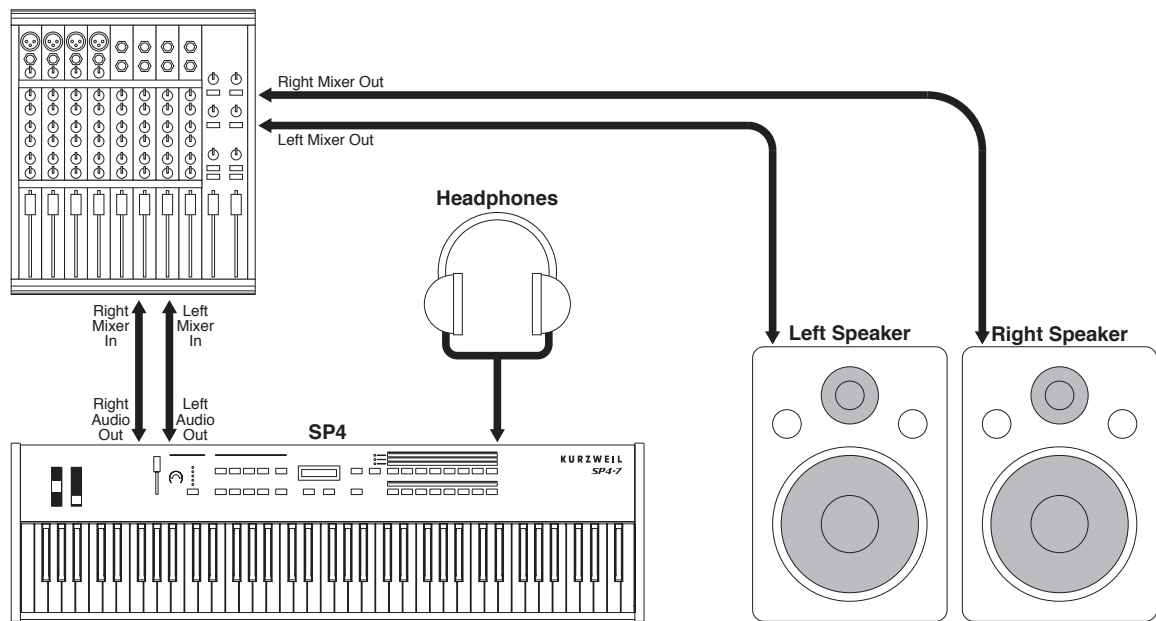
Connecting Pedals

Plug your switch or continuous pedals into the corresponding jacks on the SP4's rear panel. We recommend using the Kurzweil pedals described in *Pedals (Optional) on page 1-2*, but you can use almost any switch or continuous pedal that adheres to the following specifications (as most pedals do):

Switch pedals	1/4-inch tip-sleeve (mono) plug
Continuous (CC) pedals	10-kOhm linear-taper potentiometer, 1/4-inch tip-ring-sleeve (stereo) plug with the wiper connected to the tip

The pedals are independently assignable within each zone of every setup. Here are the default settings for the three pedals you can use with the SP4:

Switch Pedal 1	Controller 64 (Sustain)
Switch Pedal 2	Controller 66 (Sostenuto)
CC Pedal	Controller 11 (Expression / Volume)

NOTE: Be sure not to step on the switch pedals when powering up your Stage Piano!

Connecting a Switch Pedal

When plugged into the FOOTSW jack on the rear-panel, a single switch pedal will, by default, act like a sustain pedal. Of course this can be changed by programming, as described in *Setup Mode on page 7-1*.

If you use a third-party (non-Kurzweil) switch pedal, make sure it's connected before you turn on your SP4. This ensures that the pedal will work properly (it might function in reverse—off when it's down and on when it's up—if you turn on your SP4 before plugging in the pedal). Similarly, don't press any of your switch pedals while powering up, as the SP4 verifies each pedal's orientation during power up—if you're pressing a pedal, you might cause it to work in reverse.

See *Switch Pedal Problems on page 12-5* if you are having trouble with your switch pedal.

Connecting Dual Switch Pedals

The jack will also accept a dual switch pedal having a single stereo plug. The plug should be wired so that the left pedal connects to the ring contact and the right pedal to the tip contact. It's also possible to use two single pedals with this jack: first buy a 1/4-inch stereo-to-dual-mono Y adapter (this will have two mono 1/4-inch phone jacks and a stereo 1/4-inch plug); then, plug the pedal you wish to use for sustain into the left jack and your sostenuto pedal into the right jack. Note that the "left" pedal goes into the right jack and vice-versa.

By default, the right pedal will control sustain as before and the left pedal will control the sostenuto function. If you're not familiar with traditional piano technique, the sostenuto (center) pedal on a grand piano allows one to hold chords in the bass while continuing to play the melody without the latter notes sustaining. Any keys that are down when you depress the pedal will sustain when you let go of the keys, but new notes played afterward will not be sustained. Releasing the pedal puts things back to normal. Of course it can be programmed to do other functions as well.

Connecting a Control Pedal

A control pedal can be very useful for controlling volume, vibrato, or other effect by foot. The Kurzweil CC-1 control pedal will work best with the SP4, but it is also possible to use third-party control pedals designed for synthesizers. Note that a volume pedal may or may not be satisfactory depending on how it is constructed.

See *Control Pedal Problems on page 12-6* if you are having trouble with your control pedal.

Connecting MIDI

In addition to being a performance-suited musical instrument, the SP4 is a powerful, but intuitive and easy-to-use MIDI controller. For descriptions of how to customize your SP4 as MIDI controller, and how to use its MIDI controller capabilities to their fullest potential, see *Setup Mode on page 7-1*.

Basic MIDI Hookup

To use the SP4 as a MIDI controller for another sound module, use a MIDI cable to connect the MIDI port marked "OUT" to the MIDI input port of the module that you want to control.

SP4   **Module**

Out   In
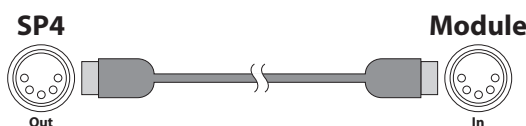
To control the SP4 using another MIDI controller, use a MIDI cable to connect the MIDI port marked "IN" to the MIDI output port of the controller that you will be using.

Module   **SP4**

Out   In
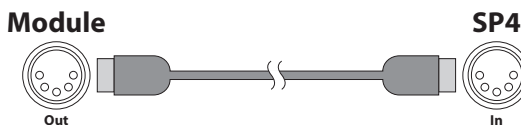
Connecting More Sound Modules

In order to connect multiple sound modules to be controlled by a single MIDI controller, your SP4 must either be (1) used as the controller or (2) be the last module in the MIDI daisy chain. This is because the SP4 does not include a THRU MIDI port; however, this simply means that the SP4 must be at the start or at the end of the MIDI daisy chain.

Using the SP4 as the controller, connect the MIDI OUT port to the MIDI IN port of the first module, and then connect that module's MIDI THRU port to the input of the next module, and so on, until the last module is connected. The MIDI chain should end in the MIDI IN port of the last module.

Scenario 1: SP4 as the MIDI controller

Scenario 2: SP4 as the last module in the MIDI chain
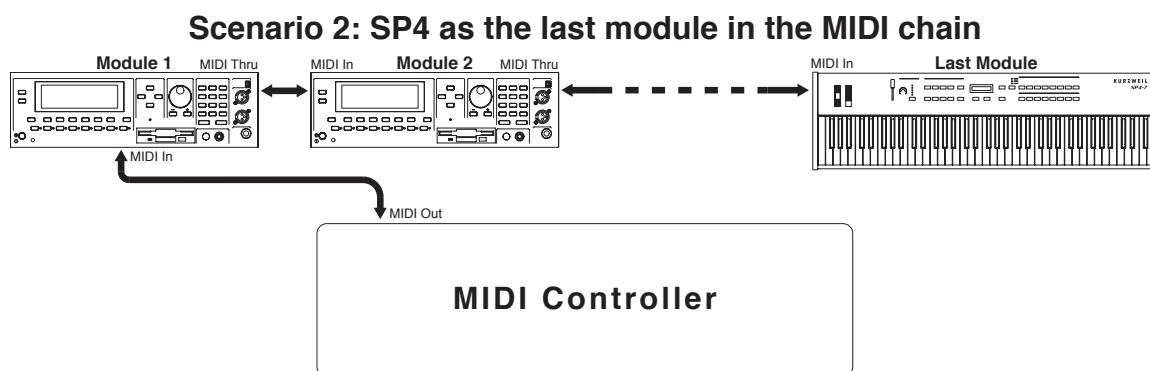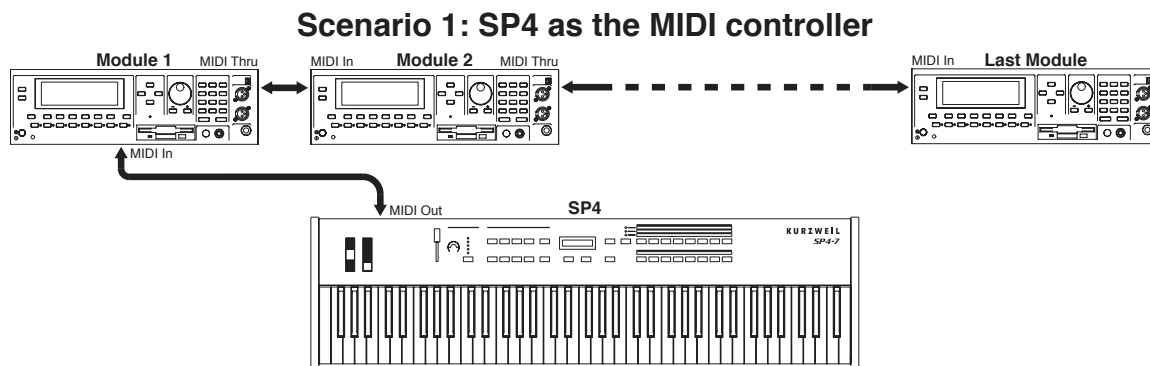
Connecting to a Computer Sequencer

To connect your SP4 to a computer as a MIDI controller, simply connect the SP4 to your computer using the provided cable. If you wish to use your own cable, make sure that it is a Type-A-to-Type-B USB cable (the USB port of the SP4 being Type B). By default, the SP4 will act as a MIDI controller (rather than a hard drive) when connected to a computer.

Type A   Type B
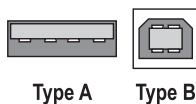
Chapter 3
Features of the SP4

This chapter will help you familiarize yourself with the features of the SP4. Many of these features have both general functions and Mode-specific functions. For more in-depth descriptions of these features, refer to the chapters on the individual Modes.
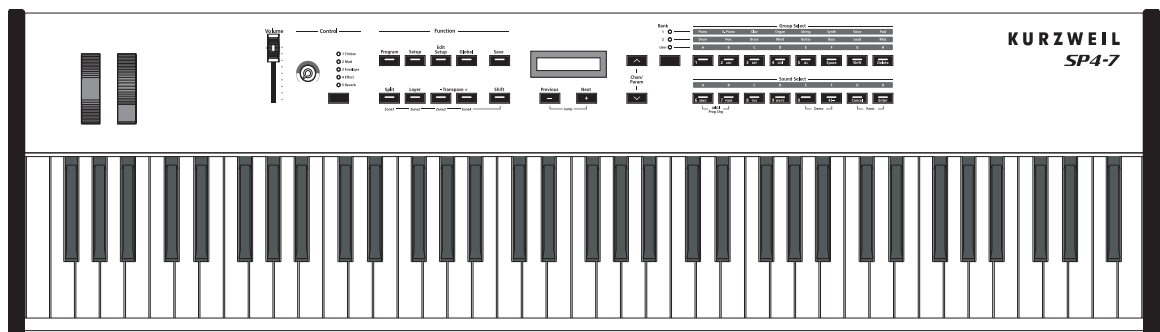
The Front Panel

On the front panel of the SP4 are all of its controls, both musical and navigational.
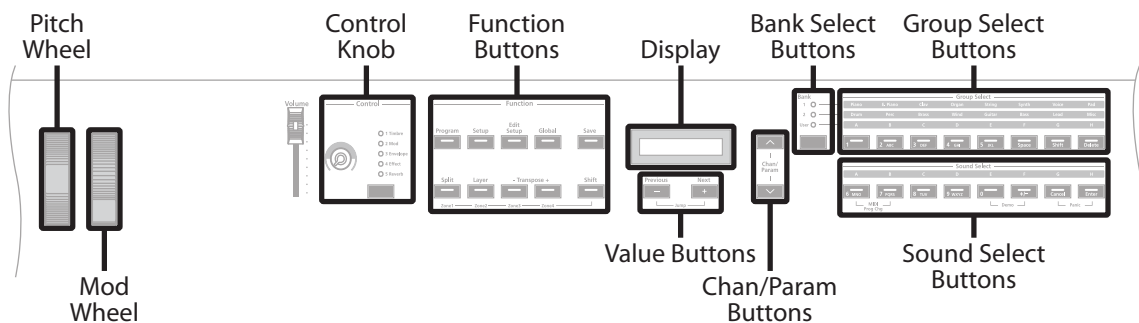
Pitch and Mod Wheels
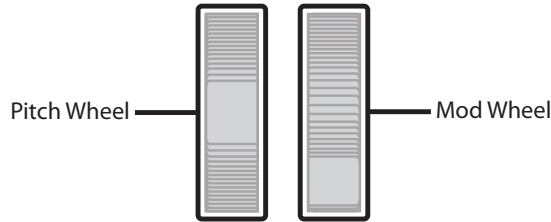
Pitch Wheel

The pitch wheel is the left most of the two wheels. It is spring-loaded, such that its center position is restored when it is not being used. That is because the pitch wheel is used for pitch-bending notes—its "off" position is in the center. Pushing the pitch wheel up bends the pitches of all notes up. Pulling the pitch wheel down bends the pitches of all notes down.

Mod Wheel

The mod wheel is the right most of the two wheels. Unlike the pitch wheel, the mod wheel is not spring loaded, and can be set to and left in any position between fully up and fully down. Typically, the mod wheel is assigned to a parameter that alters some aspect of the sound (e.g., vibrato, filter depth) when changed.

Function Buttons

The Function buttons are located beneath the "Function" label on the left side of the front panel. In addition to changing operating Modes, these buttons serve Mode-specific secondary functions.
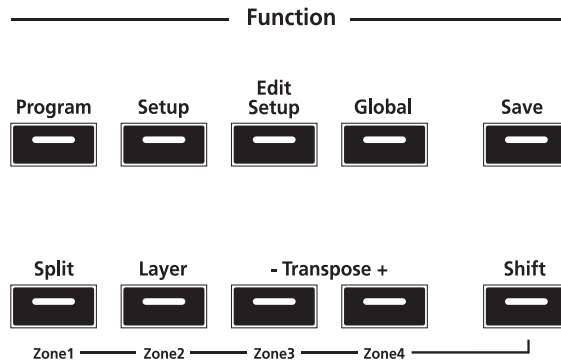
Program Button

Pressing the **Program** button will take you into Program Mode (described in *The Operating Modes on page 5-1* and, in further detail, in *Program Mode on page 6-1*). In Program Mode, you can select and play different sounds (or "Programs").

This button's LED will be illuminated when you are in Program Mode.

Setup Button

Pressing the **Setup** button will take you into Setup Mode (described in *The Operating Modes on page 5-1* and, in further detail, in *Setup Mode on page 7-1*). In Setup Mode, you can select different configurations (or "Setups") of Programs, controller assignments, and MIDI channel assignments.

This button's LED will be illuminated when you are in Setup Mode.

Edit Setup Button

Pressing the **Edit Setup** button will take you into Edit Setup Mode (described in *The Operating Modes on page 5-1* and, in further detail, in *Edit Setup Mode on page 8-1*). In Edit Setup Mode, you can edit or create Setups.

This button's LED will be illuminated when you are in Edit Setup Mode.

Global Button

Pressing the **Global** button will take you into Global Mode (described in *The Operating Modes on page 5-1* and, in further detail, in *Global Mode on page 9-1*). In Global Mode, you can edit parameters that control the entire SP4. These include tuning, transposition, and velocity and aftertouch sensitivity. Additionally, you can perform a hard reset in this Mode.

⚠ **CAUTION:** <u>PERFORMING A HARD RESET WILL DELETE ALL USER-CREATED PROGRAMS, SETUPS, AND GLOBAL SETTINGS.</u>

This button's LED will be illuminated when you are in Global Mode.

Save Button

Pressing the **Save** button will allow you to save any custom Programs or Setups that you've created, or save any changes made to the current Program or Setup. This button's LED will appear illuminated once you have made changes to the current Program or Setup.

Split (Zone 1) Button

Pressing the **Split** button will perform the Split Function. With the Split Function, you can split the keyboard into up to four Zones, and assign different programs, MIDI settings, and transpositions to each Zone. The Split Function is described further in *The Split Function on page 5-4*.

When in Setup Mode, holding down the **Shift** button while pressing the **Split** button will mute or unmute (depending on the state of the zone) Zone 1 of the current setup.

Layer (Zone 2) Button

Pressing the **Layer** button will perform the Layer Function. With the Layer Function, you can layer up to four different programs and setups – each layer is a new Zone, of which you can have a maximum of four. The Layer Function is described further in *The Layer Function on page 5-4*.

When in Setup Mode, holding down the **Shift** button while pressing the **Layer** button will mute or unmute (depending on the state of the zone) Zone 2 of the current setup.

Transpose (Zone 3 and Zone 4) Buttons

Pressing the **Transpose +** button will transpose the current program or setup up by one semitone; pressing the **Transpose –** button will transpose the current program or setup down by one semitone. Pressing both **Transpose +** and **Transpose –** simultaneously will restore the current program or setup to having no transposition; if these two buttons are simultaneously pressed when there is already no transposition, then the current program or setup will be transposed down by one octave (12 semitones).

When in Setup Mode, holding down the **Shift** button while pressing the **Transpose –** button will mute or unmute (depending on the state of the zone) Zone 3 of the current setup. Holding down the **Shift** button while pressing the **Transpose +** button will mute or unmute (depending on the state of the zone) Zone 4 of the current setup.

Shift Button

When in Setup Mode, holding down the **Shift** button activates the secondary functions (i.e., Zone mute) of the **Split**, **Layer**, **Transpose –**, and **Transpose +** buttons. When holding down the **Shift** button, the button of each active zone will be illuminated and the button of each muted zone will be blinking.

The Control Knob

The assignable control knob is a powerful and flexible—yet intuitive—feature of the SP4. It provides you with real-time control of five parameters. In Program Mode and Setup Mode, these parameters are preset. In Edit Setup Mode, you can change what these parameters are.
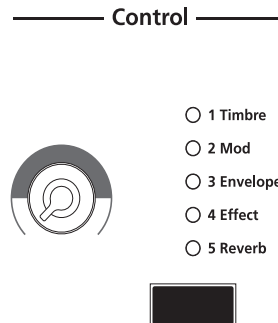
—— **Control** ——

○ 1 Timbre

○ 2 Mod

○ 3 Envelope

○ 4 Effect

○ 5 Reverb

The control knob gives you real-time control of five different parameters—the currently selected parameter is indicated by the column of LEDs. By default these five parameters are:

- 1 Timbre
- 2 Mod
- 3 Envelope
- 4 Effect
- 5 Reverb

You can change what these five parameters are in Edit Setup Mode (see *Edit Setup Mode on page 8-1*).

Pressing the **Control Select** button (located beneath the column of LEDs) changes the currently selected parameter that is affected by the control knob.

Display and Value Buttons

The alphanumeric display and Value buttons below it are located close to the center of the front panel.
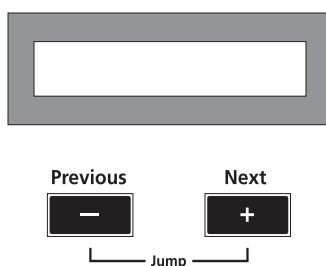
Previous (–) and Next (+) Value Buttons

Use the **Next** and **Previous** buttons to scroll through the list of items on the display. Pressing both the **Next** and **Previous** buttons simultaneously will jump to the first entry of the next category of items in the list. For example, when in Program Mode with program **1 Studio Grand** currently selected, pressing **Next** and **Previous** simultaneously will jump up the list of program to program **8 Stevie's Rhds**, the first of the Electric Piano programs. Pressing the two buttons again will jump up to program **16 Supasticious**, the first of the Clavinet programs.

Chan / Param Buttons

In Program Mode, pressing the **Chan / Param Up (∧)** button will change the MIDI transmit channel from the current channel to the next one; pressing the **Chan / Param Down (∨)** button will change the MIDI transmit channel from the current channel to the previous one.

In the all of the Modes other than Program Mode and Setup Mode—i.e., Edit Setup, Global, and System—pressing the **Chan / Param** buttons will scroll through the parameter list of the current Mode.

Object Select Buttons
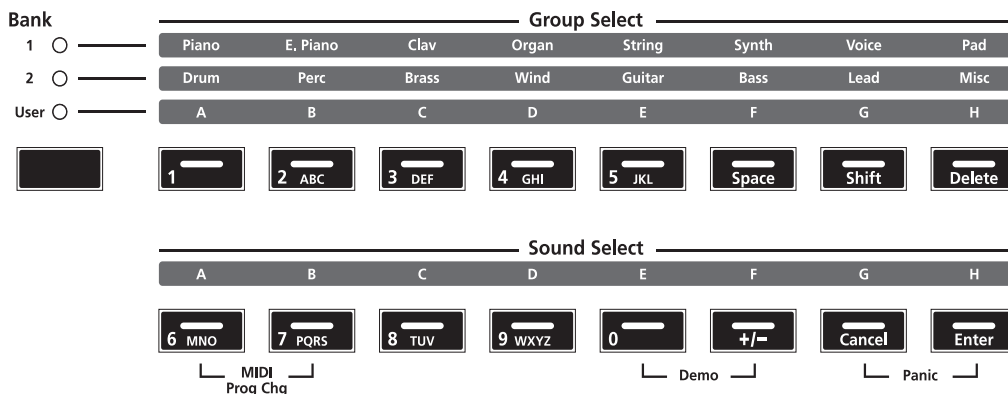
The Object Select Buttons are located on the right side of the front panel. Note that there are three types of Object Select Buttons: Bank Select, Group Select, and Sound Select. The Programs and Setups of the SP4 are organized in three levels of organization: eight Sounds make up a Group, eight Groups make up a Bank. The following figure illustrates this organization using the Program **42 Jump! 0bx** as an example:

For all objects, the currently selected Bank, Group, and Sound are indicated by a lit LED. The example above (**42 Jump! 0bx**)would appear as follows:
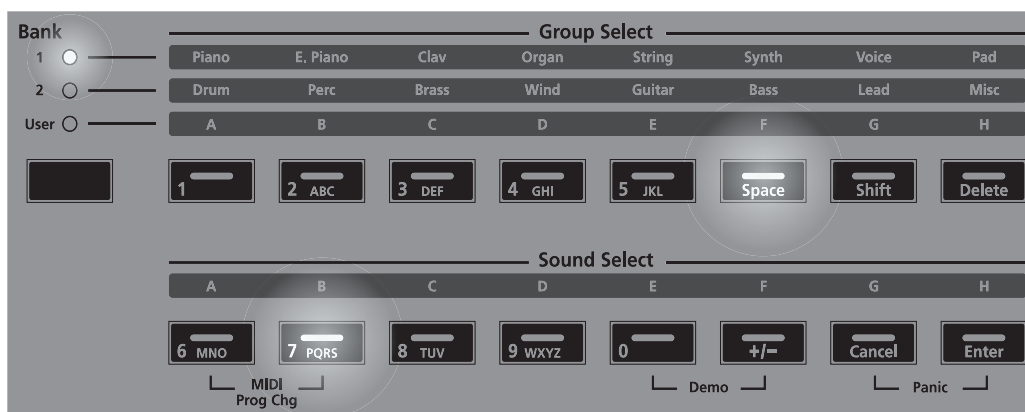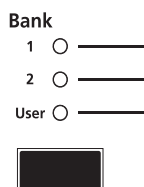
Bank Select Button

Pressing the **Bank Select** button will cycle through the three object banks: Bank 1, Bank 2, and User. The column of LEDs indicates the currently selected bank. In Program Mode, Bank 1 contains programs 0-63, Bank 2 contains programs 64-127, and User Bank contains user-created programs numbered 128-191. In Setup Mode, Bank 1 contains setups 0-63 and User Bank contains user-created setups numbered 64-127.

NOTE: A "Bank" is a SP4-specific term not to be confused with the general "MIDI Bank", which is contains 128 Objects. When transmitting bank change and program change MIDI messages, always think in terms of "MIDI Banks" rather than "Banks".

Group Select Buttons

As pictured below, there are eight **Group Select** buttons. Note that each button corresponds to a different Group depending on the currently selected bank.

Each bank is divided into eight Groups. Pressing the **Group Select** button immediately beneath each Group label will select that Group within the current bank. The LED of the currently selected Group's button will be lit.

Sound Select Buttons

Each of the **Sound Select** buttons corresponds to one Sound in the currently selected Group; pressing one of these buttons will select that Sound. The LED of the currently selected Sound's button will be lit.

Alphanumeric Data Entry

When editing parameters or naming Objects, you can use the Group and Sound Select buttons for alphanumeric data entry. Note that on each button the secondary function is printed in white ink.

			Group Select				
Piano	E. Piano	Clav	Organ	String	Synth	Voice	Pad
Drum	Perc	Brass	Wind	Guitar	Bass	Lead	Misc
A	B	C	D	E	F	G	H
1	2 ABC	3 DEF	4 GHI	5 JKL	Space	Shift	Delete

			Sound Select				
A	B	C	D	E	F	G	H
6 MNO	7 PQRS	8 TUV	9 WXYZ	0	+/−	Cancel	Enter

MIDI Prog Chg   Demo   Panic

Double Button Presses

Several pairs of the buttons on the SP4 have timesaving secondary functions when pressed simultaneously—think of them as keyboard shortcuts. For convenience of reference, descriptions of all of the double-button press functions appear below.

Reset Transposition / Lower by an Octave
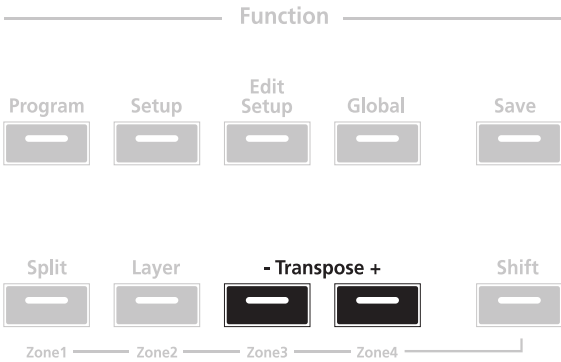
		Function		
Program	Setup	Edit Setup	Global	Save

		- Transpose +		Shift
Split	Layer			

Zone1 ——— Zone2 ——— Zone3 ——— Zone4

Pressing both **Transpose +** and **Transpose –** simultaneously will restore the current program or setup to having no transposition. If these two buttons are simultaneously pressed when there is already no transposition, then the current program or setup will be transposed down by one octave (12 semitones).

Jump Value
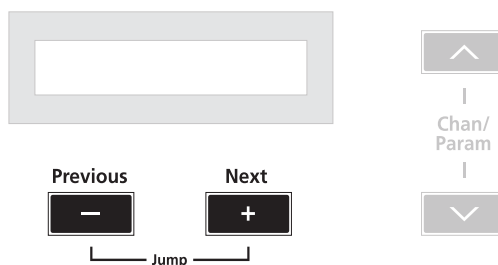
Pressing both **Next** and Previous **Value** buttons simultaneously will jump to the next category of items in the list. For example, when in Program Mode with program **1 Studio Grand** currently selected, pressing **Next** and **Previous** simultaneously will jump up the list of programs to program **8 Stevie's Rhds**, the first of the Electric Piano programs. Pressing the two buttons again will jump up to program **16 Supasticious**, the first of the Clavinet programs.

Jump Parameter

Pressing both the **Chan / Param Up (∧)** and the **Chan / Param Down (∨)** buttons simultaneously will jump to the beginning of the next category of items in the parameter list.

MIDI Program Change
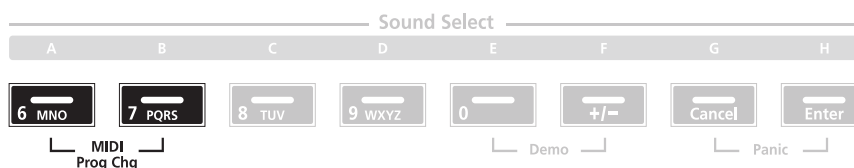
Pressing Sound Select Buttons **A** and **B** takes you to the MIDI Program Change Function page (described in further detail in *MIDI Program Change Function on page 5-5*). With the MIDI Program Change Function, you can send a MIDI Program Change message to any sound modules in a MIDI chain connected to the SP4.

Demo
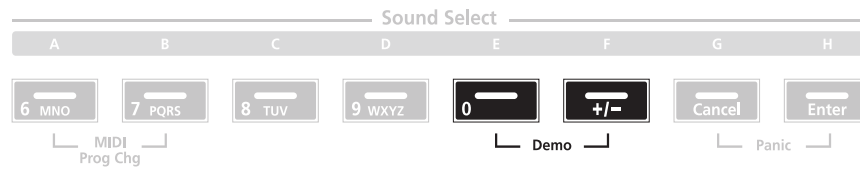
Pressing Sound Select Buttons **E** and **F** performs the Demo Function (described in further detail in *Demo Function on page 5-6*). With the Demo Function, you can hear a demo sequence that showcases many of the features of SP4.

Panic
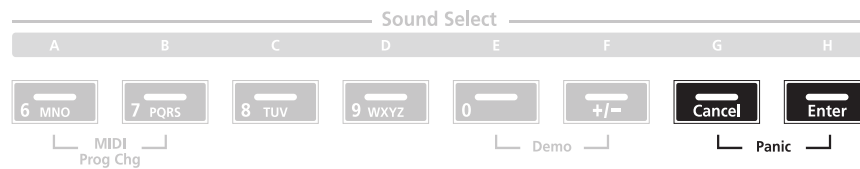
Pressing Sound Select Buttons **G** and **H** deactivates all sounding notes and control messages and sends an "All Notes Off" message to all connected modules.

Chapter 4
Terminology

This chapter provides definitions and descriptions for all of the SP4-specific terms use in this manual. Note that some of the terms are also used by other manufactures. Since there are no standard definitions for some of these terms, they are described here to avoid confusion. All of these terms appear capitalized as proper nouns in this manual to make it easy to distinguish between the generic term and the SP4-specific term.

Object	Anything that can be named, saved, deleted, or edited (i.e., a Program or a Setup). See *Program Mode on page 6-1* and *Setup Mode on page 7-1* for more information on Objects.
Program	A factory-preset or user-programmed sounds stored in ROM or flash memory, each with five parameters that can be changed in real-time with the control knob. See *Program Mode on page 6-1* for more information on Programs.
Setup	A factory-preset or user-programmed MIDI performance presets consisting of up to 4 Zones, each with its own keyboard region, Program, MIDI channel, and controller assignments. See *Setup Mode on page 7-1* for more information on Setups.
Zone	A keyboard region of a Setup that has its own Program, MIDI channel, and controller assignments. See *Setup Mode on page 7-1* for more information on Zones.
Split	A division of Zones in a Setup. See *The Split Function on page 5-4* for more information on Splits.
Layer	An overlap of Zones in a Setup. See *The Layer Function on page 5-4* for more information on Layers.

Bank	The first and highest level of Object organization; contains eight Groups and thus 64 Sounds; different from a "MIDI Bank", which will be referred to as such. See *Using the Object Select Buttons on page 6-3* or *Using the Object Select Buttons on page 7-3* for more information on Banks and Object organization.
MIDI Bank	The highest level of Object organization by the MIDI standard; contains 128 Objects; different from a "Bank".
Group	The second level of Object organization; contains eight Sounds. See *Using the Object Select Buttons on page 6-3* or *Using the Object Select Buttons on page 7-3* for more information on Groups and Object organization.
Sound	The third lowest level of Object organization; can be either a Program or a Setup depending on the current Mode. See *Using the Object Select Buttons on page 6-3* or *Using the Object Select Buttons on page 7-3* for more information on Sounds and Object organization.
Mode	An operating status with a unique group of operations. See *The Operating Modes on page 5-1* for more information on Modes.

Chapter 5
The Operating Modes

This chapter will help you familiarize yourself with the operating modes of the SP4. Each of the five Modes (Program, Setup, Edit Setup, Global, and System) has its own individual chapter—the four Functions (Split, Layer, MIDI Program Change, and Demo) are described in this chapter in *Functions on page 5-4*.

Program Mode

Program mode is the default mode of the SP4. In this mode, you can select, play, and edit programs. To enter Program mode from another mode, press the **Program** Function button.
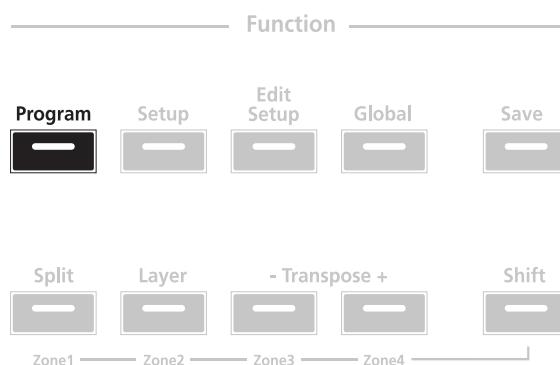
For more detailed information on Program mode, see *Program Mode on page 6-1*.

Setup Mode

Setup mode allows you to select and play setups. Setups are configurations of up to four zones, each of which may have its own program and controller assignments. To enter Setup mode from another mode, press the **Setup** Function button.
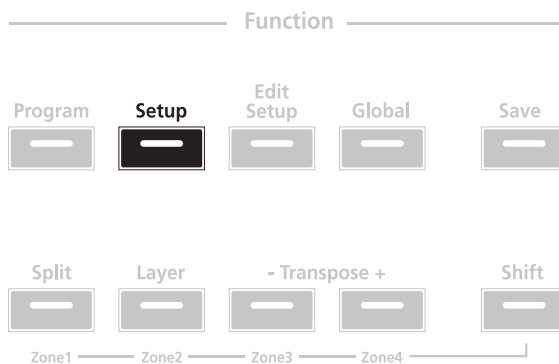
For more detailed information on Setup mode, see *Setup Mode on page 7-1*.

Edit Setup Mode

Edit Setup mode allows you to create setups or edit preexisting setups. To enter Edit Setup mode from another mode, press the **Edit Setup** Function button.
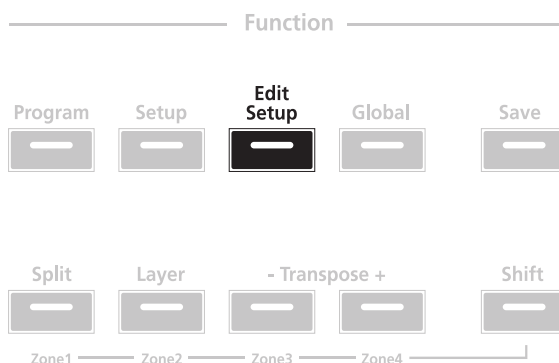
For more detailed information on Edit Setup mode, see *Edit Setup Mode on page 8-1*.

Global Mode

⚠ **CAUTION:** READ *Global Mode on page 9-1* BEFORE USING GLOBAL MODE. THIS MODE CONTAINS CERTAIN OPERATIONS THAT CANNOT BE UNDONE.

Global mode allows you to edit global parameters and MIDI settings, or restore factory defaults with a hard reset. To enter Global mode from another mode, press the **Global** Function button.
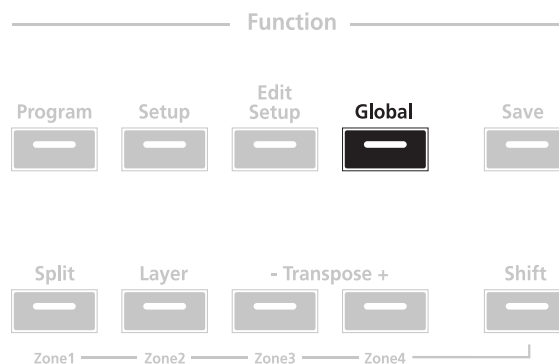
System Mode

⚠ **CAUTION:** READ *System Mode on page 10-1* BEFORE ATTEMPTING TO ENTER SYSTEM MODE. THIS MODE CONTAINS CERTAIN OPERATIONS THAT CANNOT BE UNDONE.

System Mode allows you manage and upgrade the OS software of your SP4 as well as perform diagnostic tests of the instrument's various internal systems and processes. Note that the functions that you have access to in System Mode govern the operation of your SP4, so only use System Mode when you must perform essential maintenance tasks.

To enter System Mode, follow these steps:

1. Power off your SP4.

2. Press and the hold the **Shift** button, and power on the unit. Make sure to keep holding the Shift button unit the text "SP4 bootloader v$x.x$" (where $x.x$ is the version of the bootloader software) scrolls across the display.

3. Release the **Shift** button—at this point, you are in System Mode.

Functions

In addition to the five primary Modes, there are four Functions. These Functions are not as complex as the primary Modes and are described below.

The Split Function

Pressing the **Split** Function button while in either Program or Setup mode will perform the Split Function. The Split Function allows you to split programs and setups such that keys in one region of the keyboard produce different sounds than another region.
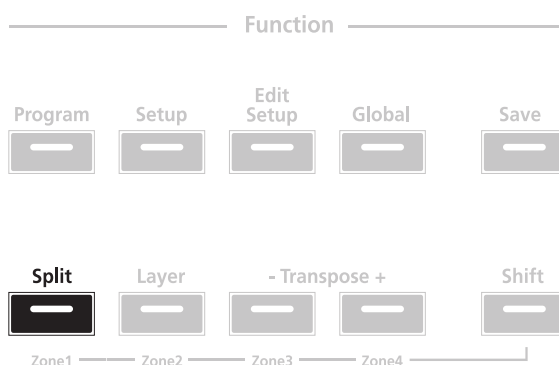
Creating Splits in Program Mode is slightly different from creating Splits in Setup Mode. See *The Split Function on page 6-7* (for Splits in Program Mode) and *The Split Function on page 7-8* (for Splits in Setup Mode).

The Layer Function

Pressing the **Layer** Function button while in either Program or Setup mode will perform the Layer Function. The Layer Function allows you to layer programs and setups such that more than one sound can be produced by striking one key.
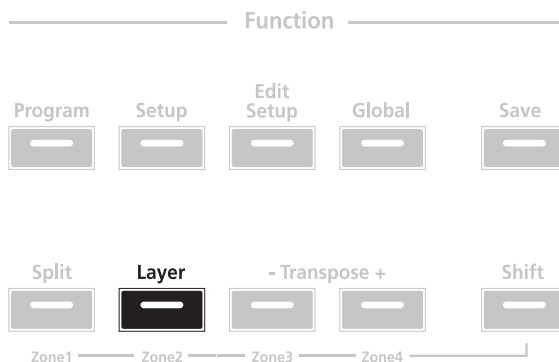
Creating Layers in Program Mode is slightly different from creating Splits in Setup Mode. See *The Layer Function on page 6-9* (for Layers in Program Mode) and *The Layer Function on page 7-9* (for Layers in Setup Mode).

MIDI Program Change Function

Pressing both the Sound Select **A** and Sound Select **B** buttons simultaneously will take you into the MIDI Program Change Function page.
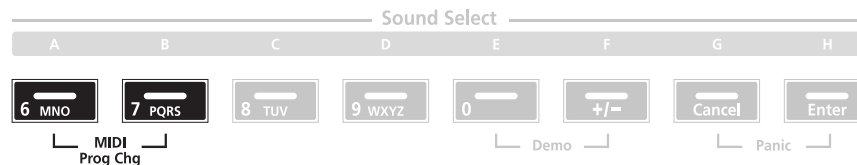
With this Function, you can send a MIDI Program Change message to connected sound modules. Doing so will not affect the local sound (that is, it will not affect the currently selected program on the SP4). Using the secondary functions of the Group Select and Sound Select buttons, you can enter program numbers from **0** to **2,097,152**—this seemingly random number comes from the fact that, by the General MIDI Standard, you can send Program messages for up to **16,384** MIDI Banks, each containing up to **128** programs.

When a message is sent with the MIDI Program Change Function, any Global setting that might disable MIDI Transmit or might disable MIDI Program Change is ignored. After the MIDI Program Change message is sent, the SP4 will automatically return to the previous mode.

A MIDI Program Change message can be canceled by pressing any button other than the Numeric Entry buttons or the Value buttons.

NOTE: A "Bank" is a SP4-specific term not to be confused with the general "MIDI Bank", which is contains 128 Objects. When transmitting MIDI Bank Change and MIDI Program Change messages, always think in terms of "MIDI Banks" rather than "Banks".

Differing Program Numbers

If the programs on your connected sound module are organized by MIDI Bank with each program number being between **0** and **127**, then use the following formula to determine what number to enter for the MIDI Program Change Function:

$$[MIDI\ Bank\ number] * 128 + [program\ number] - 1$$

So for example, if you want to send to a MIDI Program Change message for **Program 83** in **MIDI Bank 4**, you would enter the number **594**—this number is equal to 4 * 128 + 83 - 1.

If the programs on your connected sound module are organized by MIDI Bank with each program number being between **1** and **128**, then use the following formula to determine what number to enter in MIDI Program Change mode:

$$[\textit{MIDI Bank number}] * 128 + [\textit{program number}]$$

So for example, if you want to send to a MIDI Program Change message for **Program 83** in **MIDI Bank 4**, you would enter the number **595**—this number is equal to 4 * 128 + 83.

Demo Function

Pressing the Sound Select **E** and **F** buttons simultaneously performs the Demo Function.
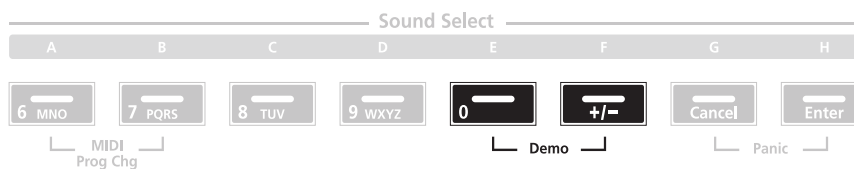
Entering this mode, the SP4 will play a built-in demo sequence designed to demonstrate the capabilities of the instrument. While the demo sequence plays, the display will show the text "Demo Mode," and the Sound Select **E** and Sound Select **F** button LEDs will blink, indicating that the instrument is in Demo Mode. Pressing any button will return to the previous mode.

Chapter 6
Program Mode

This chapter will help you familiarize yourself with the features of Program mode.

Programs are essentially the different sounds of a MIDI instrument—they are preset sound Objects equivalent to the "patches," "presets," or "voices" that you find on other synths. On the SP4, you can have up to 192 different Programs organized in three different Banks: Bank 1 (Programs **0**-**63**) and Bank 2 (programs **64**-**127**) provide you with 128 ready-to-play factory Programs, and the User Bank provides you with 64 slots for user-created Programs.

About Program Mode

Program mode is the default mode of the SP4—the SP4 starts up in this mode. To enter Program mode from another mode, press the **Program** Function button. While you are in Program mode, the **Program** button's indicator LED is illuminated. Also by default, the SP4 starts up with Program **0 Grand Piano** selected. If you enter Program mode from another mode, the last selected Program will be the current Program.
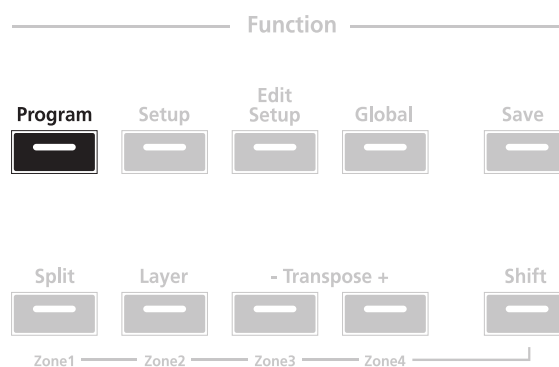
Table of Programs

ID	Name	Group	Sound
		BANK 1	
0	Standard Grand	Piano	A
1	Studio Grand		B
2	Horowitz Grand		C
3	Piano & Pad		D
4	Blues Piano'74		E
5	Rock Piano '74		F
6	Upright Piano		G
7	Piano & String		H
8	Duke's Rhds	E. Piano	A
9	Hotrod Rhds		B
10	Classic Wurly		C
11	Super Wurly		D
12	Fuzz Wurly		E
13	FM E Piano		F
14	Rich EP+Pad		G
15	UK Pop CP70		H
16	Wah Clav	Clav	A
17	Joe's Clav		B
18	BlackCow Clav		C
19	Stevie Fuzz		D
20	Orch Harp		E
21	Harpsichord		F
22	Celeste		G
23	Celeste/Glk		H
24	The Ninth Bar	Organ	A
25	Gregg's B		B
26	Ole Gospel B		C
27	Prog B3 Perc		D
28	Sly's Revenge		E
29	Farfisa		F
30	All Stops		G
31	Pipe Stops		H
32	LA Strings	String	A
33	Lead Strings		B
34	Pizzicato		C
35	Adagio Strngs		D
36	Tremolando		E
37	Tron Strings		F
38	Solo Violin		G
39	Solo Cello		H
40	Classic Comp	Synth	A
41	ARP2500 Brass		B
42	Mono Trekkies		C
43	OBX Jump!		D
44	80's Synth		E
45	Synth Bell		F
46	Synth Orch		G
47	SickoSynco		H
48	Full Choir	Voice	A
49	Cathedral Vox		B
50	Aaahlicious		C
51	Jazzy Ballad		D
52	Manhattan Vox		E
53	BrightSyn Vox		F
54	Tron Choir		G
55	Ahh Chorus		H

ID	Name	Group	Sound
56	Slo QuadraPad	Pad	A
57	BladerunnrARP		B
58	Slo Syn Orch		C
59	SynOrcWhale		D
60	So Lush Pad		E
61	Add a Pad 1		F
62	Add a Pad 2		G
63	Heaven&Earth		H
		BANK 2	
64	Solid Kit	Drum	A
65	Electric Kit		B
66	Gated Kit		C
67	HeadhuntersKt		D
68	Produced Kit		E
69	60'sRock&Soul		F
70	RocAFella Kit		G
71	MP Brush Kit		H
72	Natural Perc	Perc	A
73	Modern Perc		B
74	Timp&OrchPerc		C
75	Marimba		D
76	Vibes		E
77	Glockenspiel		F
78	Steel Drums		G
79	Xylophone		H
80	PowerPopHorns	Brass	A
81	SalsaSection		B
82	1-NotePwrRiff		C
83	P*Funk Horns		D
84	Solo Trumpet		E
85	Mute Trumpet		F
86	Brass Fanfare		G
87	Gothic Climax		H
88	Solo Flute	Wind	A
89	Lead Oboe		B
90	Solo Clarinet		C
91	Solo Bassoon		D
92	English Horn		E
93	Bari/TenorSec		F
94	Piccolo		G
95	Tron Flutes		H
96	Ac Guitar	Guitar	A
97	Real Nylon		B
98	Fluid Guitar		C
99	Comp'd Phaser		D
100	Emo Verser		E
101	Vox'd Elec12		F
102	Rock Lead MW		G
103	Rockin' Lead		H
104	E-Bass	Bass	A
105	Flea/Bootsy		B
106	Jaco Frtless		C
107	Upright Bass		D
108	Octave Frtls		E
109	BowhSaw Bass		F
110	KneeDeepMini		G
111	Big Dummy		H

ID	Name	Group	Sound		ID	Name	Group	Sound
112	Saw+Mogue 4P		A		120	BrazilAccord		A
113	Emerson Lead		B		121	MellowAccord		B
114	MicroMogue +		C		122	WindsHornStr		C
115	V Sync Lead	Lead	D		123	Strs&Silver	Misc	D
116	Toot Lead		E		124	China Flower		E
117	MWheel Lead		F		125	Blues Harp		F
118	12SAWLeadMW		G		126	Touch Koto		G
119	Square Lead		H		127	Magic Mbira		H

USER BANK

ID	Name	Group	Sound
128–191	*(User Programs)*	A–H	A–H

Selection

In Program mode, the display shows the current Program. Use the Value buttons below the display to change the current Program—pressing **Previous** will scroll down the list and pressing **Next** will scroll up the list. Pressing both **Next** and **Previous** simultaneously will jump to the first Program of the next Group.

The display and Value buttons below it are located close to the center of the front panel.
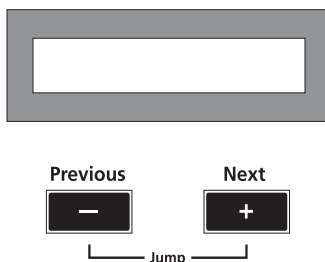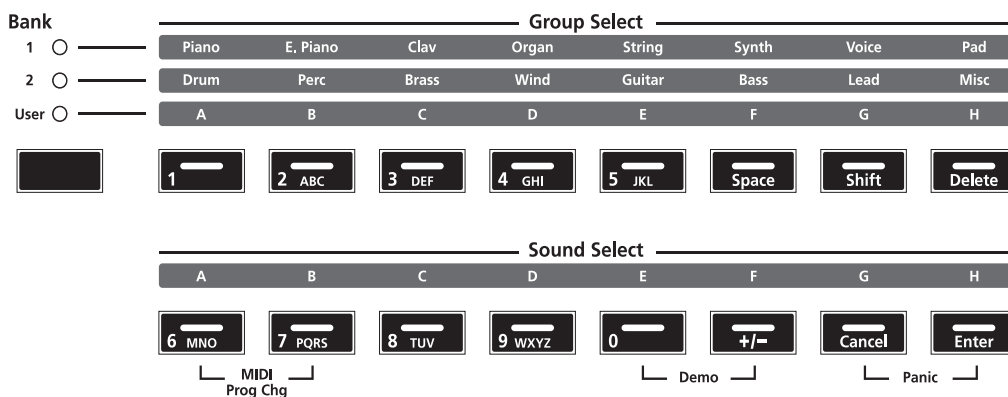
Using the Object Select Buttons

The Object Select Buttons are located on the right side of the front panel. Note that there are three types of Object Select Buttons: Bank Select, Group Select, and Sound Select. The Programs of the SP4 are organized in three levels of organization: eight Sounds make up a Group, eight Groups make up a Bank. The following figure illustrates this organization using the Program **42 Jump! 0bx** as an example:

For all objects, the currently selected Bank, Group, and Sound are indicated by a lit LED. The example above (**42 Jump! 0bx**) would appear as follows:
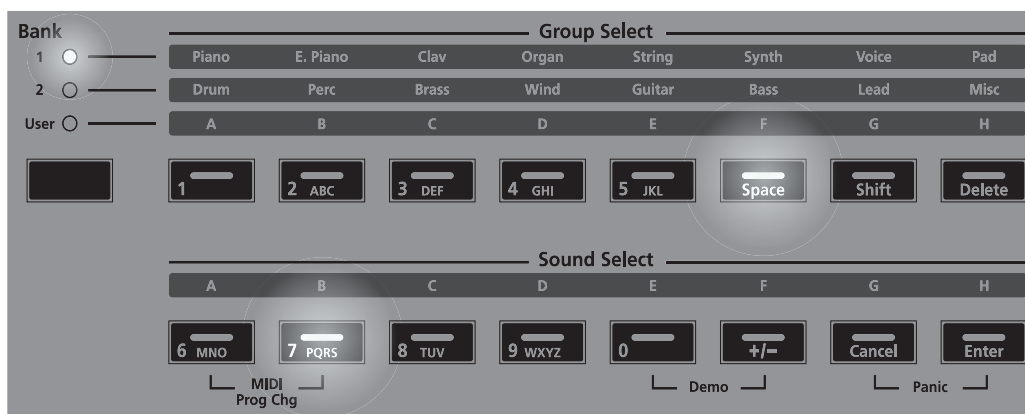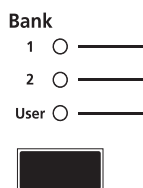
Bank Select Button

Pressing the **Bank Select** button will cycle through the three Object Banks: Bank 1, Bank 2, and User. The column of LEDs indicates the currently selected Bank. In Program Mode, Bank 1 contains programs 0-63, Bank 2 contains programs 64-127, and User Bank contains user-created programs numbered 128-191.

NOTE: A "Bank" is a SP4-specific term not to be confused with the general "MIDI Bank", which is contains 128 Objects. When transmitting MIDI Bank Change and MIDI Program Change messages, always think in terms of "MIDI Banks" rather than "Banks".

Group Select Buttons

As pictured below, there are eight **Group Select** buttons. Note that each button corresponds to a different Group depending on the currently selected Bank.

Each Bank is divided into eight Groups. Pressing the **Group Select** button immediately beneath each Group label will select that Group within the current Bank. The LED of the currently selected Group's button will be lit.

Sound Select Buttons

Each of the **Sound Select** buttons corresponds to one Sound in the currently selected Group; pressing one of these buttons will select that Sound. The LED of the currently selected Sound's button will be lit.

Alphanumeric Data Entry

When editing parameters or naming Objects, you can use the Group and Sound Select buttons for alphanumeric data entry. Note that on each button the secondary function is printed in white ink.

Transposition

Pressing the **Transpose +** button will transpose the current Program up by one semitone; pressing the **Transpose –** button will transpose the current Program down by one semitone. Pressing both **Transpose +** and **Transpose –** simultaneously will restore the current Program to having no transposition; if these two buttons are simultaneously pressed when there is already no transposition, then the current Program will be transposed down by one octave (12 semitones).

The LEDs of the Transposition buttons indicate whether the current Program is transposed up (when **Transpose +** is lit) or transposed down (when **Transpose –** is lit). When there is no transposition, then neither Transposition button is lit.

The Control Knob
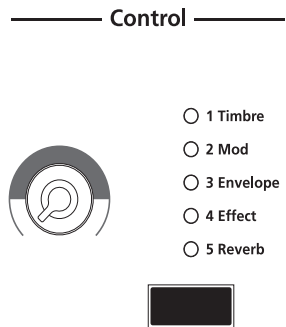
The control knob gives you real-time control of five different parameters—the currently selected parameter is indicated by the column of LEDs. By default these five parameters are:

- 1 Timbre
- 2 Mod
- 3 Envelope
- 4 Effect

> • 5 Reverb

You can change what these five parameters are in Edit Setup Mode (see *Edit Setup Mode on page 8-1*).

Pressing the **Control Select** button (located beneath the column of LEDs) changes the currently selected parameter that is affected by the control knob. Note that when you make a change to the current Program using the Control Knob, the **Save** button LED will light up indicating that a change has been made to the Program. For more information on the **Save** button and its LED states, see *Saving in Program Mode on page 6-10*.

The Split Function

Pressing the **Split** Function button while in Program mode will perform the Split Function. The Split Function allows you to split Programs such that keys in one region of the keyboard produce different sounds than another region.
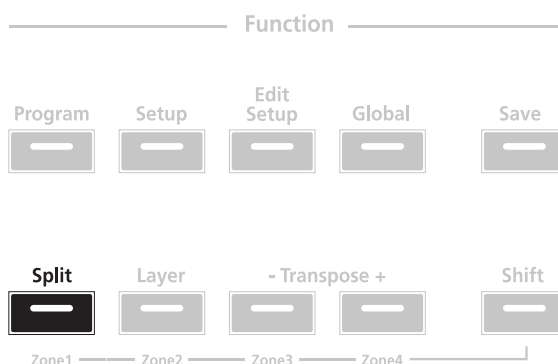
When you create a Split in a Program, you are in fact creating a Setup (see *Setup Mode on page 7-1* for more information on Setups). As previously described, Setups are configurations of four Zones, each of which may have its own Program and controller assignments. Once you've created a Split in a Program, creating another Split will activate another Zone within what is now a Setup. If the Setup already has its maximum of four active Zones and you press the **Split** Function button, then a message will appear on the display indicating that you have reached the maximum of four active Zones. The Split Function is convenient, as you do not need to go through Edit Setup Mode to delineate Zones, assign Programs, etc. You can simply hit the **Split** Function button, and the SP4 automatically activates another Zone in the Setup for you, with default values for parameters of the Split.

The newly-activated Zone is the "Secondary Voice". The currently active Zone(s) constitute the "Primary Voice".

There are four parameters (described below) that determine the behavior of the Split. You can view these parameters by scrolling through them using the **Chan / Param** buttons. To edit them, use the Value buttons or the secondary alphanumeric entry functions of the Object select buttons.

Split Program

This parameter determines the Program for the Secondary Voice (left-hand side) of the Split—the current Program is the Program for the Primary Zone (right-hand side) of the Split, and is also the default Split Program. Any of the Programs can be chosen for this parameter.

Split Volume

This parameter determines the relative volumes of the Secondary and Primary Voices—it can be set to any number between **-127** and **127**. By default, the Split Volume is set to **0**, which results in both Voices having the same volume. When set to a positive number, the volume for the Secondary Voice is increased while the volume for the Primary Voice is decreased—doing the opposite has the opposite effect on the relative volumes of the Voice.

Split Key

This parameter determines the boundary of the Split—it can be set to any number between **20** (G#0) and **108** (C8). By default, the Split Key is set to **60** (C4, or middle C). The chosen key is the highest note in the Secondary Voice—one note above this note is the lowest note in the Primary Voice. In addition to using the Value buttons, you can directly select the Split Key by holding down the Sound Select **H** (aka **Enter**) button and then striking the desired key on the keyboard.

Split Transposition

This parameter determines the transposition of the Secondary Voice relative to that of the Primary Voice—it can be set to **-24**, **-12**, **0**, **12**, and **24**. By default, Split Transposition is set to **0**. Note that if the Primary Voice is transposed, then the Secondary Voice will be transposed by the same amount in addition to being transposed by the amount set for the Split Transposition.

The Layer Function

Pressing the **Layer** Function button while in Program mode will perform the Layer Function. The Layer Function allows you to layer programs and setups such that more than one sound can be produced by striking one key.

When you create a Layer in a Program, you are in fact creating a Setup (see *Setup Mode on page 7-1* for more information on Setups). As previously described, Setups are configurations of up to four Zones, each of which may have its own Program and controller assignments. Once you've created a Layer in a Program, creating another Layer will create activate another Zone within what is now a Setup. If the current Setup already has its maximum of four active Zones and you press the **Layer** Function button, then a message will appear on the display indicating that you have reached the maximum of four active Zones. The Layer Function is convenient, as you do not need to go through Edit Setup Mode to delineate Zones, assign Programs, etc. You can simply hit the **Layer** Function button, and the SP4 automatically activates another Zone in the Setup for you, with default values for parameters of the Layer.

There are three parameters (described below) that determine the behavior of the Layer. You can view these parameters by scrolling through them using the **Chan / Param** buttons. To edit them, use the Value buttons or the secondary alphanumeric entry functions of the Object select buttons.

Layer Program

This parameter determines the program for the Secondary Voice—the current program is the program for the Primary Voice. Any of the programs can be chosen for this parameter.

Layer Volume

This parameter determines the relative volumes of the Secondary and Primary Voices—it can be set to any number between **-127** and **127**. By default, the Layer Volume is set to **0**, which results in both Voices having the same volume. When set to a positive number, the volume for the Secondary Voice is increased while the volume for the Primary Layer is decreased—doing the opposite has the opposite effect on the relative volumes of the Layers.

Layer Transposition

This parameter determines the transposition of the Secondary Voice relative to that of the Primary Voice—it can be set to **-24**, **-12**, **0**, **12**, and **24**. By default, Layer Transposition is set to **0**. Note that if the Primary Voice is transposed, then the Secondary Voice will be transposed by the same amount in addition to being transposed by the amount set for the Layer Transposition.

Changing the Transmit MIDI Channel

Pressing the **Chan / Param Up (⌃)** or **Down (⌄)** button will change the MIDI transmit channel, incrementing or decrementing it respectively. Pressing both **Chan / Param Up (⌃)** and **Down (⌄)** at the same time will reset the current MIDI channel to **1**.

The MIDI channel will be shown briefly in the display before the display changes back to showing the current Program on the selected MIDI transmit channel.

Saving in Program Mode
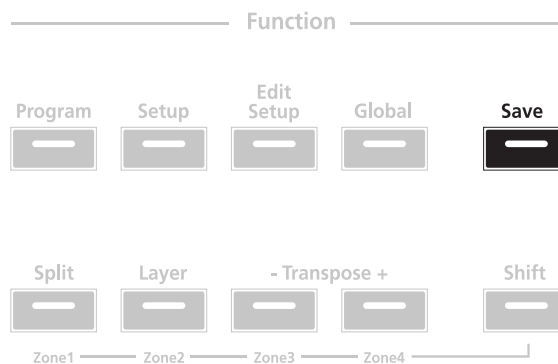
When you make a change to the current Program using the Control Knob, the **Save** button LED will light up indicating that a change has been made to the Program. To save the current Program, press the **Save** button once. The **Save** button LED will blink to indicate that a save operation is underway, and the User Bank LED will also be lit. If the program is an edited Factory Program (i.e., a Program in Bank 1 or Bank 2), the default save location will be the next available location in the User Bank. If all 64 User Bank slots are taken, then

the Program is saved in the last slot in the User Bank, overwriting what was previously in that slot. If the current Program is a Program already in the User Bank, then the Program is saved in its current Program slot. At this point, you can rename the new Program using the secondary alphanumeric functions of the Group Select and Sound Select buttons.

When the **Save** button LED is blinking (which means that you pressed Save, and a save operation is underway), pressing **Save** again will cause the system to save the current Program to the indicated Group and Sound in the User Bank. If you want to save it to a different location in the User Bank, select the location via the Group Select and Sound Select buttons (or using the Value buttons) before pressing **Save** again.

Pressing any other button while the **Save** button is blinking will cancel the save operation.

Saving in Program Mode

Chapter 7
Setup Mode

This chapter will help you familiarize yourself with the features of Setup mode.

Setups are configurations of four Zones (explained below in About Zones), each of which may have its own Program, controller assignments, and MIDI transmit channel. You can have up to 128 different Setups organized in two different banks: Bank 1 (Setups **0**-**63**) and User Bank (Setups **64**-**127**). These provide you respectively with 64 ready-to-play factory Setups and 64 slots for user-created Setups.

About Setup Mode

To enter Setup mode from another mode, press the **Setup** Function button. While you are in Setup mode, the **Setup** button's indicator LED is illuminated. By default, when you enter Setup mode after a start-up of your instrument, Setup **0** will be the current Setup. If you enter Setup mode from another mode, the last selected Setup will be the current Setup.
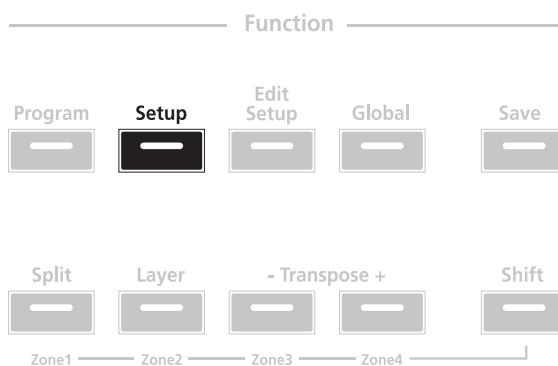
Table of Setups

BANK 1

ID	Name	Group	Sound		ID	Name	Group	Sound
0	BritePno/Slap		A		32	Comper2/SynBs		A
1	BritePno/Jaco		B		33	Vibes/UpBass		B
2	JazzPno/UpBs		C		34	Mbira/GlkHarp		C
3	PadPno/Levin	A	D		35	Steel/Marimba	E	D
4	PnoStrng/UpBs		E		36	CagePerc/Glck		E
5	Rhodes/E-Bs		F		37	Mbira/NatPerc		F
6	S Tramp/E-Bs		G		38	Magic/CagePerc		G
7	FM EP/E-Bs		H		39	Silver/GlockHarp		H
8	CP70/Levin		A		40	WindsStr/Mini		A
9	Clav/Slap		B		41	Luscious EP		B
10	PhzClav/E-Bs		C		42	Luscious EP2		C
11	GregKB/E-Bs		D		43	Swank CP70	F	D
12	ProgKB/UpBs	B	E		44	Sndtrack Xylo		E
13	SlyKB/SlpBs		F		45	Rich Stack		F
14	Church1/Strgs		G		46	Harp/Marimba		G
15	Church2/Strgs		H		47	Pizz Marimba		H
16	Horns/SynBs		A		48	Big Dance Syn		A
17	Horns/SlapBs		B		49	Sparkle Harp		B
18	Orc/SynBs1		C		50	Plucked Ivory		C
19	Orc/SynBs2		D		51	Intense SynLd	G	D
20	LushPad/Bs	C	E		52	Intense Comp		E
21	Strngs/E Bs		F		53	Rich Voices		F
22	Voices1/SynBs		G		54	VIP Accordian		G
23	Voices2/SynBs		H		55	Fantasy Koto		H
24	Voices3/UpBs		A		56	VIP Square Ld		A
25	Voices3/E-Bs		B		57	VIP Mooger Ld		B
26	Voices4/SynBs		C		58	VIP Sync Lead		C
27	A Guit/E Bs		D		59	VIP KE Lead	H	D
28	Fluid/Upright	D	E		60	VIP ED Lead		E
29	E Guit3/E-Bs		F		61	VIP GH Lead		F
30	Q Pad/Levin		G		62	Clear Setup		G
31	Heaven/SynBs		H		63	Default Setup		H
					126	Internal Voices	H	G

USER BANK

ID	Name	Group	Sound
128–191	*(User Programs)*	A–H	A–H

Selection

In Setup mode, the display shows the current Setup. Use the Value buttons below the display to change the current Setup—pressing **Previous** will scroll down the list and pressing **Next** will scroll up the list. Pressing both **Next** and **Previous** simultaneously will jump to the first Setup of the next Group.

The display and Value buttons below it are located close to the center of the front panel.
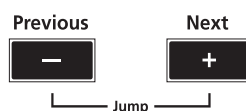
Using the Object Select Buttons
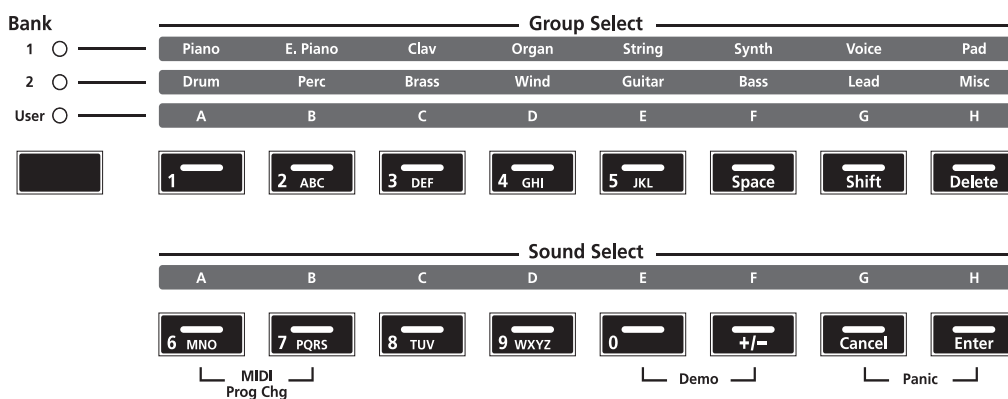
The Object Select Buttons are located on the right side of the front panel. Note that there are three types of Object Select Buttons: Bank Select, Group Select, and Sound Select. The Setups of the SP4 are organized in three levels of organization: eight Sounds make up a Group, eight Groups make up a Bank. The following figure illustrates this organization using the Setup **19** as an example:
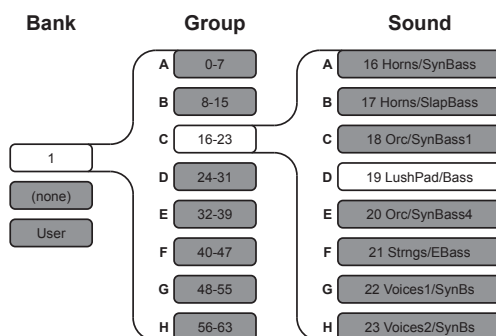
For all objects, the currently selected Bank, Group, and Sound are indicated by a lit LED. The example above (Setup **19**) would appear as follows:
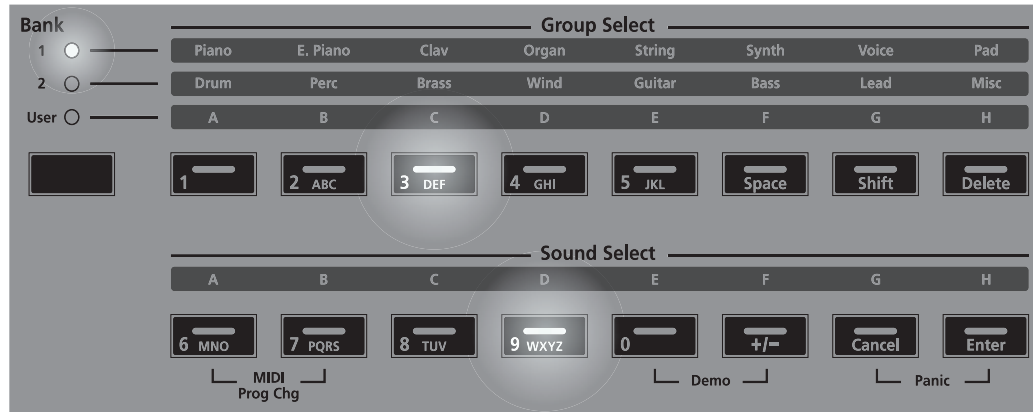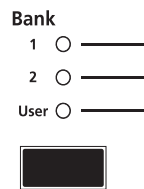
Bank Select Button

Pressing the **Bank Select** button will cycle through the three Object Banks: Bank 1, Bank 2, and User. The column of LEDs indicates the currently selected Bank. In Setup Mode, Bank 1 contains Setups 0-63 and User Bank contains user-created programs numbered 64-127.

NOTE: A "Bank" is a SP4-specific term not to be confused with the general "MIDI Bank", which is contains 128 Objects. When transmitting MIDI Bank Change and MIDI Program Change messages, always think in terms of "MIDI Banks" rather than "Banks".

Group Select Buttons

As pictured below, there are eight **Group Select** buttons. Note that each button corresponds to a different Group depending on the currently selected bank.

Each bank is divided into eight Groups. Pressing the **Group Select** button immediately beneath each Group label will select that Group within the current bank. The LED of the currently selected Group's button will be lit.

Sound Select Buttons

Each of the **Sound Select** buttons corresponds to one Sound in the currently selected Group; pressing one of these buttons will select that Sound. The LED of the currently selected Sound's button will be lit.

Alphanumeric Data Entry

When editing parameters or naming Objects, you can use the Group and Sound Select buttons for alphanumeric data entry. Note that on each button the secondary function is printed in white ink.

About Zones

Zones are the independent regions of the keyboard that make up a Setup. A Setup has four Zones, each one having its own Program, controller assignments, and MIDI transmit channel. Zones can be mutually exclusive regions of the keyboard, or they can overlap. You cannot, however, have "blank" regions of the keyboard that do not belong to a Zone—you can achieve this effect by muting Zones.

Muting Zones

You can use the secondary functions of the **Split**, **Layer**, and both **Transposition** buttons to mute (and unmute) Zones of the current Setup. To do so, press and hold down the **Shift** button. When you hold down the **Shift** button, the Zone buttons of unmuted Zones illuminate—pressing one of these unmuted Zone buttons will mute its Zone and its indicator LED will turn off. If a Zone is already muted, then, when holding down the Shift button, its Zone button LED will flash on and off—pressing one of these muted Zone buttons will unmute its Zone and its indicator LED will illuminate.

For example, consider a Setup with Zones 1, 2, and 4 active and Zone 3 muted. While pressing down the **Shift** button, the Zone buttons will appear as follows:

Transposition

Pressing the **Transpose +** button will transpose the current Program up by one semitone; pressing the **Transpose –** button will transpose the current Program down by one semitone. Pressing both **Transpose +** and **Transpose –** simultaneously will restore the current Program to having no transposition; if these two buttons are simultaneously pressed when there is already no transposition, then the current Program will be transposed down by one octave (12 semitones).

The LEDs of the Transposition buttons indicate whether the current Program is transposed up (when **Transpose +** is lit) or transposed down (when **Transpose –** is lit). When there is no transposition, then neither Transposition button is lit.

Note that the Setup transposition is relative to each Zone's preset transposition. For instance, if a Zone has a **+2** semitone transposition and the Setup has a **+4** semitone transposition, then that Zone will have a **+6** semitone transposition.

The Control Knob

Control

○ 1 Timbre

○ 2 Mod

○ 3 Envelope

○ 4 Effect

○ 5 Reverb

The control knob gives you real-time control of five different parameters—the currently selected parameter is indicated by the column of LEDs. By default these five parameters are:

- 1 Timbre
- 2 Mod
- 3 Envelope
- 4 Effect
- 5 Reverb

You can change what these five parameters are in Edit Setup Mode (see *Edit Setup Mode on page 8-1*).

Pressing the **Control Select** button (located beneath the column of LEDs) changes the currently selected parameter that is affected by the control knob. Note that when you make a change to the current Setup using the Control Knob, the **Save** button LED will light up indicating that a change has been made to the Setup. For more information on the **Save** button and its LED states, see the section *Saving in Setup Mode on page 7-11* below.

Each Zone of the Setup may have its own unique Control Knob parameters—you can change what these five parameters are in Edit Setup Mode (see *Edit Setup Mode on page 8-1*). Note that when you make a change to the current Setup by turning the Control Knob, the **Save** button LED will light up indicating that a change has been made to the Setup. For more information on the **Save** button and its LED states, see *Saving in Setup Mode on page 7-11*.

The Split Function

Pressing the **Split** Function button while in Setup mode will perform the Split Function.
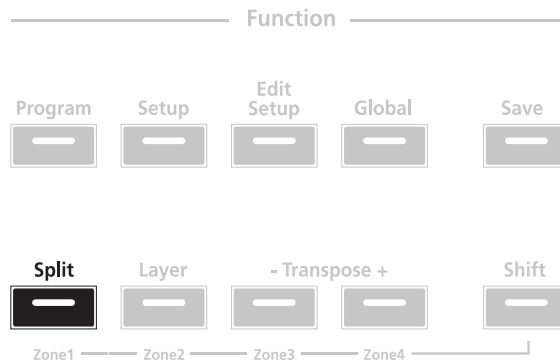
When you create a Split in a Setup, you are in fact activating a Zone within the current Setup. If the current Setup already has its maximum of four active Zones and you press the **Split** Function button, then a message will appear on the display indicating that you have reached the maximum of four active Zones. The Split Function is convenient, as you do not need to go through Edit Setup Mode to delineate Zones, assign Programs, etc. You can simply hit the **Split** Function button, and the SP4 automatically activates another Zone in the Setup for you, with default values for parameters of the Split.

The newly-activated Zone is the "Secondary Voice". The currently active Zone(s) constitute the "Primary Voice".

There are four parameters (described below) that determine the behavior of the Split. You can view these parameters by scrolling through them using the **Chan / Param** buttons. To edit them, use the Value buttons or the secondary alphanumeric entry functions of the Object select buttons.

Split Program

This parameter determines the Program for the Secondary Voice. Any of the Programs can be chosen for this parameter.

Split Volume

This parameter determines the relative volumes of the Secondary and Primary Voices—it can be set to any number between **-127** and **127**. By default, the Split Volume is set to **0**, which results in both Voices having the same volume. When set to a positive number, the volume for the Secondary Voice is increased while the volume for the Primary Voice is decreased—doing the opposite has the opposite effect on the relative volumes of the Voices.

Split Key

This parameter determines the boundary of the Split—it can be set to any number between **20** (G#0) and **108** (C8). By default, the Split Key is set to **60** (C4, or middle C). The chosen key is the highest note in the Secondary Voice—one note above this note is the lowest note in the Primary Voice. In addition to using the Value buttons, you can directly select the Split Key by holding down the Sound Select **H** (aka **Enter**) button and then striking the desired key on the keyboard.

Split Transposition

This parameter determines the transposition of the Secondary Voice relative to that of the Primary Voice—it can be set to **-24**, **-12**, **0**, **12**, and **24**. By default, Split Transposition is set to **0**. Note that if the Primary Voice is transposed, then the Secondary Voice will be transposed by the same amount in addition to being transposed by the amount set for the Split Transposition.

The Layer Function

Pressing the **Layer** Function button while in Setup mode will perform the Layer Function.

When you create a Layer in a Setup, you are in fact activating a Zone within the current Setup. If the current Setup already has its maximum of four active Zones and you press the **Layer** Function button, then a message will appear on the display indicating that you have reached the maximum of four active Zones. The Layer Function is convenient, as you do not need to go through Edit Setup Mode to delineate Zones, assign Programs, etc. You can simply hit the **Layer** Function button, and the SP4 automatically activates another Zone in the Setup for you, with default values for parameters of the Layer.

The newly-activated Zone is the "Secondary Voice". The currently active Zone(s) constitute the "Primary Voice".

There are three parameters (described below) that determine the behavior of the Layer. You can view these parameters by scrolling through them using the **Chan / Param** buttons. To edit them, use the Value buttons or the secondary alphanumeric entry functions of the Object select buttons.

Layer Program

This parameter determines the program for the Secondary Voice. Any of the Programs can be chosen for this parameter.

Layer Volume

This parameter determines the relative volumes of the Secondary and Primary Voices—it can be set to any number between **-127** and **127**. By default, the Layer Volume is set to **0**, which results in both Voices having the same volume. When set to a positive number, the volume for the Secondary Voice is increased while the volume for the Primary Voice is decreased—doing the opposite has the opposite effect on the relative volumes of the Voices.

Layer Transposition

This parameter determines the transposition of the Secondary Voice relative to that of the Primary Voice—it can be set to **-24**, **-12**, **0**, **12**, and **24**. By default, Layer Transposition is set to **0**. Note that if the Primary Voice is transposed, then the Secondary Voice will be transposed by the same amount in addition to being transposed by the amount set for the Layer Transposition.

Changing the Transmit MIDI Channel

Pressing the **Chan / Param Up (∧)** or **Down (∨)** button will change the MIDI transmit channel, incrementing or decrementing it respectively. Pressing both **Chan / Param Up (∧)** and **Down (∨)** at the same time will reset the current MIDI channel to **1**.

```
      ┌──────┐
      │  ⌄   │
      └──────┘
         |
       Chan/
       Param
         |
      ┌──────┐
      │  ⌄   │
      └──────┘
```

The MIDI channel will be shown briefly in the display before the display changes back to showing the current Program on the selected MIDI transmit channel.

Saving in Setup Mode

When you make a change to the current Setup using the Control Knob, the **Save** button LED will light up indicating that a change has been made to the Setup. To save the current Setup, press the **Save** button once. The **Save** button LED will blink to indicate that a save operation is underway, and the User Bank LED will also be lit. If the Setup is an edited Factory Setup (i.e., a Setup in Bank 1), the default save location will be the next available location in the User Bank. If all 64 User Bank slots are taken, then the Setup is saved in the last slot in the User Bank, overwriting what was previously in that slot. If the current Setup is a Setup already in the User Bank, then the Setup is saved in its current Setup slot. At this point, you can rename the new Setup using the secondary alphanumeric functions of the Group Select and Sound Select buttons.

When the **Save** button LED is blinking (which means that you pressed Save, and a save operation is underway), pressing **Save** again will cause the system to save the current Setup to the indicated Group and Sound in the User Bank. If you want to save it to a different location in the User Bank, select the location via the Group Select and Sound Select buttons (or using the Value buttons) before pressing **Save** again.

Pressing any other button while the **Save** button is blinking will cancel the save operation.

Chapter 8
Edit Setup Mode

This chapter will help you familiarize yourself with the features of Edit Setup Mode

About Edit Setup Mode

NOTE: Before you read this chapter, be sure to read *Setup Mode on page 7-1* for a full description of Setups.

Edit Setup mode allows you to edit and create Setups—it gives you access to a Setup's common parameters and Zone-specific parameters. In this mode, you can customize the Program, controller assignments, and MIDI transmit channel (in addition to many other parameters) of the Zones in a Setup. Any Setup edited or created in Edit Setup mode is saved to one of the 64 User Bank slots.

To enter Edit Setup mode from another mode, press the **Edit Setup** Function button. While you are in Edit Setup mode, the **Edit Setup** button's indicator LED is illuminated.
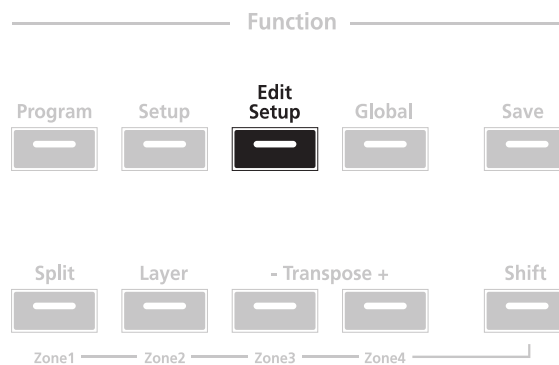
The Parameters of a Setup

A Setup has 43 Zone-specific parameters for each of four Zones, and two common parameters—altogether, there are 174 parameters whose configurations determine the behavior of the Setup. As you scroll through the list of parameters using the **Chan / Param Up (∧)** button, the parameters appear in the following order (the parameters of course appear in the reverse order if you scroll through the list with **Chan / Param Down (∨)** button):

43	43	43	43	2
Zone 1 Parameters	Zone 2 Parameters	Zone 3 Parameters	Zone 4 Parameters	Common Parameters

List No. Z. 1	Z. 2	Z. 3	Z. 4	Parameter	Range of Values	Default Value
1	44	87	130	Local Program	Program List	0 Grand Piano
2	45	88	131	Channel	1 to 16	1
3	46	89	132	Destination	Local, MIDI, Local+MIDI	Local+MIDI
4	47	90	133	MIDI Bank	0 to 127	Bank of Local Program
5	48	91	134	MIDI Program	0 to 127	Program Number of Local Program
6	49	92	135	Bank Mode	None, Ctl0, Ctl32, Ctl0/32, K2600	Ctl0/32
7	50	93	136	Zone Status	Active, Muted	Active
8	51	94	137	Entry Program Change	Off, On	On
9	52	95	138	Aux Send Level	0 to 127	20
10	53	96	139	Transpose	-128 to 127 ST	0
11	54	97	140	Entry Pan	0 to 127	64
12	55	98	141	Entry Volume	0 to 127	127
13	56	99	142	Low Velocity	1 to 127	1
14	57	100	143	High Velocity	0 to 127	127
15	58	101	144	Low Key	C-1 to G9	(none)
16	59	102	145	High Key	C-1 to G9	(none)
17	60	103	146	Bend Range Down	0 to 127 ST	12 ST
18	61	104	147	Rend Range Up	0 to 127 ST	12 ST
19	62	105	148	Mod Wheel Destination	MIDI Destination List	(none)
20	63	106	149	Mod Wheel Entry Value	0 to 127	(none)
21	64	107	150	Mod Wheel Exit Value	0 to 127	(none)
22	65	108	151	Control Knob Function 1 Destination	MIDI Destination List	(none)
23	66	109	152	Control Knob Function 1 Entry Value	0 to 127	(none)
24	67	110	153	Control Knob Function 1 Exit Value	0 to 127	(none)
25	68	111	154	Control Knob Function 2 Destination	MIDI Destination List	(none)
26	69	112	155	Control Knob Function 2 Entry Value	0 to 127	(none)
27	70	113	156	Control Knob Function 2 Exit Value	0 to 127	(none)

List No.				Parameter	Range of Values	Default Value
Z. 1	Z. 2	Z. 3	Z. 4			
28	71	114	157	Control Knob Function 3 Destination	MIDI Destination List	(none)
29	72	115	158	Control Knob Function 3 Entry Value	0 to 127	(none)
30	73	116	159	Control Knob Function 3 Exit Value	0 to 127	(none)
31	74	117	160	Control Knob Function 4 Destination	MIDI Destination List	(none)
32	75	118	161	Control Knob Function 4 Entry Value	0 to 127	(none)
33	76	119	162	Control Knob Function 4 Exit Value	0 to 127	(none)
34	77	120	163	Control Knob Function 5 Destination	MIDI Destination List	(none)
35	78	121	164	Control Knob Function 5 Entry Value	0 to 127	(none)
36	79	122	165	Control Knob Function 5 Exit Value	0 to 127	(none)
37	80	123	166	CC Pedal Destination	MIDI Destination List	(none)
38	81	124	167	CC Pedal Entry Value	0 to 127	(none)
39	82	125	168	CC Pedal Exit Value	0 to 127	(none)
40	83	126	169	Foot Switch Destination	MIDI Destination List	(none)
41	84	127	170	Foot Switch Mode	Momentary, Toggled	Toggled
42	85	128	171	Foot Switch Entry State	None, On, Off	None
43	86	129	172	Foot Switch Exit State	None, On, Off	None
173				Aux Effect Override	Prog, 0 to 999	Prog
174				Aux Effect Channel	(Channels used in Setup)	(Channel of Zone 1)

Note the state of the indicator LEDs in the Zone buttons. If you are currently editing a Zone-specific parameter, then the LED of that Zone button will be illuminated. If you are currently editing a common parameter, then the LEDs of all four Zone buttons will be lit.

Zone 1 Parameter Selected
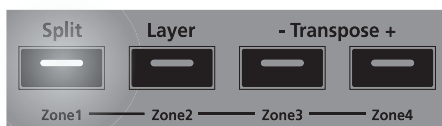
Zone 2 Parameter Selected
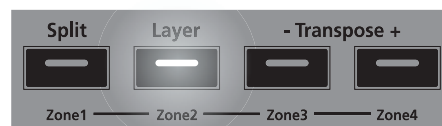
Zone 3 Parameter Selected
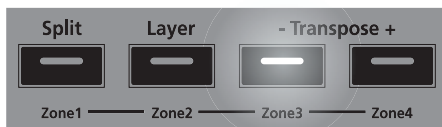
Zone 4 Parameter Selected
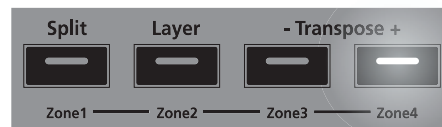
Common Parameter Selected
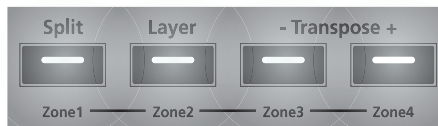
To edit the currently selected parameter, simply use the **Next** and **Previous** Value buttons below the display. Pressing both Value buttons simultaneously will jump to a different value depending on the parameter—the jump value is mentioned in each of the parameter descriptions below. Additionally, you can use the secondary numeric functions of the Group Select and Sound Select buttons.

The Zone-specific Parameters

Each of the four Zones in Setup has 43 parameters that determine its behavior. Since the Zones of a Setup are independent of each other, changing a parameter for a certain Zone will not affect the parameters of any other Zone.

Local Program

The Local Program parameter determines the Program to be loaded for the currently selected Zone. You can set this parameter to any of the 192 Programs (**0-191**). Note that the display shows only the Program number but not the name. Pressing both Value buttons simultaneously will set this parameter to **0** (**0 Grand Piano**)

Editing this parameter also changes the MIDI Bank and MIDI Program parameters, described below.

Channel

The Channel parameter determines the MIDI transmit channel for the currently selected Zone. You can set this parameter to any of the 16 MIDI channels (**1-16**). Pressing both Value buttons simultaneously will set this parameter to **1**.

Destination

The Destination parameter determines whether MIDI data generated by the currently selected Zone is sent to the SP4 sound engine, through the MIDI OUT port, or both. You can set this parameter to any of the three destinations for this parameter:

Local	MIDI data is sent only to the SP4 sound engine. The MIDI OUT port is disabled.
MIDI	MIDI data is sent only through the MIDI OUT port. The sounds of the current Zone are disabled.
Local+MIDI	MIDI data is sent both to the SP4 sound engine and through the MIDI OUT port.

Select the desired destination depending on your needs. If you want to play the SP4, but

not send any MIDI information to other MIDI instruments, then select Local. If you want to use the SP4 strictly as a MIDI controller for the other modules in your MIDI chain, then select MIDI. If you want to make use of the SP4's sounds as well as use it as a MIDI controller, then select **Local+MIDI**.

Pressing both Value buttons simultaneously will set this parameter to **Local+MIDI**.

MIDI Bank

The MIDI Bank parameter determines the MIDI Bank change message that the currently selected Zone sends when the Setup is loaded. You can set this parameter to a MIDI Bank change message from **0** to **127**.

When using the SP4 as a MIDI controller, sending a MIDI Bank change message (along with a MIDI program change message) when a Setup is loaded ensures that the Program loaded on the other sound modules in your MIDI chain is the Program that you want. For example, if you've configured a Setup to work in a specific way with Program **32** in Bank **5** of a connected sound module, then set MIDI Bank to **5** and MIDI Program to **32**. This way, whenever you load this Setup, the sound module will automatically load Program **32** in Bank **5**.

Pressing both Value buttons simultaneously will set this parameter to the Bank number of the currently select Local Program.

NOTE: When you change the Local Program parameter, the MIDI Bank and MIDI Program parameters will automatically change to match the Bank and Program numbers of the Program that you select for Local Program. For example, if you choose Program **178**, then MIDI Bank will change to **1** and MIDI Program will change to **50**.

NOTE: A "Bank" is a SP4-specific term not to be confused with the general "MIDI Bank", which is contains 128 Objects. When transmitting MIDI Bank Change and MIDI Program Change messages, always think in terms of "MIDI Banks" rather than "Banks".

Differing Program Numbers

If the programs on your connected sound module are organized by MIDI Bank with each program number being between **0** and **127**, then use the following formula to determine what number to enter for the MIDI Program Change Function:

$$[MIDI\ Bank\ number] * 128 + [program\ number] - 1$$

So for example, if you want to send to a MIDI Program Change message for **Program 83** in **MIDI Bank 4**, you would enter the number **594**—this number is equal to 4 * 128 + 83 - 1.

If the programs on your connected sound module are organized by MIDI Bank with each program number being between **1** and **128**, then use the following formula to determine what number to enter in MIDI Program Change mode:

$$[MIDI\ Bank\ number] * 128 + [program\ number]$$

So for example, if you want to send to a MIDI Program Change message for **Program 83** in **MIDI Bank 4**, you would enter the number **595**—this number is equal to 4 * 128 + 83.

MIDI Program

The MIDI Program parameter determines the MIDI Program change message that the currently selected Zone sends when the Setup is loaded. You can set this parameter to a MIDI Program change message from **0** to **127**.

When using the SP4 as a MIDI controller, sending a MIDI program change message (along with a MIDI bank change message) when a Setup is loaded ensures that the Program loaded on the other sound modules in your MIDI chain is the Program that you want. For example, if you've configured a Setup to work in a specific way with Program **32** in Bank **5** of a connected sound module, then set MIDI Bank to **5** and MIDI Program to **32**. This way, whenever you load this Setup, the sound module will automatically load Program **32** in Bank 5.

Pressing both Value buttons simultaneously will set this parameter to the Program number of the currently select Local Program.

NOTE: When you change the Local Program parameter, the MIDI Bank and MIDI Program parameters will automatically change to match the Bank and Program numbers of the Program that you select for Local Program. For example, if you choose Program **178**, then MIDI Bank will change to **1** and MIDI Program will change to **50**.

NOTE: A "Bank" is a SP4-specific term not to be confused with the general "MIDI Bank", which is contains 128 Objects. When transmitting MIDI Bank Change and MIDI Program Change messages, always think in terms of "MIDI Banks" rather than "Banks".

Differing Program Numbers

If the programs on your connected sound module are organized by MIDI Bank with each program number being between **0** and **127**, then use the following formula to determine what number to enter for the MIDI Program Change Function:

$$[MIDI\ Bank\ number] * 128 + [program\ number] - 1$$

So for example, if you want to send to a MIDI Program Change message for **Program 83** in **MIDI Bank 4**, you would enter the number **594**—this number is equal to 4 * 128 + 83 - 1.

If the programs on your connected sound module are organized by MIDI Bank with each program number being between **1** and **128**, then use the following formula to determine what number to enter in MIDI Program Change mode:

$$[\textit{MIDI Bank number}] * 128 + [\textit{program number}]$$

So for example, if you want to send to a MIDI Program Change message for **Program 83** in **MIDI Bank 4**, you would enter the number **595**—this number is equal to 4 * 128 + 83.

Bank Mode

The Bank Mode parameter determines the controller number with which MIDI Bank change messages are transmitted. For MIDI Bank change messages, various manufacturers have chosen different MIDI controller numbers. Most have chosen 0, 32, or both. In the case of the Kurzweil K2600, it has its own unique controller number that it responds to.

You can set this parameter to any of the five controller IDs:

None	MIDI Bank change messages are disabled.
Ctl0	MIDI Bank change messages are sent with controller number 0.
Ctl32	MIDI Bank change messages are sent with controller number 32.
Ctl0/32	MIDI Bank change messages are sent with both controller numbers 0 and 32.
K2600	MIDI Bank change messages are sent with the Kurzweil K2600 Bank change controller number.

Pressing both Value buttons simultaneously will set this parameter to **Ctl0/32**.

Zone Status

The Zone Status parameter determines whether the currently selected Zone is active or muted. You can set this parameter to either of two states: **Active** or **Muted**. Pressing both Value buttons simultaneously will set this parameter to **Active**.

Entry Program Change

The Entry Program Change parameter determines whether or not the currently selected Zone can send a MIDI Program change message when the Setup is loaded. You can set this parameter to either **Off** or **On**. When set to **On**, the Zone will send a MIDI Program change message with the Program specified for the MIDI Program parameter (described above). Pressing both Value buttons simultaneously will set this parameter to **On**.

Aux Send Level

The Aux Send Level parameter determines the send level for the auxiliary effects of the currently selected Zone. You can select any level from **0** to **127**. Pressing both Value buttons simultaneously will set this parameter to **20**.

For a description of the auxiliary effects of a Setup, see *About Auxiliary Effects on page 8-14* and *Common Parameters on page 8-14*.

Transpose

The Transpose parameter determines the transposition for the currently selected Zone. You can set this to any value from **-128** semitones to **127** semitones. Pressing both Value buttons simultaneously will set this parameter to **0**.

Entry Pan

The Entry Pan parameter determines the Pan MIDI message that the currently selected Zone sends when the Setup is loaded. You can set this parameter to any pan setting from **0** (full left pan) to **127** (full right pan). For zero panning, select **64** for this parameter. Pressing both Value buttons simultaneously will set this parameter to **64**.

Entry Volume

The Entry Volume parameter determines the Volume MIDI message that the currently selected Zone sends when the Setup is loaded. You can set this parameter to any volume setting from **0** to **127**. Pressing both Value buttons simultaneously will set this parameter to **127**.

Low Velocity

The Low Velocity parameter determines the lowest velocity that a keystroke must have in order to trigger a note in the currently selected Zone. You can set this parameter to any velocity between **1** and **127**. Pressing both Value buttons simultaneously will set this parameter to **1**.

If, for example, you set Low Velocity to **20**, then only keystrokes with velocities of **20** or above will trigger a note. Keystrokes with velocities lower than **20** will not trigger a note.

High Velocity

The High Velocity parameter determines the highest velocity that a keystroke must have in order to trigger a note in the currently selected Zone. You can set this parameter to any velocity between **0** and **127**. Pressing both Value buttons simultaneously will set this parameter to **127**.

If, for example, you set High Velocity to **80**, then only keystrokes with velocities of **80** or below will trigger a note. Keystrokes with velocities higher than **80** will not trigger a note.

Low Key

The Low Key parameter determines the lower boundary of the currently selected Zone. You can set this parameter to any note from **C-1** to **G9**. Pressing both Value buttons simultaneously will set this parameter to **C-1**.

If, for example, you set Low Key to **C4**, then only keys at or above **C4** will trigger a note for the currently selected Zone. Keys below **C4** will not trigger a note.

High Key

The High Key parameter determines the higher boundary of the currently selected Zone. You can set this parameter to any note from **C-1** to **G9**. Pressing both Value buttons simultaneously will set this parameter to **G9**.

If, for example, you set High Key to **C4**, then only keys at or below **C4** will trigger a note for the currently selected Zone. Keys above **C4** will not trigger a note.

Bend Range Down

The Bend Range Down parameter determines the lower bend of the Pitch Wheel. You can set this parameter to any value between **0** semitones and **127** semitones, or to **Prog**, which uses the Bend Range of the currently selected Program for the Zone. Pressing both Value buttons simultaneously will set this parameter to **12** semitones.

Bend Range Up

The Bend Range Up parameter determines the upper bend of the Pitch Wheel. You can set this parameter to any value between **0** semitones and **127** semitones, or to **Prog**, which uses the Bend Range of the currently selected Program for the Zone. Pressing both Value buttons simultaneously will set this parameter to **2** semitones.

Continuous Controller Parameters

The SP4 has seven continuous controllers:

- Mod Wheel
- Control Knob Function 1
- Control Knob Function 2
- Control Knob Function 3
- Control Knob Function 4
- Control Knob Function 5
- The CC Pedal

In Edit Setup mode, each of these controllers has the same three parameters:

Destination

The Destination parameter determines the MIDI destination for the currently selected controller in the currently selected Zone. You can select from the following destinations:

Controller Number	Destination Name	Description
0	OFF/Bank	By default, when you enter 0 or Clear for the Destination parameter, the destination will be assigned to OFF. To select Bank as the destination, use the Value buttons.
1	MWheel	Default assignment for Mod Wheel
2	Breath	Default assignment for breath controller in compatible synths
3	MIDI 03	MIDI Controller 3
4	Foot	Default assignment for continuous foot controller in compatible synths
5	PortTim	Monophonic SP4 programs respond to this Controller if portamento is turned on.
6	Data	Almost all SP4 programs have this Controller assigned to filter frequency or brightness.
7	Volume	MIDI Volume
8	Balance	MIDI Balance
9	MIDI 09	MIDI Controller 9
10	Pan	MIDI Pan
11	Express	MIDI Expression—Default assignment for CC Pedal 1—In most programs it acts as a volume control. It scales between 0 and the current value of Volume.
12	MIDI 12	MIDI Controller 12
13	MIDI 13	
14	MIDI 14	Default destination for Control Knob Function 1 (Timbre)
15	MIDI 15	Default destination for Control Knob Function 2 (Mod)
16	Ctl A	Default destination for Control Knob Function 3 (Envelope)
17	Ctl B	Default destination for Control Knob Function 4 (Effect)
18	Ctl C	Default destination for Control Knob Function 5 (Reverb)
19	Ctl D	

Controller Number	Destination Name	Description
20–31	MIDI 20–31	MIDI Controllers 20–31
32	MIDI Bank	MIDI Bank change message
33–63	MIDI 33–63	MIDI Controllers 33–63
64	Sustain	Default destination for Footswitch 1
65	MIDI 65	
66	Sostenut	Default destination for Footswitch 2—sustains notes that are currently down, but not notes played subsequently.
67	Soft	Lowers the volume by a preset amount and may soften the timbre as well.
68	Legato	Forces mono playback.
69	Freeze	Envelopes freeze at current state.
70–79	MIDI 70–79	MIDI Controllers 70–79
80–83	MIDI 80–83	MIDI Controllers 80–83
84	Portamen	Standard MIDI controller for setting Portamento starting note
85–90	MIDI 85–90	MIDI Controllers 85–90
91	GM Reverb	Reverb send level
92	MIDI 92	MIDI Controller 92
93	GM Chorus	Chorus send level
94–95	MIDI 94–95	MIDI Controllers 94–95
96	Data Inc	Equivalent to pressing the **Next** Value button
97	Data Dec	Equivalent to pressing the **Previous** Value button
98	NRegParL	Non–Registered Parameter Least Significant Byte
99	NRegParM	Non–Registered Parameter Most Significant Byte
100	RegParL	Registered Parameter Least Significant Byte
101	RegParM	Registered Parameter Most Significant Byte
102–119	MIDI 102–119	MIDI Controllers 102–119
120	Sound Off	Stops all sound in the corresponding channel.
121	RstCtls	Resets Controllers to defaults in the corresponding channel.
122	Local	
123	Notes Off	Sends Note Off Message to all playing notes in the corresponding channel.
124	Poly	
125	Omni	
126	Mono On	
127	Mono Off	
128	Pitch	Values above 64 and below 64 bend the pitch up and down, respectively.
129	PitchRev	Values above 64 and below 64 bend the pitch down and up, respectively
130	PitchUp	Values above 0 bend the pitch up
131	PitchDwn	Values above 0 bend the pitch down
132	Pressure	Pressure
133	Tempo	Tempo
134	KeyNum	Triggers playback of notes by Key Number—e.g., C4 is 60. Send a velocity first with Destination135, KeyVel.

Controller Number	Destination Name	Description
135	KeyVel	Key Velocity
136	ProgInc	Program Increment—increments current program number.
137	ProgDec	Program Decrement—decrements current program number.
138	ProgGoto	Go to Program—selects program.
139	SetupInc	Setup Increment—increments current setup number.
140	SetupDec	Setup Decrement—increments current setup number.
141	SetpGoto	Go to Setup—selects setup.
142–144	MIDI 142–144	MIDI Controllers 142–144
145	TransUp	Transpose Up (ST)
146	TransDown	Transpose Down (ST)
147–148	MIDI 147–148	MIDI Controllers 147–148
149	MuteZn	Mute Zone – values above 64 will mute the zone, values below or equal to 64 will unmute the zone.
150–160	MIDI 150–160	MIDI Controllers 150–160
161	Panic	Panic
162	SoloZn	Solo Zone
163–178	MIDI 163–178	MIDI Controllers 163–178

Entry Value

The Entry Value parameter determines the value of the continuous controller that is sent as a MIDI message when the current Setup is loaded. You can set this parameter to any number between **0** and **127**, or to **None**. Pressing both Value buttons simultaneously will set this parameter to **None**.

If Entry Value is set to **None**, then when you load the current Setup, the controller will be at whatever value corresponds to its current position. If you specify an Entry Value, then a MIDI controller message with this value will be sent when you load the current Setup.

Exit Value

The Exit Value parameter determines the value of the continuous controller that is sent as a MIDI message when the current Setup is exited. You can set this parameter to any number between **0** and **127**, or to **None**. Pressing both Value buttons simultaneously will set this parameter to **None**.

If Exit Value is set to **None**, then when you leave the current Setup, the controller will be at whatever value corresponds to its current position. If you specify an Exit Value, then a MIDI controller message with this value will be sent when you close the current Setup.

The Foot Switch Parameters

There are four parameters that affect the behavior of the Foot Switch controller:

Destination

The Destination parameter determines the MIDI destination for the currently selected controller in the currently selected Zone. For a list of the MIDI destinations and their descriptions, see *Destination on page 8-10*.

Mode

The Mode parameter determines the switching action of the Foot Switch. You can set this parameter either of two settings:

Momentary	A momentary switch is one that is only in the "on" state when it is pressed. As soon as you release the switch, it goes into the "off" state.
Toggled	A toggled switch is one that maintains its state after it is pressed. So, if the switch is currently in the "off" state, pressing it once will put it in the "on" state. Pressing it again will put it back in the "off" state.

Pressing both Value buttons simultaneously will set this parameter to **Toggled**.

Entry State

The Entry State parameter determines the state of the Foot Switch that is sent as a MIDI message when the current Setup is loaded. You can set this parameter to **None**, **On**, or **Off**. Pressing both Value buttons simultaneously will set this parameter to **None**.

If Entry State is set to **None**, then when you load the current Setup, the Foot Switch will be at whatever value corresponds to its current position. If you specify an Entry State, then a MIDI controller message with this value will be sent when you load the current Setup.

Exit State

The Exit State parameter determines the state of the Foot Switch that is sent as a MIDI message when the current Setup is exited. You can set this parameter to **None**, **On**, or **Off**. Pressing both Value buttons simultaneously will set this parameter to **None**.

If Exit State is set to **None**, then when you close the current Setup, the Foot Switch will be at whatever value corresponds to its current position. If you specify an Exit State, then a MIDI controller message with this value will be sent when you close the current Setup.

About Auxiliary Effects

Programs and Setups both have an auxiliary effect. An auxiliary effect is an effect that is not in the direct path of the sound, but rather, it "receives" the sound, and then outputs effect-altered sound, which is mixed back with the original sound. The following diagram illustrates the signal path of a sound through the auxiliary effect:
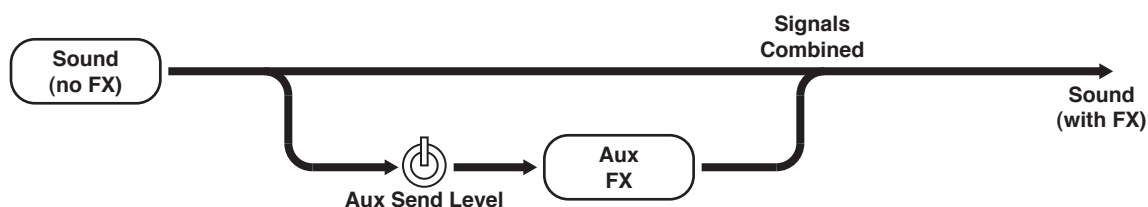
Common Parameters

In addition to the Zone-specific parameters described above, a Setup has two parameters common to all of its Zones. These two parameters determine the auxiliary effect of the Setup.

Aux Effect Override

The Aux Effect Override parameter determines whether or not the auxiliary effect of the Setup is overridden with another effect. You can set this parameter to either **Prog** or to any Chain Effect number between **0** and **999**.

Setting this parameter to **Prog** results in the auxiliary effect of one of the Programs of Setup being used—you specify which Program with the other common parameter Aux Effect Channel, which is described below. Setting Aux Effect Override to any of the Effect Chains allows you to select an auxiliary effect not present in any of the Programs being used in the Setup. Either way, the same auxiliary effect is used for all of the Zones of the Setup.

Aux Effect Channel

With Prog selected for the Aux Effect Override parameter, the Aux Effect Channel parameter allows you to choose which Zone's auxiliary effect is used for the entire Setup. You can set this parameter to any of MIDI channels of the Zones currently in use within the Setup.

Selecting the channel of one of the active Zones within the Setup will load the auxiliary effect of that Zone's Program as the auxiliary effect of the Setup. Note that changing this parameter only results in a change in sound if Prog is selected for Aux Effect Override. If an Effect Chain is specified for Aux Effect Override, then that effect—not the effect on the channel specified for Aux Effect Channel—will be in use.

Saving in Setup Mode

When you make a change to the current Setup using the Control Knob, the **Save** button LED will light up indicating that a change has been made to the Setup. To save the current Setup, press the **Save** button once. The **Save** button LED will blink to indicate that a save operation is underway, and the User Bank LED will also be lit. If the Setup is an edited Factory Setup (i.e., a Setup in Bank 1), the default save location will be the next available location in the User Bank. If all 64 User Bank slots are taken, then the Setup is saved in the last slot in the User Bank, overwriting what was previously in that slot. If the current Setup is a Setup already in the User Bank, then the Setup is saved in its current Setup slot. At this point, you can rename the new Setup using the secondary alphanumeric functions of the Group Select and Sound Select buttons.

When the **Save** button LED is blinking (which means that you pressed Save, and a save operation is underway), pressing **Save** again will cause the system to save the current Setup to the indicated Group and Sound in the User Bank. If you want to save it to a different location in the User Bank, select the location via the Group Select and Sound Select buttons (or using the Value buttons) before pressing **Save** again.

Pressing any other button while the **Save** button is blinking will cancel the save operation.

Chapter 9
Global Mode

This chapter will help you familiarize yourself with the features of Global mode.

Global Mode gives you access to the global parameters of the SP4—that is, it allows you to edit the master settings of the unit. It also allows you to restore factory defaults on the unit by performing a Hard Reset.

⚠️ **CAUTION:** PERFORMING A HARD RESET WILL DELETE ALL USER-CREATED PROGRAMS, SETUPS, AND GLOBAL SETTINGS.

To enter Global mode from another mode, press the **Global** Function button. While you are in Global mode, the **Global** button's indicator LED is illuminated. When you enter Global mode, the last selected parameter since power-up (or the Tuning parameter if you're entering Global mode for the first time since power-up) will be the currently selected parameter.
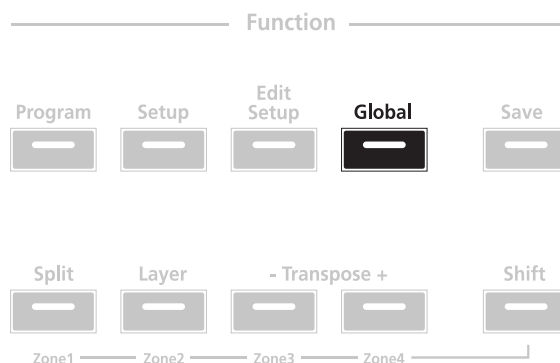
Selecting and Editing Parameters

To scroll through the parameters (and dialogues) of Global mode, use the **Chan / Param** buttons.

Parameter or Dialogue	Range of Values	Default Value
Tuning	-100 to 100 Cents	0 Cents
Velocity Map (VMap)	Linear, Light 1, Light 2, Light 3, Hard 1, Hard 2, Hard 3, Piano Touch, Easy Touch, GM Receive	Medium
FX Select (FXSel)	Performance, Multitrack	Performance
Channel Enable (ChanEn)	Enable, Disable	Enable
Destination (Dest)	Local, MIDI, Local+MIDI	Local+MIDI
Bank Select (BankSel)	None, Ctl0, Ctl32, Ctl0/32	Ctl0/32
Program Change (ProgChg)	On, Off	On
Local Keyboard Channel (LclKbdChan)	1 to 16	1
SysEx ID	0 to 127	0
Hard Reset?	(See corresponding sections below)	
Save All?		
Load All?		

To edit the currently selected parameter, simply use the **Next** and **Previous** Value buttons below the display. Pressing both Value buttons simultaneously will jump to a different value depending on the parameter—the jump value is mentioned in each of the parameter descriptions below. Additionally, you can use the secondary numeric functions of the Group Select and Sound Select buttons:
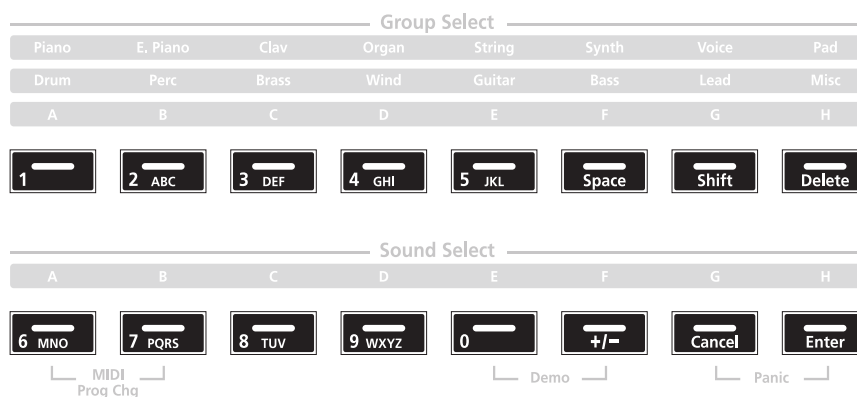
The Global Parameters

The following are the global parameters of the SP4. The settings of these parameters are in effect regardless of what Program or Setup you have currently selected.

Tuning

The Tuning parameter allows you to fine-tune the unit in cents—one cent is one hundredth of a semitone (**100** cents comprise a semitone). You can select any tuning from **-100** cents to **100** cents. By default this parameter is set to **0**. Pressing both Value buttons simultaneously will set this parameter to **0**.

Velocity Map (VMap)

The Velocity Map (VMap) parameter determines the way the SP4 generates MIDI velocity information. Different maps generate different MIDI velocity values for the same physical key strike velocity (note that this setting is applied to notes on top of any velocity settings made per Setup, per Zone). The default map (**Linear**) provides the widest range of velocity expression, but you may want to choose different map if the default does not suit your playing style You can select from any of the following settings:

Linear	The MIDI output velocity is directly proportional to the strike velocity. The highest possible MIDI velocity will be output from the fastest velocity that the physical keys can detect, and the lowest possible MIDI velocity will be output from the slowest velocity that the physical keys can detect. All other MIDI and strike velocities are evenly spaced between these two extremes in the **Linear** map, allowing for an even distribution of strike and MIDI velocities.
Light 1 **Light 2** **Light 3**	The MIDI output velocity is higher than with the **Linear** Velocity Map. From **Light 1** to **Light 3**, it is easier to produce high MIDI velocity values for the same key strike velocity (with **Light 3** being the easiest). These maps are best suited for ensemble playing.
Hard 1 **Hard 2** **Hard 3**	The MIDI output velocity is lower than with the **Linear** Velocity Map. From **Hard 1** to **Hard 3**, it is harder to produce high MIDI velocity values for the same key strike velocity (with **Hard 3** being the hardest).

Piano Touch	The MIDI output velocity is similar to the strike velocity response of an acoustic piano, and is best suited for playing acoustic piano programs.
Easy Touch	This Velocity Map is similar to the **Light** Maps and make high MIDI velocities easier to produce. But, it allows more sensitive control over producing high MIDI velocities by not boosting the MIDI velocity for fast strike velocities as much as it does for medium strike velocities.
GM Receive	This Velocity Map mimics the Velocity Map commonly used by keyboards that use the General MIDI (GM) sound set. The **GM Receive** Map makes medium strike velocities produce higher MIDI velocities compared to the **Linear** map. **GM Receive** affects notes from the SP4's keyboard as well as those from the MIDI in port.

Pressing both Value buttons simultaneously will set this parameter to **Linear**.

FX Select (FXSel)

The FX Select (FXSel) parameter determines how the SP4 responds to interrupts with regards to effects. You can set this parameter to either **Performance** or **Multitrack**. Pressing both Value buttons simultaneously will set this parameter to **Performance**.

With FX Select set to **Performance**, the SP4 minimizes disruption of existing effects when changing Programs, and entry values will not disrupt sustained notes when changing Programs in Program Mode. When controlling the SP4 from an external sequencer in Program Mode, setting FX Select to **Multitrack** will minimize effect disruption.

Channel Enable (ChanEn)

For each of the 16 MIDI channels, you can set the Channel Enable (ChanEn) parameter to either **Enable** or **Disable**. For each channel, setting this parameter to Enable enables the channel to transmit and receive MIDI messages and setting it to **Disable** disables such functions. Pressing both Value buttons simultaneously will set this parameter to **Enable**.

Destination (Dest)

The Destination parameter determines the destination of MIDI data generated by striking keys or activating controllers. This data can be sent to the SP4 sound engine, through the MIDI out ports, or both. You can set this parameter to any of the three destinations for this parameter:

Local	MIDI data is sent only to the SP4 sound engine. The MIDI OUT port is disabled.
MIDI	MIDI data is sent only through the MIDI OUT port. The sounds of the SP4 are disabled.
Local+MIDI	MIDI data is sent both to the SP4 sound engine and through the MIDI OUT port.

Select the desired destination depending on your needs. If you want to play the SP4, but not send any MIDI information to other MIDI instruments, then select Local. If you want to use the SP4 strictly as a MIDI controller for the other modules in your MIDI chain, then select MIDI. If you want to make use of the SP4's sounds as well as use it as a MIDI controller, then select Local+MIDI.

Pressing both Value buttons simultaneously will set this parameter to **Local+MIDI**.

Bank Select (BankSel)

The Bank Mode parameter determines the controller number with which MIDI Bank change messages are transmitted. For MIDI Bank change messages, various manufacturers have chosen different MIDI controller numbers. Most have chosen 0, 32, or both.

You can set this parameter to any of the following four controller IDs:

None	MIDI Bank change messages are disabled.
Ctl0	MIDI Bank change messages are sent with controller number 0.
Ctl32	MIDI Bank change messages are sent with controller number 32.
Ctl0/32	MIDI Bank change messages are sent with both controller numbers 0 and 32.

Pressing both Value buttons simultaneously will set this parameter to **Ctl0/32**.

Program Change (ProgChg)

The Program Change (ProgChg) parameter determines whether or not entry MIDI Program Change messages are sent for Setups. You can set this parameter to either **On** or **Off**. Pressing both Value buttons simultaneously will set this parameter to **On**.

Note that when you perform a MIDI Program Change through MIDI Program Change Mode, the setting of the Global Program Change parameter (as well as the setting of the Global MIDI Transmit parameter) is ignored.

Local Keyboard Channel (LclKbdChan)

Changing the setting of the Local Keyboard Channel parameter is useful only when your SP4 is receiving MIDI information from an external source. Perhaps you have a favorite MIDI keyboard that you use to control all the gear in your studio, or you use a lot of outboard sequencing. If you're using the SP4 as a standalone music workstation or performance keyboard, you can ignore this parameter.

The local keyboard channel enables the SP4 to receive MIDI information on a single channel, then rechannelize that information so you can play and control all four zones of a setup, even if your MIDI source transmits on only one channel. When you're in Program mode, the local keyboard channel remaps incoming information to the SP4's current channel. When using the local keyboard channel all the MIDI information received on the Local Keyboard Channel also gets sent—after being remapped—to the SP4's MIDI and USB Out ports.

You may find it more convenient to use the local keyboard channel. In this case, the SP4 remaps incoming MIDI to the SP4's current channel, so in Program mode, you'll always play the program on the SP4's current channel. Incoming MIDI also gets sent to the SP4's MIDI and USB Out port. On the other hand, in this case your MIDI source's transmitting channel must match the SP4's local keyboard channel for anything to work.

Things are a bit different for playing Setups. In this case, you must use the Local Keyboard Channel to be able to play and control all of the Setup's zones. Set LclKbdChan to match the channel your external MIDI source is using (if for example your MIDI source transmits on Channel 1, set LclKbdChan to 1). All MIDI information that the SP4 receives on the local keyboard channel gets remapped to the channels and control destinations used by the zones in the setup.

The SP4 also remaps certain MIDI Controller messages that it receives on the Local Keyboard Channel, so that they correspond (in most cases) to the default assignments for the SP4's physical controllers (Mod Wheel, control knob, etc.). Physical controller assignments are handled by Setups, and are defined per Zone in Edit Setup Mode. Each Zone of a setup has its own controller assignments.

Sysex ID

The SysExID parameter determines the ID number for the unit if you are using more than one device with the same MIDI manufacturer ID number. You can set this parameter to any number from **0** to **127**.

Unless you have multiple SP4s receiving Sysex messages from a single source, you will not need to change the Sysex ID from the default setting of **0**.

If you do have multiple SP4s receiving Sysex messages from a single source, make sure each SP4 has a different Sysex ID. This will allow you to direct Sysex messages to the appropriate SP4 by specifying which unit with the Sysex ID byte that's included with every Sysex message.

To have the unit respond to Sysex messages regardless of the Sysex ID, set Sysex ID to **127**.

The "Hard Reset?" Dialogue

CAUTION: PERFORMING A HARD RESET WILL DELETE ALL USER-CREATED PROGRAMS AND SETUPS AND WILL RESTORE ALL PARAMETERS TO DEFAULT VALUES. THIS ACTION CANNOT BE UNDONE.

The "Hard Reset?" dialogue allows you to restore factory defaults to the SP4. Pressing Next in this dialogue will change the display to "Confirm?" Pressing **Next** in the "Confirm?" dialogue will result in a hard reset—pressing **Previous** in the "Confirm?" dialogue will recall the "Hard Reset?" dialogue.

Be sure to save your work off to external storage (See *"The "Save All?" Dialogue" on page 9-7*). Once deleted, the files are completely removed from the SP4 and there is no way to retrieve them.

To exit the Hard Reset dialogue, simply select another parameter using the **Chan / Param** buttons, or enter another Mode using the Mode Functions buttons.

The "Save All?" Dialogue

The "Save All?" dialogue allows you to save every User-bank Program and User-bank Setup to a computer connected to the unit via USB. You can select **Yes** by pressing the **Next** Value button—pressing **Previous** will do nothing.

If a computer is connected and you select **Yes**, the display will show the message "Press Next for saving the file". Pressing **Previous** will cancel the save operation and recall the "Save All?" dialogue. Pressing **Next** will save to the SP4 temporary drive and the display will show the message "The file is in the temporary drive, copy it to your hard disk". If an error occurs during the save operation, then the display will show the error message "Save Error".

If the SP4 is not connected to a computer, the display will show the error message "Please connect the unit to the computer". Pressing Previous will recall the "Save All?" dialogue—pressing **Next** will retry to connect.

The "Load All?" Dialogue

The "Load All?" dialogue allows you to load a file containing previously saved User-bank Program and User-bank Setup from a computer connected to the unit via USB. You can select **Yes** by pressing the **Next** Value button—pressing **Previous** will do nothing.

If a computer is connected and you select **Yes**, the SP4 will appear on the connected computer as a temporary drive and the display will show "Put the file to be loaded into the temporary drive". Pressing **Previous** will cancel the load operation and recall the "Load All?" dialogue. Pressing **Next** will load the file and the display will show "File loaded". If no file is in the SP4 temporary drive during the load, the display will show the message "Nothing loaded". If an error occurs during the load operation, then the display will show the error message "Load Error".

If the SP4 is not connected to a computer, the display will show the error message "Please connect the unit to the computer". Pressing Previous will recall the "Load All?" dialogue—pressing Next will retry to connect.

Chapter 10
System Mode

⚠ <u>**CAUTION:** DO NOT ATTEMPT TO MAKE ANY CHANGES IN SYSTEM MODE UNTIL YOU HAVE READ AND FULLY UNDERSTOOD THIS ENTIRE CHAPTER.</u>

This chapter will help you familiarize yourself with the functions of System Mode.

System Mode allows you manage and upgrade the OS software of your SP4 as well as perform diagnostic tests of the instrument's various internal systems and processes. Note that the functions that you have access to in System Mode govern the operation of your SP4, so only use System Mode when you must perform essential maintenance tasks.

To enter System Mode, follow these steps:

1. Power off your SP4.

2. Press and the hold the **Shift** button, and power on the unit. The display will show the text "Loading..." as if you were normally starting up the unit. Make sure to keep holding the Shift button until the text "SP4 bootloader v*x.x*" (where *x.x* is the version of the bootloader software) scrolls across the display. After this splash screen, you will be offered with the option "Run SP4_SP76II".

3. Release the **Shift** button—at this point, you are in System Mode.

Using the **Chan / Param** buttons, you can scroll through the list of actions of System Mode:

- Run SP4
- Update Software
- Run Diagnostics
- System Reset
- File Utilities

⚠ <u>**CAUTION:** THE System Reset AND File Utilities OPERATIONS BOTH ERASE ALL USER OBJECTS.</u>

Buttons in System Mode

The following buttons have the following functionalities in System Mode:

Previous	Move to parent menu. Similar to a "cancel" button.
Next	Make selection and move into sub-menu if any. Like an "OK" button.
Chan / Param Up	Move to "previous" menu option within a menu/sub-menu or scroll up to read diagnostic or other results/messages, when diagnostics are complete.
Chan / Param Down	Move to "next" menu option, when in a menu or scroll down to read diagnostic or other results/messages, when diagnostics are complete.

Run SP4

This is first option that System Mode offers. Pressing **Next** will load the OS and the SP4 will start up as if you just switched on the unit (except for the "Loading..." message that happens when you first start up the unit).

Update Software

This group of operations is used to install OS and Object updates from Kurzweil. The Update files have an extension "KUF", which is a compressed archive of all software updates required for the system.

Update

1. Obtain the Update file from the Kurzweil website or another reliable source, save it in a known folder or directory your computer.

2. Connect the SP4 (powered off) to your computer with a USB cord. Then enter System Mode as specified on *page 10-1*. The SP4 will appear as drive on your computer.

3. Press **Chan / Param Down** once. This will take you to the next option which is "Update Software". Press **Next** to select this group of operations. This will give you with the option "Update".

4. Press **Next** to start the Update operation. The displayed message will ask you to copy the Update file to the SP4 drive on your computer. Copy the file. Once copied, "Safely Remove" or "Unmount" the removable disk/drive from your computer.

5.   Press **Next** on your SP4. If the KUF file is valid, then the SP4 will display the message "Updating". This will take a minute or two.

6.   Once you see a "Done" message, power cycle unit or press **Previous** to go back to System Mode main menu.

Restore

Whenever you update the SP4's software, a backup of the currently installed software is made. This is in case of a need to revert back to the old software, such as if the new update has problems or for simply for troubleshooting.

NOTE: Only the previously installed version of the software is backed up. When you perform a Restore operation again, the current version is backed up. So, it's possible to go back and forth between versions.

Unlike the Update operation, the Restore operation can be performed without a computer connected to the SP4:

1.   Start off by entering System Mode as specified on *page 10-1*.

2.   Press **Chan / Param Down** once. This will take you to the next option which is "Update Software". Press **Next** to select this group of operations. This will give you with the option "Update".

3.   Press **Chan / Param Down** once. This will take you to the next option which is "Restore".

4.   Press **Next** to perform the Restore operation.

Run Diagnostics

You will most likely not need to use the Run Diagnostics operations in normal cases. These operations are mostly used at the factory and service centers by engineers for troubleshooting problems with hardware. But, in some cases you might be required to run these diagnostics for troubleshooting and diagnosing symptoms. In these cases, following the direction of an authorized Kurzweil technician.

System Reset

CAUTION: THIS OPERATION ERASES ALL USER OBJECTS.

If you've made many, complex updates to your Objects, and have saved a number of files off to external storage, you might want to restore the instrument to its default state. This is especially helpful if you're having problems getting sound programs or setups to work properly, or think there may be some kind of underlying hardware problem.

To clear all user objects and restore the factory default state, select the System Reset utility using the **Chan / Param** buttons, and then press the **Next** Value button. The SP4 will ask you to confirm this action. Press the **Next** Value button to complete the system reset, or press the **Previous** Value button to stop the operation.

Remember to save your work off to external storage using Global Mode (See *The "Save All?" Dialogue on page 9-7*). Once deleted, the files are completely removed from the SP4 and there is no way to retrieve them.

File Utilities

⚠ **CAUTION:** THIS OPERATION ERASES THE OPERATING SYSTEM, ALL FACTORY OBJECTS AND ALL USER OBJECTS.

File Utilities has only one operation: Format. Performing this operation will format the SP4's system flash memory and erase the OS software as well as *all* Objects. Do not do this unless you think it is necessary in order to improve the performance of your SP4. Should you decide to do so, be sure to back up all of your files and software. After you do this, System Mode will still be available, so you can run updates and get your SP4 up-and-running again. After a Format the unit will come up in System Mode by default.

To perform a Format, follow these steps:

1. Start off by entering System Mode as specified on *page 10-1*.

2. Press **Chan / Param Up** once. This will take you to the previous option which is "File Utilities". Press **Next** to select this operation. The unit display the message "Delete All?".

3. Press **Next** to perform the Format operation.

Chapter 11
Tutorials

This chapter contains tutorials on editing Objects. By going through them step-by-step, you will better understand the process of the editing Setups. Additionally, this chapter will point you in the right direction for descriptions on performing certain technical tasks.

Creating a Setups from a Program

These tutorials will help you create a two-Zone Setup (as either a Split or a Layer) from a Program. Recall that when you create a Split or Layer while in Program Mode, you are in fact creating a Setup. These Functions are convenient, as you do not need to go through Edit Setup Mode to delineate Zones, assign Programs, etc. You can simply hit the **Split** or **Layer** Function button, and the SP4 automatically creates a two-Zone Setup for you, with default values for parameters of the Split or Layer.

Creating a Split Setup from a Program

As an example for this tutorial, let's consider creating a Split Setup with a synth Program for the left-hand keyboard region (aka, the Secondary Voice) and a guitar Program for the right-hand keyboard region (aka, the Primary Voice). Let's make the division of regions be at B2 (an octave and a half-step below C4, or middle-C) so that the right-hand region has a lot of "room" for soloing. Finally, let's have the right-hand region be slightly louder than the left-hand region, and have the left-hand region lowered by an octave. The following figure illustrates this scenario:
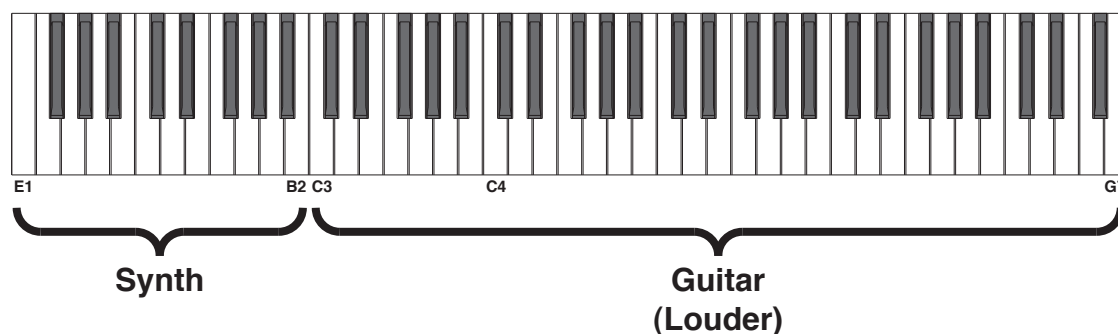
To create this Split Setup follow these steps. Be careful not to exit any of the Split parameter pages before the Split Setup is complete. If you do, then simply exit Program Mode and then enter it again and start from step 1:

1. Enter Program Mode by pressing the **Program** Function button. Using the Value buttons or Object Select buttons, choose the Program you want for the Primary Voice of the Split. For our example, let's choose Program **102 Rockin' Lead**.

2. Press the **Split** Function button. Doing this makes the SP4 create a Setup with a two active Zones split at middle-C. At this point, both Voices are identical (except for their keyboard regions and MIDI transmit channels): they have the same Program, Volume, and Transposition. The following figure illustrates our current Split Setup:

E1   C4   G7
                                      C#4

102 Rockin' Lead   **102 Rockin' Lead**
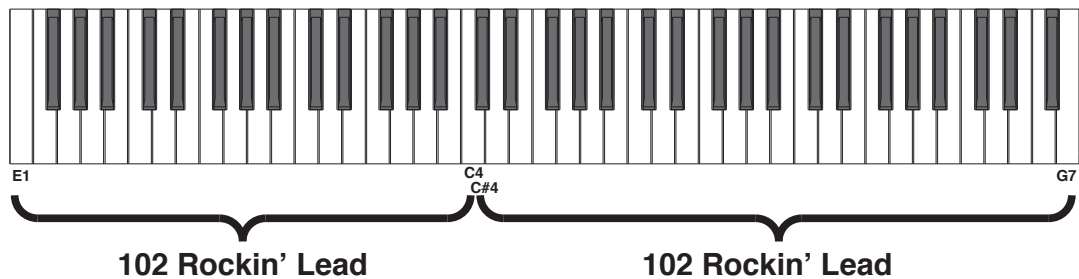
Note that as soon as we hit the Split Function button, the **Save** button illuminates. This simply indicates that a change has been made. The **Save** button will be involved in the final step of this process.

3. Let's now change the Split Program. Recall that the Split Program determines the Program for the Secondary Voice. At this point the display should read "Split Program: 102 Rockin' Lead". Use the Value buttons or Object Select buttons to choose a Program. For our example, let's choose Program **40 Classic Comp** for the Split Program. The following figure illustrates our current Split Setup:

E1   C4   G7
                                      C#4

40 Classic Comp   **102 Rockin' Lead**
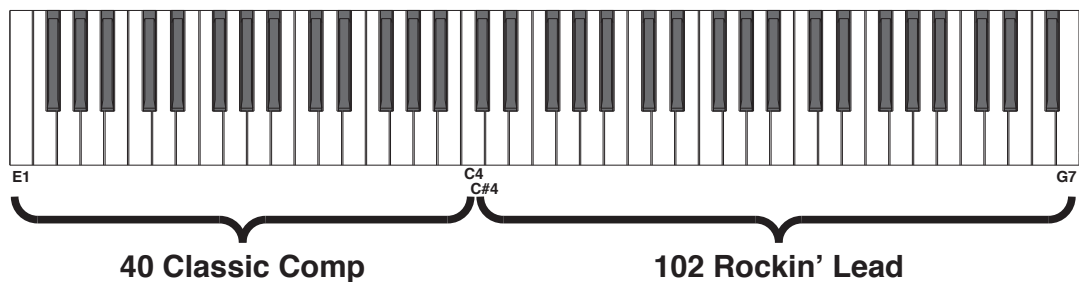
4. Let's now change the Split Volume. Recall that the Split Volume determines the *relative* volumes of the two Voices: positive values increase the volume of the Secondary Voice and decrease the volume of the Primary Voice. Negative values decrease the volume of the Secondary Voice and increase the volume of the Primary Voice.

   First, use the **Chan / Param** buttons to select the Split Volume parameter. Then, use the Value buttons to set the Split Volume. For our example, since we want our guitar to be slightly louder than our synth, let's set this parameter to **-20**.

5. Let's now change the Split Key. Recall that the Split Key determines the lowest note in the Primary Zone—one note below this note is the highest note in the Secondary Zone.
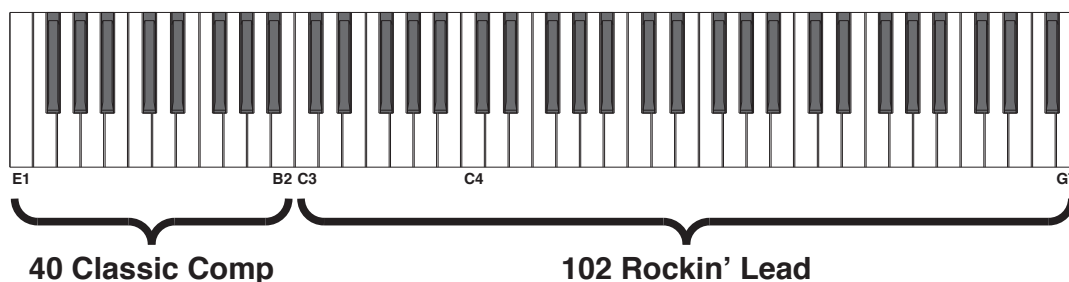
   First, use the **Chan / Param** buttons to select the Split Key parameter.

   NOTE: You can directly select the Split Key by holding down the Sound Select **H** (aka **Enter**) button and then striking the desired key on the keyboard (you can also use the Value buttons to set this parameter).

   For our example, let's select B2 by the method just described or by using the Value buttons to set Split Key to **47** (recall that middle-C, or C4, has a note number of 64).

   The following figure illustrates our current Split Setup:

   | **40 Classic Comp** | **102 Rockin' Lead** |

6. Let's now change the Split Transposition. Recall that the Split Transposition determines the transposition of the Secondary Voice relative to that of the Primary Voice. It can be set to **-24**, **-12**, **0**, **12**, and **24**.

   First, use the Chan / Param buttons to select the Split Transposition parameter. Then, use the Value buttons to set the Split Transposition. For our example, since we want our synth to be one octave lower than normal, let's set this parameter to **-12**.

7. Finally, let's now save our newly-created Setup. Recall that the **Save** button is illuminated. To save our Setup, press the **Save** button once. The **Save** button LED will blink to indicate that a save operation is underway, and the User Bank LED will also be lit. The default save location will be the next available location in the Setup User Bank. If all 64 User Bank slots are taken, then the Setup is saved in the last slot in the User Bank, overwriting what was previously in that slot. If the current Setup is a Setup already in the User Bank, then the Setup is saved in its current Setup slot. At this point, you can rename the new Setup using the secondary alphanumeric functions of the Group Select and Sound Select buttons.

When the **Save** button LED is blinking (which means that you pressed Save, and a save operation is underway), pressing **Save** again will cause the system to save the Setup to the indicated Group and Sound in the User Bank. If you want to save it to a different location in the User Bank, select the location via the Group Select and Sound Select buttons (or using the Value buttons) before pressing **Save** again.

Pressing any other button while the **Save** button is blinking will cancel the save operation.

Your Split Setup is now complete!

Creating a Layer Setup from a Program

As an example for this tutorial, let's consider creating a Layer Setup with a layer of vibes and a layer of flute. Let's have the vibes be slightly louder than the flute, and have the flute lowered by an octave. For our example, we'll refer to the vibes as the Primary Voice and the flute as the Secondary Voice. The following figure illustrates this scenario:
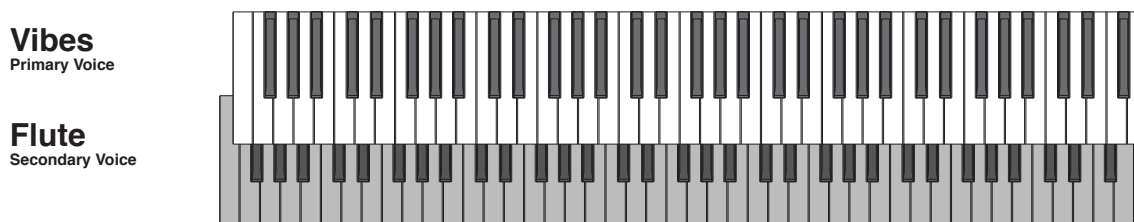
To create this Layer Setup follow these steps. Be careful not to exit any of the Layer parameter pages before the Layer Setup is complete. If you do, then simply exit Program Mode and then enter it again and start from step 1:

1. Start by entering Program Mode by pressing the **Program** Function button. Using the Value buttons or Object Select buttons, choose the Program you want for the Primary Voice. For our example, let's choose Program **76 Real Vibes**.

2. Press the **Layer** Function button. Doing this makes the SP4 create a Setup with a two Zones with the same keyboard regions--i.e., overlapping keyboard regions. At this point, both Voices are identical (except for channel): they have the same Program, Volume, and Transposition. The following figure illustrates our current Setup:
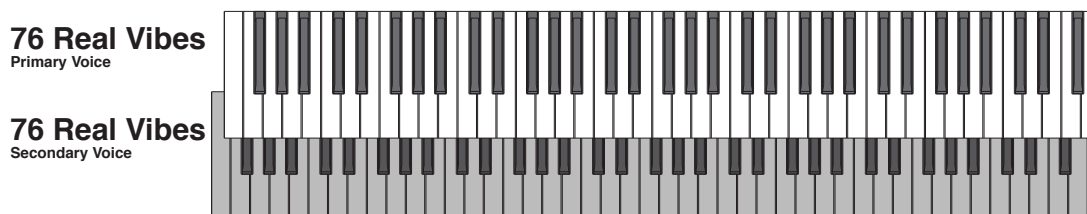
Note that as soon as we hit the Layer Function button, the **Save** button illuminated. This simply indicates that a change has been made. The **Save** button will be involved in the final step of this process.

3. Let's now change the Layer Program. Recall that the Layer Program determines the Program for the Secondary Voice. At this point the display should read "Layer Program: 76 Real Vibes". Use the Value buttons or Object Select buttons to choose a Program. For our example, let's choose Program **88 Solo Flute** for the Layer Program.

    The following figure illustrates our current Layer Setup:

    76 Real Vibes
    Primary Voice

    88 Solo Flute
    Secondary Voice
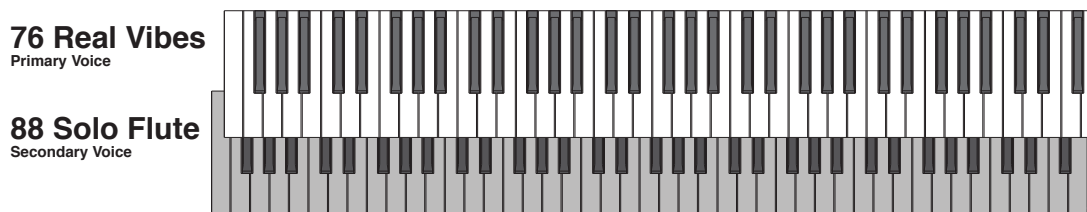
4. Let's now change the Layer Volume. Recall that the Layer Volume determines the *relative* volumes of the two Voices: positive values increase the volume of the Secondary Voice and decrease the volume of the Primary Voice. Negative values decrease the volume of the Secondary Voice and increase the volume of the Primary Voice.

    First, use the **Chan / Param** buttons to select the Layer Volume parameter. Then, use the Value buttons to set the Layer Volume. For our example, since we want our vibes to be slightly louder than our flute, let's set this parameter to **-20**.

5. Let's now change the Layer Transposition. Recall that the Layer Transposition determines the transposition of the Secondary Voice relative to that of the Primary Voice. It can be set to **-24**, **-12**, **0**, **12**, and **24**.

    First, use the **Chan / Param** buttons to select the Layer Transposition parameter. Then, use the Value buttons to set the Layer Transposition. For our example, since we want our flute to be one octave lower than normal, let's set this parameter to **-12**.

6. Finally, let's now save our newly-created Layer Setup. Recall that the **Save** button is illuminated. To save our Layer Setup, press the **Save** button once. The **Save** button LED will blink to indicate that a save operation is underway, and the User Bank LED will also be lit. The default save location will be the next available location in the Setup User Bank. If all 64 User Bank slots are taken, then the Setup is saved in the last slot in the User Bank, overwriting what was previously in that slot. If the current Setup is a Setup already in the User Bank, then the Setup is saved in its current Setup slot. At this point, you can rename the new Layer Setup using the secondary alphanumeric functions of the Group Select and Sound Select buttons.

    When the **Save** button LED is blinking (which means that you pressed Save, and a save operation is underway), pressing **Save** again will cause the system to save the Layer Setup

to the indicated Group and Sound in the User Bank. If you want to save it to a different location in the User Bank, select the location via the Group Select and Sound Select buttons (or using the Value buttons) before pressing **Save** again.

Pressing any other button while the **Save** button is blinking will cancel the save operation.

Your Layer Setup is now complete!

Creating a Layer Setup with Velocity-dependent Zones

This tutorial will help you create a Setup with two active Zones such that one Zone will be heard when the Setup is played softly and the other Zone will be heard when the Setup is played loudly. As an example for this tutorial, let's consider creating a Setup in which an acoustic guitar is heard when the Setup is played softly, and an electric guitar is heard when the Setup is played loudly. Additionally, let's have our example Setup be louder when the electrical guitar is heard.

1. First we need a Setup with two active Zones. The easiest way to create such a Setup that will serve the purpose of this tutorial is by creating a two-Layer Setup (see *Creating a Layer Setup from a Program on page 11-4*). For our example, let's choose Program **96 Ac Guitar** for our Primary Voice and Program **102 Rockin' Lead**. Set the following Layer parameters like so:

Layer Program	**102 Rockin' Lead**
Layer Volume	**20**
Layer Transposition	**0**

Remember to save your Setup!

Alternatively, we could edit a factory Setup. This, however, would take longer since we would have to check all of the parameters for both active Zones to make sure that they are equal before we start editing the parameters that differ between Zones.

Let's now go into Edit Setup Mode by pressing the **Edit Setup** Function button. In this Mode, we will alter the velocity ranges of the Zones in our Setup. See *Edit Setup Mode on page 8-1* for more information on the parameters of a Setup.

For Zone 1 (our acoustic guitar Zone), set the following two parameters like so (use the **Chan / Param** buttons to select the parameters and the Value buttons to edit them):

Low Velocity	**1**
High Velocity	**96**

For Zone 2 (our acoustic guitar Zone), set the following two parameters like so (again,

use the **Chan / Param** buttons to select the parameters and the Value buttons to edit them):

Low Velocity	**97**
High Velocity	**127**

2.   Finally, let's now save our newly-created Setup. Recall that the **Save** button is illuminated. To save our Layer Setup, press the **Save** button once. The **Save** button LED will blink to indicate that a save operation is underway, and the User Bank LED will also be lit. The default save location will be the next available location in the Setup User Bank. If all 64 User Bank slots are taken, then the Setup is saved in the last slot in the User Bank, overwriting what was previously in that slot. If the current Setup is a Setup already in the User Bank, then the Setup is saved in its current Setup slot. At this point, you can rename the new Setup using the secondary alphanumeric functions of the Group Select and Sound Select buttons.

When the **Save** button LED is blinking (which means that you pressed Save, and a save operation is underway), pressing **Save** again will cause the system to save the Layer Setup to the indicated Group and Sound in the User Bank. If you want to save it to a different location in the User Bank, select the location via the Group Select and Sound Select buttons (or using the Value buttons) before pressing **Save** again.
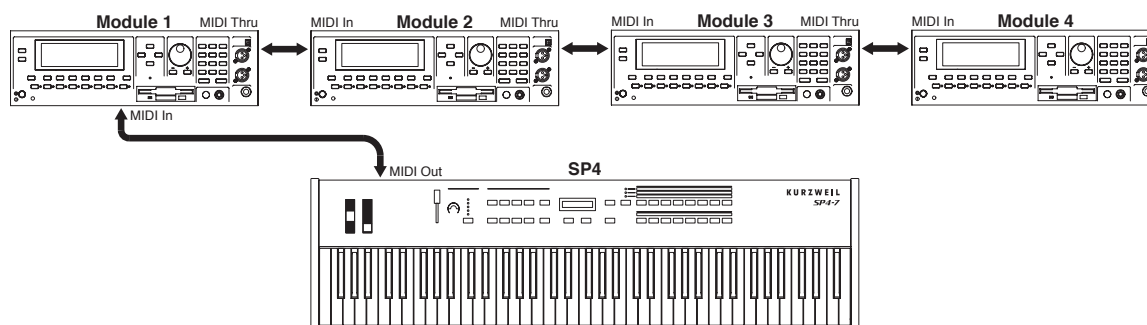
Pressing any other button while the **Save** button is blinking will cancel the save operation.

Your Setup is now complete!

Controlling Multiple Modules with a Single Setup

This tutorial will help you create a Setup with which you can control four different sound modules connected to your SP4 via MIDI. Before reading this tutorial be sure to read *Connecting MIDI on page 2-7*.

First, consider the following arrangement:

Note that the SP4 is being used as the MIDI controller for all four of the modules. To be able to control each of the four modules individually, we need to create a Setup with four non-overlapping Zones, each of which will control a particular module. For our example, let's say the following:

- We want only to use the SP4 as a MIDI controller for the other modules
- All of our Modules will have the same panning, volume, velocity range, and bend range.
- The Foot Switch will act as a sustain pedal for only Module 1
- The Mod Wheel will affect only Module 2, for which it will act as a Mod Wheel.
- Control Knob Function 1 will affect only Module 3 and Module 4, for both of which it will act as a Volume control.
- The Zones will have the following ranges and affect only the following Modules set to the following MIDI Channels, Programs, and Banks:

Zone	Range		Module	Channel	Bank	Program
Zone 1	C6-G7		Module 1	1	2	3
Zone 2	F4-B5		Module 2	2	5	112
Zone 3	C3-E4		Module 3	3	3	67
Zone 4	E1-B2		Module 4	4	0	23
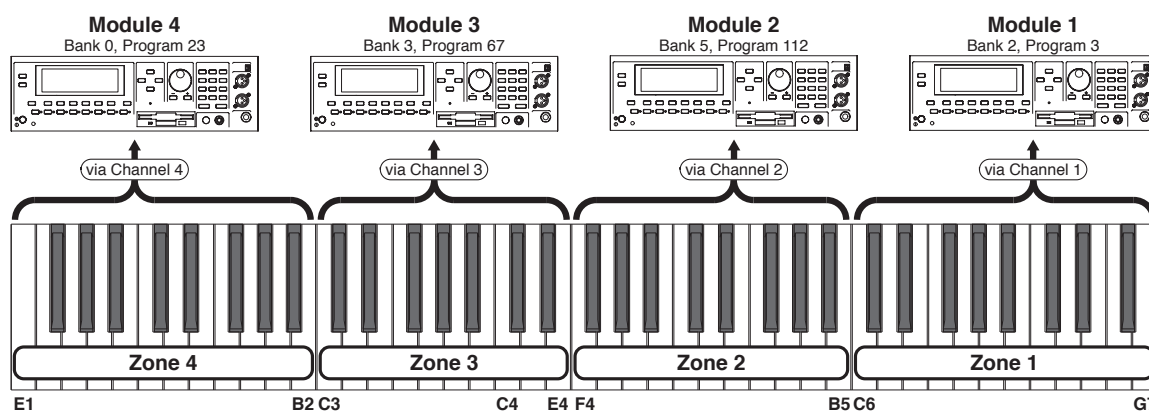
1. First, we need a Setup. Let's pick any factory Setup to work with. We will alter the parameter values of the Zones in the steps to follow.

2. Let's now go into Edit Setup Mode by pressing the **Edit Setup** Function button. In this Mode, we will alter the parameters of our Setup. See *Edit Setup Mode on page 8-1* for more information on the parameters of a Setup.

3. Let's now set all of the parameters that will be the same for all Zones. Note that if the parameter is the same as the default value, you can simply press both Value buttons simultaneous to set the parameter to the default value. An asterisks (*) indicates a default value:

Parameter for Each Zone	Value
Destination	MIDI
Bank Mode	Ctl0/32*
Zone Status	Active*
Entry Program Change	On*
Transpose	0*
Entry Pan	64*
Entry Volume	127*
Low Velocity	1*
High Velocity	127*
Bend Range Down	12 ST*
Rend Range Up	12 ST*

Since we will not be using local sound, the settings for the following parameters are inconsequential:

Parameter for Each Zone
Local Program
Destination
Zone Status
Entry Program Change
Aux Send Level

Common Parameter
Aux Effect Override
Aux Effect Channel

4. Let's now set the following Zone-specific parameters thusly (note that "Unassigned Number" means a MIDI controller number that is unassigned on the target Module):

Zone 1

Parameter	Value
Channel	1
MIDI Bank	2
MIDI Program	3
Low Key	C6
High Key	G7
Foot Switch Destination	64
Foot Switch Mode	Momentary
Foot Switch Entry State	Off
Foot Switch Exit State	Off
All Other Controller Destinations	Unassigned Number
All Other Controller Entry States	0
All Other Controller Exit States	0

Zone 2

Parameter	Value
Channel	2
MIDI Bank	5
MIDI Program	112
Low Key	F4
High Key	B5
Mod Wheel Destination	1
Mod Wheel Entry State	0
Mod Wheel Exit State	0
All Other Controller Destinations	Unassigned Number
All Other Controller Entry States	0
All Other Controller Exit States	0

Zone 3

Parameter	Value
Channel	3
MIDI Bank	3
MIDI Program	67
Low Key	C3
High Key	E4
Control Knob Function 1 Destination	7
Control Knob Function 1 Entry State	127
Control Knob Function 1 Exit State	127
All Other Controller Destinations	Unassigned Number
All Other Controller Entry States	0
All Other Controller Exit States	0

Zone 4

Parameter	Value
Channel	4
MIDI Bank	0
MIDI Program	23
Low Key	E1
High Key	B2
Control Knob Function 1 Destination	7
Control Knob Function 1 Entry State	127
Control Knob Function 1 Exit State	127
All Other Controller Destinations	Unassigned Number
All Other Controller Entry States	0
All Other Controller Exit States	0

5. Let's now set the MIDI receive channels on each of the Modules in our rig. Note that they will be same as the channels of their corresponding Zone:

Module	Channel
Module 1	1
Module 2	2
Module 3	3
Module 4	4

6. Finally, let's now save our newly-created Setup. Recall that the **Save** button is illuminated. To save our Setup, press the **Save** button once. The **Save** button LED will blink to indicate that a save operation is underway, and the User Bank LED will also be lit. The default save location will be the next available location in the Setup User Bank. If all

64 User Bank slots are taken, then the Setup is saved in the last slot in the User Bank, overwriting what was previously in that slot. If the current Setup is a Setup already in the User Bank, then the Setup is saved in its current Setup slot. At this point, you can rename the new Setup using the secondary alphanumeric functions of the Group Select and Sound Select buttons.

When the **Save** button LED is blinking (which means that you pressed Save, and a save operation is underway), pressing **Save** again will cause the system to save the current Setup to the indicated Group and Sound in the User Bank. If you want to save it to a different location in the User Bank, select the location via the Group Select and Sound Select buttons (or using the Value buttons) before pressing **Save** again.

Pressing any other button while the **Save** button is blinking will cancel the save operation.

Your Setup is now complete!

Other Tutorials

Connecting to Your Sound System

See *Connecting to Your Audio System on page 2-4.*

Connecting MIDI

See *Connecting MIDI on page 2-7.*

Managing Object Data

See *The "Save All?" Dialogue on page 9-7* and *The "Load All?" Dialogue on page 9-8.*

Updating Software

See *Update Software on page 10-2.*

Restoring Factory Defaults

There are two ways to restore factory defaults, both of which result in all user-created Objects being deleted. The first method is described in *The "Hard Reset?" Dialogue on page 9-7*. The second is described in *System Reset on page 10-3*.

CAUTION: RESTORING FACTORY DEFAULTS CANNOT BE UNDONE. BACK UP YOUR FILES BEFORE DOING SO BY FOLLOWING THE PROCEDURE IN *The "Save All?" Dialogue on page 9-7*.

Chapter 12
Troubleshooting

Maintenance

Aside from normal care in handling and use, your SP4 requires no regular maintenance. Clean with a soft cloth dampened with water. Never use abrasives or solvents as they may damage the unit's paint, markings, info strip and display lens. There are no batteries inside to replace—ever. Instead of volatile SRAM used in most other instruments, your SP4 uses nonvolatile EEPROM for storage, which retains information without power.

Common Problems

Below is a list of the most commonly encountered problems and diagnoses for each.

Power Problems

This is the normal power-up sequence:

1. The display backlight turns on.

2. "Loading..." appears on the display for a few seconds.

3. The unit enters Program mode with **Grand Piano 0** selected.

If nothing at all happens when you turn the power switch on, check if one of the following might be the issue:

The power converter is not plugged securely into the wall outlet.	Plug the power converter securely into the wall outlet.
The cord from power converter is not plugged securely into the SP4 DC power jack.	Plug the power converter securely into the SP4 DC power jack.

The power converter ratings does not match the required ratings for the SP4. The power converter specifications are: 15V DC, 1.0 amp, center pin positive, 5.5mm OD, 2.5mm ID coax type plug.	Obtain a compatible power converter.
The wall outlet, power strip, or extension cord is defective or damaged.	Use a different wall outlet, power strip, or extension cord.

If there's evidence of the unit receiving power, but operation is abnormal, check if one of the following might be the issue:

The power converter ratings does not match the required ratings for the SP4. The power converter specifications are: 15V DC, 1.0 amp, center pin positive, 5.5mm OD, 2.5mm ID coax type plug.	Obtain a compatible power converter.
The wall outlet voltage is below 90 volts due to overload.	Try a different outlet on a different circuit.
The power converter plug does not snugly fit into the DC power jack, causing it to wobble and provide intermittent power.	Obtain a compatible power convert.

Audio Problems

CAUTION: <u>DO NOT TROUBLE SHOOT AUDIO PROBLEMS USING HEADPHONES. ADDITIONALLY, ALWAYS BE AWARE OF THE VOLUME LEVELS ON THE SP4 AND ON THE CONNECTED AUDIO SYSTEM OR MIXER.</u>

NOTE: When diagnosing audio problems, set the SP4 to play its demo sequence rather then intermittently pressing keys. This will prevent any unexpectedly loud volume changes.

If there is no sound from your SP4, check if one of the following might be the issue:

The volume slider is turned down.	Slowly push the volume slider up.
The volume control on the audio system or mixer is turned down.	Slowly turn the volume control up.
The signal source selection on the audio system or mixer is incorrect.	Set the volume of the audio or mixer to the lowest level, select the correct signal source, and then slowly turn up the volume.
The audio cables are not securely plugged into the SP4, audio system, or mixer.	Set the volume of the audio or mixer to the lowest level, securely plus in the audio cables on both ends, and then slowly turn up the volume.
The audio cable is of an incorrect type.	Obtain and securely connect an audio cable of the correct type. The SP4 accepts both balanced (TS) and unbalanced (TRS) 1/4-inch audio cables.

If you can hear sound but it is low or distorted, check if one of the following might be the issue:

The audio cables are not securely plugged into the SP4, audio system, or mixer.	Set the volume of the audio system or mixer to the lowest level, securely plus in the audio cables on both ends, and then slowly turn up the volume.

A received MIDI volume message has specified a low volume.	Set the volume of the audio system or mixer to the lowest level. Disconnect all MIDI cables, set the Destination parameter in Global Mode to **Local** or **MIDI+Local**, and reset the volume level on the SP4. Finally, slowly turn up the volume level of the audio system or mixer.
The current Setup has another controller assigned to volume, and it is turned down.	Select a different Setup. Or change the problematic controller setting by editing the Setup in Edit Setup Mode.
The input to the audio system is set for low impedance instead of high impedance.	Set the volume of the audio or mixer to the lowest level, change the impedance setting, and then slowly turn up the volume of the audio system or mixer.
The input trim to the audio system or mixer is set too low.	Slowly turn up the trim.

MIDI Problems

If you are experiencing problems sending MIDI to an external module, check if one of the following might be the issue:

|	
The MIDI cable is not securely plugged in at both ends.	Securely plug in the MIDI cable at both ends.
The MIDI connections are wrong.	To send MIDI, plug the MIDI cable into the SP4's MIDI Out port and into the module's MIDI In port.
The MIDI cable is defective.	Obtain and securely connect a new MIDI cable.
The MIDI transmit channel does not match that of the receiving device.	Change the channel on either the SP4 or on the device such that the channels match.

If there are problems with the internal sound module receiving MIDI from an external device like a computer sequencer, check if one of the following might be the issue:

The MIDI transmit channel of transmitting device does not match that of the receiving Program or Zone on the SP4.	Change the channel on either the SP4 or on the computer such that the channels match.
The MIDI cable is not securely plugged in at both ends.	Securely plug in the MIDI cable at both ends.
The MIDI connections are wrong.	To receive MIDI, plug the MIDI cable into the SP4's MIDI In port and into the module's MIDI Out port.

Pedal Problems

Before you consult this section, be sure to read *Connecting Pedals on page 2-5*.

Switch Pedal Problems

If you are having problems with connecting or using a switch pedal, check if one of the following might be the issue:

• Sustain or Sostenato is stuck "on". Be sure the pedal is plugged in before switching on the power. Turn power off then on if necessary.

• The pedal is acting backward ("on" when up instead of down). Power cycle the unit making sure to NOT press on the pedal during startup.

• A dual pedal is not working correctly. A dual switch pedal must be wired as shown below. Any other wiring pattern will not work correctly.
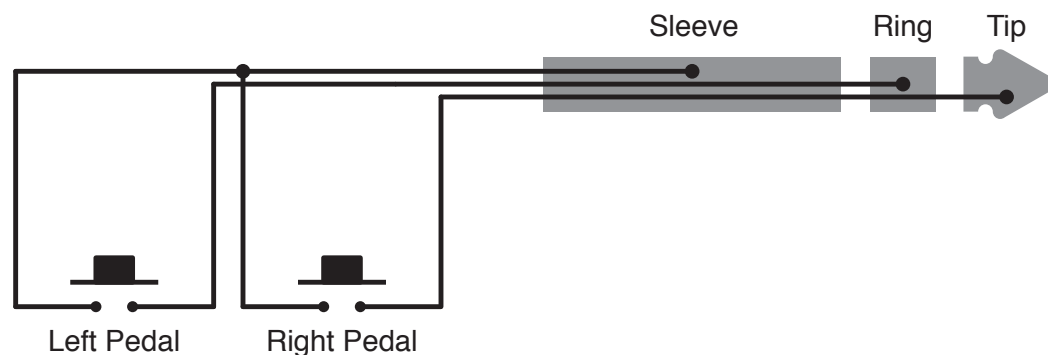
Control Pedal Problems

The control pedal must be wired to a single stereo 1/4-inch plug as follows:

- Wiper to Tip
- Top end of resistance element to Ring
- Bottom end of resistance element to Sleeve

These connections are shown schematically below:
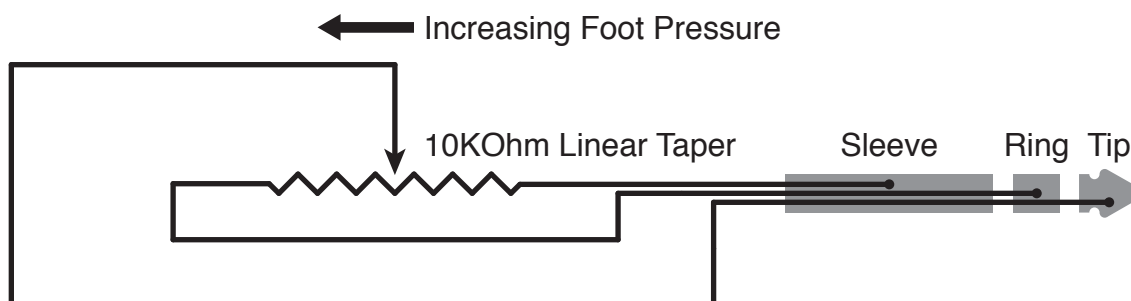
Use the Right Impedance, Taper, and Range

For best results, use a Kurzweil CC-1 control pedal, available from your dealer. The CC-1 meets all of the requirements described above at an economical price. A control pedal should have an impedance between 5,000 and 100,000 ohms. An impedance less than 5,000 may overload the reference voltage source in the SP4 and interfere with operation of other controls like the volume slider or control knob. An impedance more than 100,000 may result in electrically noisy operation, which may cause your SP4 to send MIDI controller messages constantly.

The taper of the control should be linear for easy, predictable control. Pedals designed for volume control typically have an exponential (or anti log) taper, which results in most of their range being concentrated in the upper half of pedal's path of travel.

Pedals may have a control range that is less than 100%. Make sure that when the pedal is in the fully down position, it's impedance is 0, and when it is in the fully up position, the impedance is at its maximum rating.

If None of the Above...

If your problem is not covered above, or none of the suggestions seems to work, first check back and review the relevant sections of this manual. Many difficulties are just programming problems caused by settings of Setup parameters. If you want to be sure that all of the factory defaults are in place, see *Restoring Factory Defaults on page 12-7*.

Also be sure to check out Kurzweil's website for additional SP4 information that may have been published since this manual was written: www.Kurzweil.com

Service Centers

Contact the nearest Young Chang office Kurzweil service representative. See *page iv* in the front matter of this manual for contact info.

Restoring Factory Defaults

There are two ways to restore factory defaults, both of which result in all user-created Objects being deleted. The first method is described in *The "Hard Reset?" Dialogue on page 9-7*. The second is described in *System Reset on page 10-3*.

CAUTION: RESTORING FACTORY DEFAULTS CANNOT BE UNDONE. BACK UP YOUR FILES BEFORE DOING SO BY FOLLOWING THE PROCEDURE IN *The "Save All?" Dialogue on page 9-7*.

Diagnostics

You will most likely not need to use the System Mode diagnostic operations in normal cases. These operations are mostly used at the factory and service centers by engineers for troubleshooting problems with hardware. But, in some cases you might be required to run these diagnostics for troubleshooting and diagnosing symptoms. In these cases, follow the direction of an authorized Kurzweil technician.

If None of the Above...

Appendix A
MIDI Implementation

Function		Transmitted	Recognized	Remarks
Basic Channel	Default	1	1	Memorized
	Changed	1–16	1–16	
Mode	Default			Use Multi-track mode (see *FX Select (FXSel) on page 9-4*) for multi-timbral applications
	Messages	Mode 3	Mode 3	
	Altered			
Note Number			0–127	
	True Voice	0–127	0–127	
Velocity	Note ON	O	O	
	Note OFF	O	O	
After Touch	Keys	X	X	
	Channels	X	O	
Pitch Bender		O	O	
Control Change		0–31 32–63 (LSB) 64–127	0–31 32–63 (LSB) 64–127	Controller assignments are programmable
Program Change		1–999	1–999	Standard and custom formats
	True #	0–127	0–127	
System Exclusive		O	O	
System Common	Song Pos.	X	X	
	Song Sel.	X	X	
	Tune	X	X	
System Real Time	Clock	X	X	
	Messages	X	X	
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		

Mode 1: Omni On, Poly	Mode 2: Omni On, Mono	O = Yes
Mode 3: Omni Off, Poly	Mode 4: Omni Off, Mono	X = No

Appendix B
Physical Specifications

Keyboard:	76-note, semi-weighted action with velocity sensitive adjustable keys
Display:	16 character LCD w/ front-panel contrast adjust
Polyphony:	64 Voice Polyphony, dynamically allocated
Multitimbral:	16 parts (one per MIDI channel)
Quick Split/Layer:	Easy access with adjustable relative volume
Factory Presets:	128 Programs, taken from the acclaimed PC3 sound set
Factory MIDI Setups:	128 factory setups, plus 128 user setup locations with 4 programmable zones for splits and layers
Effects:	Dozens of complex effect chains taken from the PC3
Controllers:	• Pitch wheel • Modulation wheel • 1 front panel knob • 1 stereo switch-pedal input (supports two pedals with Y connector) • 1 continuous control pedal input
Analog Outputs:	• Two 1/4" balanced TRS analog (24-bit DACs) • +21DBu maximum output • 400Ω balanced source impedance • 24-bit D-to-A converters
Headphones:	1 rear panel 1/4" headphone output 8 Vrms maximum output, 47Ω source impedence
MIDI:	In, Out
USB:	Complete MIDI functionality over USB User program/setup file transfer to/from PC/Mac Operating System updates from PC/Mac
Height:	3.4" (8.6 cm)
Depth:	11.4" (28.9 cm)
Length:	43.6" (110.8 cm)
Weight:	24 lb. (11 kg)
Power:	External 15VDC 1.0A power supply

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