

Chapter 2

Setup, Connections, and Controls

Setting Up the PC88

The PC88 is designed to be portable, and therefore doesn't come with its own stand. You can use a conventional keyboard stand that is strong enough to hold the unit's weight (about 55 pounds). Other methods of supporting it can be used, but make sure that the two ends are equally well-supported—don't just lay it on top of a chair in the middle. It's a good idea to use the stick-on rubber feet even if you are going to be putting the PC88 on a metal stand — you never know when you'll have to put it down on a table. Just make sure the feet don't get in the way of the stand's supports. A figure in Chapter 1 illustrates the recommended attachment points for the feet.

Connections

Power

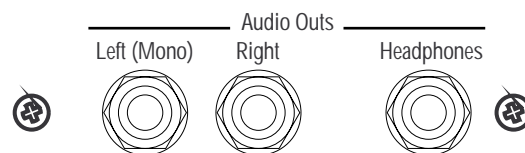
Power is supplied by an external AC power supply (it helps the balance and keeps the weight down, since you asked). Use only the unit supplied with your PC88, and make sure the power switch on the rear panel of the PC88 is off—the side with the white dot is out—before connecting the power supply.

The black box containing the transformer plugs into a wall socket or power strip, and the small plug on the end of the wire goes into the jack marked **9.5V~AC In** on the rear panel. A protruding plastic strain relief is next to the power socket — wrap the wire once around it before plugging it into the jack, and this will prevent damage should the cord ever be yanked. A figure in the "Setup" section of Chapter 1 shows how to do this.

If you are using the PC88 in a different country from the one you bought it in, make sure the power supply is the correct one for that country's AC power. Contact your dealer for information.

Audio

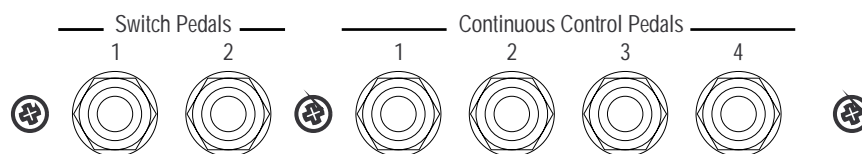
Audio connections are 1/4-inch, unbalanced, for use with a standard instrument amplifier or mixer. To use the PC88 with a hi-fi system, you will need cables with 1/4" jacks on one end, and RCA (phono) plugs on the other. Use only the **Left (Mono)** jack if you want to listen in mono — for example, if you have only a one-speaker instrument amplifier, or only a single mixer channel available. Use both jacks for stereo.



The headphone jack carries the same signal as the main outputs, and is useful for solo practicing or monitoring. It provides a stereo signal, using a standard 1/4-inch tip/ring/sleeve configuration. Plugging it in does *not* disconnect the main outputs.

Pedals

The PC88 has jacks for connecting up to four external control pedals (**Continuous Control Pedals**) and two foot switches (**Switch Pedals**). The control pedals are typically used for continuous functions like volume or stereo pan, while the switches are used for on/off operations like sustain, sostenuto, or to shift to the next setup. The action of every pedal is programmable within each zone: a pedal may have one function in one zone, and a totally different function — even a directly *opposite* function — in another zone.



There's no need to connect the pedals in any particular order — you can have any combination of pedals plugged in and active at any time.

The control pedals should be 10k Ω linear-taper potentiometers, with 1/4" tip/ring/sleeve plugs. These are available from Kurzweil/Young Chang (Model CC-1), as well as other manufacturers. The switch pedals use two-conductor 1/4" plugs. Either normally-on or normally-off switches can be used: the PC88 will sense what kind of switch is plugged into each jack when it powers up, and will set itself accordingly. Therefore, it's a good idea to have any switch pedals that you plan to use plugged in when you turn the power on. (*Don't press the pedal while you're turning the unit on, however, or you may end up with something that works upside-down.*) Three models of switch pedals are also available from Kurzweil/Young Chang: FS-1, a conventional pedal; KFP-1, a piano-style; and KFP-2M, a dual piano-style pedal.

The Internal Voices have default settings for many of the PC88's pedal controllers:

Controller	Default setting
Switch Pedal 1	Controller #64 ("Sustain")
Switch Pedal 2	Controller #66 ("Sostenuto")
Continuous Control Pedal 1	MIDI Controller #11 ("Expression")
Continuous Control Pedal 2	Controller #4 ("Foot Pedal")
Continuous Control Pedal 3	<i>None</i>
Continuous Control Pedal 4	<i>None</i>

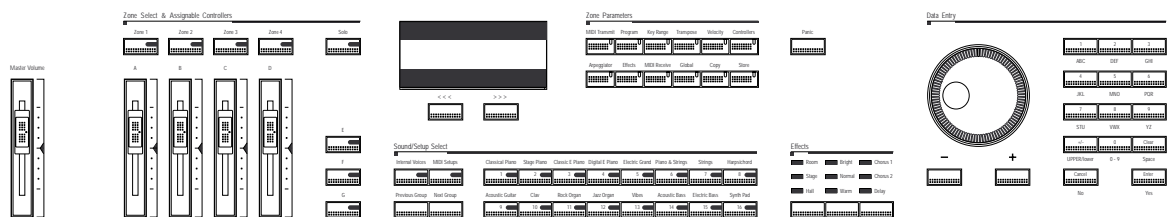
MIDI

The **MIDI In** jack is used when you are using the PC88 with another MIDI controller device, such as a keyboard, guitar, wind controller, or drum pad; or with a sequencer. Connect the MIDI Out of the device or sequencer to the MIDI In of the PC88. The PC88 can receive 16 separate channels of MIDI data through the MIDI In jack.

MIDI Out is used when the PC88 is acting as a controller for one or more other instruments, or for a sequencer. MIDI data being created by the PC88 is sent through this jack. The PC88 can send information on up to four MIDI channels simultaneously, depending on the configuration of the keyboard zones.

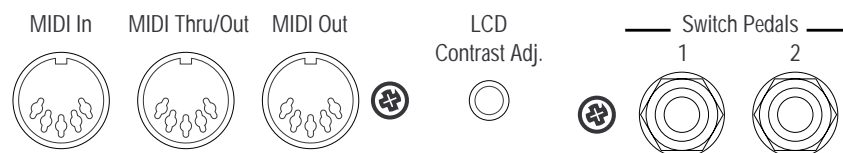
MIDI Thru/Out serves two functions, depending on the position of the recessed slide switch (**MIDI Select**) to the left of the MIDI In jack. In the **Out** position, the jack doubles as a second Out jack, and sends MIDI data being created by the PC88. Since you can't just split a MIDI line with a Y-cable, having a second Out jack makes it more convenient to hook up multiple instruments that are being driven directly from the PC88. In the **Thru** position, this jack sends MIDI data which is being sent *to* the PC88—echoing what appears at the **MIDI In** jack (without any delay)—but *not* data being generated by the PC88 itself. In this configuration, you can “daisy-chain” multiple MIDI instruments which are under the control of something else, like a sequencer, through the PC88. There is also a special “Merge” feature that combines these functions. We'll talk about it in Chapter 9.

Front Panel Controls



Display (LCD)

The LCD display is your “window” into the PC88. In two lines of text and numbers, it tells you what you need to know about the settings and functions of the instrument. You can adjust the contrast of the LCD to accommodate different playing positions, by using the small black knob on the back panel of the PC88. The illustration below shows the location of this knob (labelled **LCD Contrast Adj.**), between the MIDI jacks and the pedal jacks.



Cursor Buttons

Directly below the display are two buttons marked <<< and >>>. These are the cursor buttons. When you are making adjustments to parameters, these let you move among the parameters within a “menu”. Pressing the right or left button changes the display to show the next or previous parameter in the menu. The value of the parameter is then changed with the Alpha wheel or the keypad, or by using Intuitive Entry.

Sometimes there will be two parameters on the display at once, for example (as we’ve seen) when setting the key range of a zone. The cursor buttons will let you select which parameter to adjust.

The cursor buttons have a “repeat” characteristic — if you press and hold one down, it will scroll quickly through the list of parameters on the menu.

When the menu is long, such as when you are assigning MIDI controllers to the PC88’s physical controllers (wheels, sliders, etc.), or when you are editing effects, the cursor buttons have a “jump” feature: press both of them at the same time, and the display jumps to a parameter some distance down the list. We’ll deal with exactly how this works in the appropriate sections.

Sound/Setup Select

These two groups of buttons — four on the left, 16 on the right — are the principal ways to switch among sounds and configurations of the PC88.

The PC88 plays in one of two modes. In the **Internal Voices** mode, the instrument is a single-sound keyboard instrument that transmits on a single MIDI channel. The **MIDI Setups** (or just “Setups”) mode turns it into a four-part multi-timbral synth and controller, with independent MIDI transmission on four different channels. These two buttons select between the two modes. (When it comes to *receiving* MIDI data, the PC88 is capable of receiving multi-timbrally on 16 MIDI channels, regardless of which mode it is playing in.)

In the Internal Voices mode, the 16 numbered buttons select among 16 types of sounds. They are also labelled with instrument names, showing you the type of instrument that will be selected. Other groups contain different, but related instrument sounds. To get to them, you can press the **Next Group** or **Previous Group** buttons. If the current instrument is “Clavinet” (#9), pressing **Next Group** will call up “Stereo Clav” (#25), and pressing it again will call up “Super Clav” (#41). Each sound “family” contains a total of four variations. The groups are labelled A, B, C, and D, and these labels appear at the upper right of the display.

The PC88 remembers the group that your last selection of any instrument came from. Say, for example, you press **Classical Piano**, and then **Next Group** to hear Voice #16 “Class Piano 440”. The display shows “B01”, meaning you’re in group B, Voice 1. Then select another Voice in a different group — say #11, “Jazz Organ 1, A12”. The next time you select **Classical Piano**, it will remember that the Classical Piano Voice you last used was from group B, and it will call up “Class Piano 440”, not some other Classical Piano sound from another group. For your convenience, the PC88 even remembers your group selections across power cycles.

In Setup mode, the Select buttons work in a similar way, except that because all setups are user-programmable, there’s no direct correspondence between the names printed on the panel and any of the Setups. Furthermore, they do not remember the group that your last selection came from. There is room for 128 Setups in the PC88, and they are arranged in groups A through H, with the group letter at the *bottom left* of the display. Unlike Internal Voices, Setups in different groups that share a common number are not necessarily related.

Zone Buttons

Moving to the left of the display, immediately under the label **Zone Select and Assignable Controllers** are the four Zone buttons. These have several functions. They turn zones on and off, they select which zone will be “current” and thus have its parameters adjusted, and they select zones for soloing. The Zone buttons contain three-color LEDs. When the LED is green, the zone is on (active). When it is orange, it is muted. When it is red, it is being soloed, and when it is dark, the zone is off or inactive.

Remember that zones are only operative in MIDI Setup mode. In Internal Voices mode, only Zone 1 is used.

To select a zone for editing, press its button once. The number of the zone shows up on the display, showing that it’s the “current” Zone. If you are not in Zone Parameters mode, the zone number is displayed on the second line, next to the program name. If you are working on parameters, the zone number is on the first line. Next to it may be a character: if the zone is muted there will be a “-”, while if it is soloed, there will be a “*.”

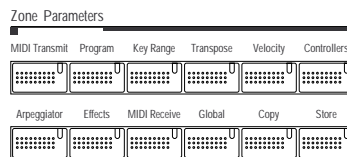
active:	muted :	soloed:
Zone: 1	Zone: 1-	Zone: 1*

Once a Zone is selected, its button acts as a mute/unmute toggle. Press it once and it turns orange, and mutes. Press it again, and it un-mutes, becoming active and turning green.

The **Solo** button to the right of the **Zone** buttons mutes all zones except the current one. The button of the zone being soloed will glow red.

Zone Parameters

Moving to the top of the panel, we find 12 buttons. The first row of six are for accessing parameters within each of the four zones of a Setup, while the ones in the bottom row are for dealing with Setup parameters, global settings, and memory functions. Each of these buttons opens up a list, or “menu” of parameters. Some of the menus are very short — as short as a single item — while others have several dozen parameters.



Chapters 4 and 5 have complete descriptions of using zones and zone parameters, so for now we’ll give a brief summary of these menus.

MIDI Transmit determines the MIDI channel the zone will send on, as well as the “destination” of the played data: whether it goes to the internal sounds and/or the MIDI Out jack. Also, the pitchbend range of the Zone’s destination channel is set here.

Program selects what voice, or program, will be used in the zone. It also lets you determine whether a MIDI program change will be sent when the setup is called up; whether a MIDI Bank Select message will be sent and what form it takes; and how program numbers and names will be displayed for the voice assigned to the zone.



Key Range sets the high and low limits for the zone. It also lets you set up “maps” for sending alternately-played notes to different zones. This is important when you are using the special “64-Note Poly” bank on the VGM board. It can also be used when you are driving multiple similar instruments and want to have them handle the same data, but in such a way that their polyphonic capabilities complement each other and add up.

Transpose changes the pitch of the zone up or down, up to 127 semitones.

Velocity opens a large menu with parameters relating to how the keyboard generates velocity information. You can adjust velocity scaling from none — the same velocity value is always sent — to three times normal, to three times normal but upside-down. You can also set the curve used for the scaling, the offset from normal, and minimum and maximum values.

Controllers opens the largest menu. These parameters determine how the PC88’s *physical* controllers — the wheels, sliders, pressure, pedals, and programmable buttons—work. In addition to specifying which *MIDI* controller (or other performance parameter, like pitchbend) is sent, this menu also determines for each controller scaling, curves, offsets, and the values that the controller will send — if any — when you enter or leave the setup.

The **Controllers** button has its own special “Intuitive Entry” mode, which we’ll explain a little later in this chapter.

The buttons on the second row are not Zone-specific, but are considered “Global”. Chapters 5 through 9 describe these buttons completely.

The first one is **Arpeggiator**. The PC88 has a sophisticated arpeggiator for live performance or sequencing or just fooling around. The menu includes controls for tempo, interval, note duration, and direction. Each Setup has its own Arpeggiator settings. See Chapter 6.

Effects lets you edit the on-board reverb, chorus, and delay. Each Setup has one set of Effects parameters associated with it. The effects are editable — see Chapter 7.

MIDI Receive turns on and off individual MIDI channels in the PC88, and also shows which program is assigned to each channel, when you're using an external sequencer. Chapter 8 discusses using a sequencer with the PC88.

The **Global** button's menu includes many parameters for both local and MIDI operation; they are detailed in Chapter 9. These include:

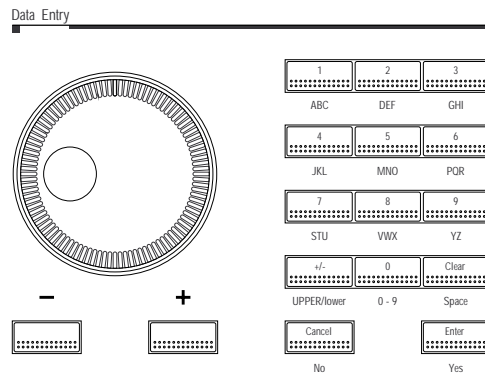
- Turning local control on and off for the entire instrument, which is very useful in a sequencer setup.
- Allowing synchronization to external clocks.
- Turning on and off the PC88's MIDI Clock generator.
- Adjusting the feel of the keyboard.
- Indicating whether or not you want effects to change when you change voices or Setups.
- Setting a parameter that tells the instrument to change Setups immediately whenever it receives an appropriate command, or to wait before changing until all of the keys being played are released.
- Using an external MIDI device to change the PC88's setups.
- Rerouting incoming MIDI data according to the channel and key limit parameters of the current Setup, or merging incoming MIDI data with generated data at the MIDI Out jack.
- Adjusting the master tuning of the PC88.
- Setting a transposition interval for received MIDI notes.
- Determining how Bank Select messages will be received by the PC88.
- Accepting or ignoring All Notes Off commands, which can be a problem with some external keyboards.
- Turning on and off the General MIDI mode in the PC88 (if the VGM board is present) and also in any other General MIDI modules connected to the PC88's MIDI output.
- Assigning device ID in multi-PC88 environments.
- Transmitting button presses as MIDI System Exclusive commands.
- Transmitting PC88 effects settings to a sequencer.
- Displaying the amount of user memory currently available.
- Performing a "hard reset", which returns the PC88 to its original factory state. Be careful with this: you will lose any Setups or any other edits that you've stored.
- Dumping all Setups in memory as System Exclusive data.
- Monitoring generated and incoming MIDI data with a built-in utility known as MIDIScope.

Copy allows you to duplicate groups of parameters from one zone to another (and sometimes even within a zone), so that you can quickly create zones with similar characteristics. It works in several modes: it will either copy all of a Zone's parameters, or only those in a specific subset. You can also use the "Clear" function at the end of each copy menu to copy information that is stored in Setup 128. This setup has default parameter information stored in it, though you can overwrite this setup with your own, creating your own "default" parameter settings. A full explanation is in Chapter 5.

Store is the button for saving Setups to internal memory. Press it once and use the Data Entry controls to select a location to store the Setup to, then press **Enter** to make it so. Also from this menu you can delete and rename Setups, and dump them over MIDI System Exclusive. See Chapter 5.

Data Entry

The Data Entry section is used to set the various parameters associated with a Voice or a Setup. It consists of three parts: the Alpha wheel, the decrement/increment buttons (- and +), and the numeric keypad.



- The Alpha Wheel is used to move rapidly through lists of voices and setups, to select them for playing or modification. It also sets parameter values when you are in Parameter mode. It has no markings of its own, but refers to what is showing in the display. You can move it either clockwise or counterclockwise without limit.
- The decrement/increment buttons complement the Alpha wheel by providing a quick way to make small adjustments, once the Alpha wheel has gotten you into the neighborhood of where you want to be. The buttons are auto-repeating: hold them down and they will continue to increment or decrement. In Parameter mode, they also have an “automatic reset” feature: press both simultaneously, and whatever parameter is showing on the display will return to its default setting.
- The numeric keypad is useful for when you know the exact number of the voice, setup, or parameter value you want. For example, if you know that you want to set a zone to transpose up four octaves (48 semitones), press the **Transpose** button, then enter the numbers **4** and **8** from the keypad. Then press **Enter**, and the display shows “Transposition: 48”. The “+/-” button is used to enter negative numbers. Use the “+/-” button any time before you press **Enter**: e.g., to enter -100, you can press +/-, **1**, **0**, **0**, **Enter**; or **1**, +/-, **0**, **0**, **Enter**; or **1**, **0**, **0**, +/-, **Enter**; etc.

The +/- button has a secondary use when entering program numbers with banks: it acts as a separator between the bank number and the program number, and puts a colon (“:”) in the display. More on this in Chapters 3 and 9.

If you make a mistake with the numeric keypad, press **Clear** and everything you’ve entered is erased. If you decide you don’t want to change the parameter or voice after all, press **Cancel** and the display goes back to whatever it was showing previously.

- The numeric keyboard is also an *alphabetical* keypad, and is used to name Setups. More on this in Chapter 5.
- The **Enter** and **Cancel** buttons act as “Yes” and “No” for when the display asks you a question. The **Enter** button is also used in Intuitive Entry mode.

Intuitive Entry

The PC88 includes a feature called “Intuitive Entry”. This has three modes: in one, when a parameter is being displayed, you can enter a value for it using a physical controller or key, thus avoiding the Alpha wheel and numeric keypad. In the second, you can avoid scrolling

through long lists of parameters to find the one you want to adjust. In the third, you can instantly select a MIDI Receive channel to audition and edit. (We'll refer to the more conventional way of getting around the instrument as "Direct Entry".)

Value setting

The "value setting" mode of Intuitive Entry lets you use any physical controller (including the keyboard) to adjust a parameter shown on the display. Press and hold down the **Enter** button (on the numeric keypad) and move any controller or play a note. The value of the parameter will change to reflect the position of the controller or the number of the note.

Here's an example. Press **Transpose**. With Direct Entry, you would move the Alpha wheel to set the value of this parameter. Press and hold **Enter**, and move one of the four controller sliders — it doesn't matter which. Watch the Transpose value in the display change. The slider covers the entire range from -127 to 127.

Here's another. Press **Key Range** (under **Zone Parameters**) to look at the key range of the current zone. Hold down the **Enter** button, and play a note. That note is now the low limit of the range. Press the right cursor (>>>) button, press and hold **Enter** again, and play another note. This sets the high limit. And one more example. Press **Controllers**. The display says "Wheel 1 Up/Ctrl Num: Pitch Up". Moving the Alpha wheel clockwise will scroll you through a dozen or so assorted functions, while moving it counter-clockwise will scroll down through 128 MIDI controllers. Getting to something at the other end of the list can be pretty time-consuming, so there's an alternative: press and hold **Enter**, grab a slider, and shove it to the bottom of its range. You're now at the beginning of the list: "None". If you'd like to be somewhere else in the list, move the slider accordingly.

At all times, the Alpha Wheel and + and – buttons are active, so if Intuitive Entry doesn't get you exactly where you want to go, you can make fine adjustments with them. Any continuous foot pedals can be used to perform Intuitive Entry, and so can the modulation and pitch wheels.

Parameter Selecting

The second way to use Intuitive Entry is used only when assigning physical controllers. Normally, when you press the **Controllers** button, the display shows "Wheel 1 Up", and you can now assign a MIDI command to the upper half of the pitch wheel. If you want to adjust a different physical controller, you have to use the cursor buttons to scroll through the entire menu of parameters for *each* controller: a half-dozen or so parameters for 17 physical controllers.

You can speed up the process by holding down the cursor button and letting it auto-repeat, but there's an even faster way: press and *hold* the **Controllers** button, and while you're holding, move the physical controller you want to work on. The display will jump to the first parameter for that controller. This works with *all* of the programmable sliders, buttons, wheels, pedals, and switch pedals, and it also works with keyboard pressure: hold the **Controllers** button, and press hard on any note. The display will jump to "MPressure" (mono pressure), and you can set its assignment.

MIDI Receive

The third Intuitive Entry mode is used when setting the MIDI Receive channels. Setting these channels is important when using the PC88 with a sequencer, and a complete explanation is in Chapter 8. To choose a channel quickly, either to inspect, audition, or edit, press and hold the **MIDI Receive** button, and then one of the numbered Voice buttons. The display will jump to the channel corresponding to the number of the Voice button.

Jump Editing

While we're on the subject of moving around the Controllers menu quickly, there's one more technique to discuss. If you want to adjust the same parameter (for example, Scale) in different physical controllers, there's another way to get where you want to go without scrolling the entire list. If you press *both* cursor buttons simultaneously, the display will jump to the same parameter for the *next* controller on the list. So if you are working on the offset for Slider A, as shown here:

```
Zone:2  Slider A
Ctrl Scale: 25 %
```

and you want to see what the offset on Slider B is set to, simultaneously press both cursor buttons (<<< and >>>) and the offset for Slider B shows on the display:

```
Zone:2  Slider B
Ctrl Scale: 110 %
```

Repeated double-pressings will take you through all of the physical controllers. What happens when you get to the end? It stops — but you can go immediately to the beginning of the list (Wheel 1 Up) by simply pressing the **Controllers** button.

Assignable Controllers, Buttons, and Wheels

The sliders underneath the zone buttons (labelled **A**, **B**, **C**, and **D**); the three buttons to the right of the sliders (labelled **E**, **F**, and **G**); and the two wheels at the far left of the keyboard are all assignable to different MIDI (and PC88) functions, just like the Pedals and Switch Pedals. The buttons can be configured as momentary (they only stay on when they are being pressed) or toggle (they alternate between two different states each time you press). They contain red LED's whose action conforms to their current configuration: the LED in a momentary only lights while you hold it, while the LED in a toggle will alternate on and off with each press.

The first wheel, which is most commonly used for pitchbend, can have different effects depending on which way you push it: up from the center resting place, or down. The second wheel has one continuous effect over its whole range.

The sliders, buttons, and wheels are all assignable on a per-zone basis, so not only can they do different things in different setups, they may also do different things *within* a setup. For example, a slider may send out Controller #7 (MIDI Volume) to one zone's MIDI channel, and at the same time send Controller #10 (Pan) to another zone's MIDI channel. Much more on this in Chapter 5.

Like the pedals, there are default settings for the assignable controllers that come with the factory Setups.

Controller	Default Setting
Wheel 1 Up	Pitchbend up (values above 64)
Wheel 1 Down	Pitchbend down (values below 64)
Wheel 2	Controller #1 (Modulation)
Slider A	Controller #91 (Reverb Depth)
Slider B	Controller #93 (Effects Depth)

Controller	Default Setting
Slider C	Controller #4 (Foot Pedal - same as Pedal 2)
Slider D	Controller #72 (Envelope Control)
Button E	Controller #71 (Sound Control 2)
Button F	<i>None</i>
Button G	Controller #119 (Arpeggiator Latch 1)

Master Volume

This slider is *not* programmable. It does exactly what you think it does: set the level for both the main outputs and the headphone output. It does *not* generate MIDI Volume commands or any other MIDI data.

Panic

Pressing the **Panic** button is the fastest way to get all sound, both within the PC88 and in any MIDI devices that it is connected to, to stop. It immediately releases all notes in the PC88, plus it sends the MIDI messages “All Notes Off” and “Reset All Controllers” on all 16 MIDI channels to the MIDI Out jack. If you hold the button down for a few seconds, it additionally sends out pitchbend resets (pitchbend value of 64), and note-off commands for every note on all 16 channels (that’s 2048 note-offs, in case you’re counting). **Panic** is your friend. It can be used to reset your entire MIDI setup to a known state, if you ever need to do that (which can happen pretty often with a complex setup). If you find yourself stuck in MIDI Purgatory, and notes that you don’t want are sounding from who knows where, the **Panic** button can even save your life (and your audience’s ears).

Effects

The three buttons in the **Effects** section allow you to switch among several combinations of effects. The first button selects the type of reverb: pressing it repeatedly toggles through **Room**, **Stage** and **Hall** reverbs, in order of increasing reverb time and level. The light indicates the current setting. Press the button yet again, and no light shines, indicating that reverb has been turned off. The second button controls the tone of the reverb: **Bright** emphasizes the high-frequency components of the reverb, for simulating a room with hard surfaces; **Normal** plays the reverb “flat”; and **Warm** emphasizes the low frequencies in the reverb, for simulating a room with soft surfaces, such as furniture or curtains. When the first button has shut the reverb off, none of the tone lights will be lit.

The third button selects the chorus or delay effect. It has four choices: **Chorus 1**, which imparts a two-voice chorus onto the sound; **Chorus 2**, a more complex four-voice chorus; **Delay**, which produces an echo effect; and off. The settings of the reverb and chorus/delay controls are independent of each other, and one can be used freely with or without the other. If you change the settings on an Internal Voice, the change is remembered, and the new settings will appear every time you call up that Internal Voice. Similarly, in Setup mode, the effects settings are automatically stored along with a Setup when you perform a Store operation. Besides these simple adjustments, there are many more ways to modify the effects in the PC88. See Chapter 7 for details.