KURZWEIL
Music Systems

THE PC88 MADE EASY

A Step by Step Guide

Includes 27 Different Tutorials Designed For Specific Applications
Plus Programming Tips, Tricks, and Shortcuts

by David Fox

Young Chang Distributors

Young Chang America, Inc.
PO Box 99995
Lakewood, WA 98499-0995
Tel: (253) 589-3200
Fax: (253) 984-0245
support@kurzweilmusicsystems.com
www.kurzweilmusicsystems.com

Young Chang Canada Corp.
3650 Victoria Park Ave. #105
Toronto, ONT
Canada M2H 3P7
Tel: (416) 492-9899
Fax: (416) 492-9299

YoungChang Akki Co., Europe GmbH
Industriering 45
D-41751 Viersen
Germany
Tel: 2162-4491
Fax: 2162-41744
www.kurzweil-europe.de
support@kurzweil-europe.de

Young Chang Akki, Co. Ltd.
16th Floor Dongwoo-Bldg No. 708-1
Yoksam-Dong, Kangnam-Gu
Seoul, Korea 135-080
Tel: 2-3451-3500
Fax: 2-3451-3596

PC88 Made Easy

PC88 Made Easy

This guide walks you step-by-step through a variety of typical programming applications you might use in the creation of Setups on the PC88.

The first part of this document reviews some of the basic concepts of the PC88 design and user interface, including editing shortcuts. The second part contains a series of step by step tutorials, each of which demonstrates a different function.

BASIC CONCEPTS & USER INTERFACE ISSUES

The Two Play Modes

The PC88 has two basic Play Modes - Internal Voices and MIDI Setups. You switch between these two modes using the Internal Voices and MIDI Setups buttons in the Sound/Setup Select area.

If you only need to play one Program at a time, use Internal Voices mode. (Typically a Program will be just one sound, but there are some Programs that have a couple of sounds layered together, such as Piano & Strings). The PC88 is always in Internal Voices mode when you first power it up.

If you have a regular PC88, then you have one bank of 64 Programs that you can access. These are most easily accessed by using the 16 Sound Select Buttons, which are labeled by Sound Category. Under each category, there are 4 variations, which you can select using the Next Group and Previous Group buttons.

You can also select a Program by typing its number on the numeric keypad and then pressing Enter. Appendix A in the manual lists all the Internal Voice programs and their numbers. In addition, once you are on a program, you can scroll through them in numeric order by using the alpha wheel or the + and - buttons under the wheel.

If you have a PC88MX, then you have additional banks of sounds. The banks are as follows:

Bank 0   Internal Voices
Bank 1   General MIDI
Bank 2   Expansion Voices
Bank 3   64 Note Polyphonic

You will need to know the bank numbers if you are sending the bank controller from an external MIDI device such as a sequencer, or if you switch banks from the numeric keypad, which we will discuss below. (Note that Bank 0 - the programs in the basic PC88, is referred to as the Internal Voices bank, which is not to be confused with Internal Voices mode. You can play programs from the other banks while in Internal Voices mode. But you are always playing just one program at a time in Internal Voices mode.)

MIDI Setups mode is used when you want to split or layer two or more Programs. You would also use it when you want to control any external MIDI modules or keyboards. MIDI Setups also allow you to program all of the sliders, wheels, pedals, buttons, etc. for specific applications.

PC88 Made Easy

MIDI Setups mode allows you to have up to 4 zones, with a different program on each zone. Therefore, the maximum number of programs you can split or layer from the keyboard is four. (But the instrument can still respond on all 16 MIDI channels from an external MIDI controller or sequencer.)

MIDI Setups mode and Internal Voices mode function identically, with only a few exceptions. You will always only have one zone in Internal Voices mode, since you are playing a single Program. (It is possible to start in Internal Voices mode and add zones, but when you go to save what you have done, you will have to save it as a Setup.)

User Interface Basics

The following is a review of the information covered in chapter 2 of the manual. If you read nothing else in the manual, you should go back and read that chapter.

The buttons on the front panel are divided into sections.

Sound/Setup Select -

We already mentioned how you can use these buttons to call up programs when in Internal Voices mode, but you can also use them for calling up Setups when in MIDI Setups mode. Notice that the 16 buttons are labeled with the numbers 1-16. By using these buttons along with the Previous Group and Next Group buttons, you have access to 16 different Setups at a time with only one button press. The 16 buttons can then be used to access the Setups as follows:

Group A Setups 1-16
Group B Setups 17-32
Group C Setups 33-48
etc.

There are a total of 128 locations for Setups, which gives you 8 possible groups (A-H).

1. Press the MIDI Setups button.

2. Press the #1 Sound Select button (also labeled Classical Piano). If you have just turned on the instrument, the top line of the display should say S001 A Piano Trio. If it doesn't, press the Previous Group button repeatedly until it does. You have now called up Setup #1. Notice that the bottom line says A01, showing you that you are in Group A on the #1 Sound Select button. Following the A01, it will show a number and a Program name. This shows you the name of the Program in the currently selected Zone (more on this later).

3. Press the Next Group button. The top line of the display now shows S017 FluidGtr & Vibe (Setup #17) and the bottom line shows B01. This tells you that you have moved to Group B but you are still on the #1 Sound Select button.

4. Press the #2 Sound Select button (also labeled Stage Piano). Now the display shows S018 Click and Trio on the top line and B02 on the bottom line. Notice that you have

stayed in the same group - you are still in Group B but are now on the #2 Sound Select button.

So what's so great about all of this anyway? Lets say that you are creating several Setups of your own and you need to switch between them quickly in a performance. You can save them all within the same group, saving them between Setups #65-80 (a PC88 has preset Setups from 1-32 and a PC88MX has preset Setups from 1-64). Once you go to MIDI Setups mode, you can use the Next Group buttons to get to Group E. Now, you can switch between any of your Setups (up to 16) with just a single button press by using the Sound Select buttons!

There is an IMPORTANT DIFFERENCE between MIDI Setups mode and Internal Voices mode. When you are in MIDI Setups mode, pressing the Sound Select buttons will always call up the appropriate Setup within the currently Selected Group - the group won't change unless you press the Previous or Next Group buttons, or use the Data Entry section to go to a Setup in a different Group. But when you are in Internal Voices mode, each Sound Select Button remembers whichever group it was last on.

1. Press the Internal Voices button.

2. Press the Sound Select #1 Button. Press the Previous Group button until the top line of the display says 1: Internal Voice A01.

3. Press the Sound Select #2 Button. Press the Previous or Next Group Button until the display says 1: Internal Voice B02.

4. Press the Sound Select #1 Button again. Notice that it goes back to Group A. If you go back to Sound Select #2, you will see it jumps back to Group B.

This feature is useful because it allows you to choose your favorite program out of a group and be able to call it up with a single button press when in Internal Voices mode. This is remembered even after you turn the PC88 off.

Data Entry -

This section is very simple and should be familiar to anyone who has used other electronic instruments as well as automated teller machines (ATMs). The alpha wheel allows you to scroll through values quickly. The "+" and "-" buttons let you increment or decrement by single values, and the numeric keypad lets you enter a specific value. It is also used for naming Setups. You always need to press the Enter button when using the numeric keypad to register the value (except when using the naming function, as described in Tutorial number 1).

Zone Parameters -

Almost all of the editing features of the PC88 are accessed through this section. Under each button is a series of parameters, which you access using the << and >> buttons under the display. You then use the Data Entry section to change the value of the currently displayed parameter.

PC88 Made Easy

1. Press the MIDI Transmit Button. The display shows that you are on the MIDI Channel parameter.

2. Press the >> button. You are now on the Destination parameter, which by default is set to Local+MIDI.

3. Press the "-" button under the alpha wheel. The value changes to MIDI. Rotate the wheel clockwise. It changes back to Local+MIDI.

Notice that there is an underscore below the letter L in the display. This shows that the parameter is highlighted. Usually there is only one parameter in the display at a time, but sometimes there are two.

4. Press the KeyRange button. There are two parameters in the display - Low Note and High Note. Notice the underscore under the C. Press the >> button and you will see the underscore move under the G.

Zone Select -

The four zone select buttons have two functions. When playing a Setup, they allow you to mute and unmute zones. When you are editing a Setup, they allow you to switch between zones for editing. Since the display has only two lines, there is only enough room to show the value of 1 zone at a time.

1. Press the MIDI Setups button, then press 1 on the numeric keypad, then press Enter. You have called up Setup 001 A Piano Trio. On the bottom line of the display, after A01, it should say 1:Stage Piano 440. If it doesn't, press the Zone 1 button once and you will see this info. This shows you the Program that is on zone 1.

2. Notice that the Zone 1 and Zone 2 buttons are green. This tells you the Setup has 2 zones. If you play the keyboard, you will hear Piano on the right side and Bass+Ride Cymbal on the left.

3. Press the Zone 1 button. It now turns orange. This means that zone is muted. If you play the keyboard, the right side makes no sound. Press Zone 1 and the button turns green again and you will hear the piano.

4. Press the Zone 2 button. The bottom line of the display now says A01 2:Leg Bass &Ride, showing you the Program in zone 2.

An important point that can lead to confusion: If a specific zone is NOT currently in the display, pressing that Zone Select button will bring up that zone in the display. But if the Zone is already in the display, then pressing the same numbered Zone Select button will mute it.

5. Press the MIDI Transmit button. The top line now shows Zone 2   0:061. When you are editing any parameter the top line always shows you the current zone, as well as the bank and program number of the program assigned to that zone (in this case, it is the Internal Voices bank 0, Program 61 - Legato Bass & Ride. The bottom line says MIDI Channel:02. showing you zone 2 is assigned to channel 2.

6. Press the Zone 1 button. It shows you that zone 1 has program 17 from the Internal Voices bank and is assigned to channel 1.

7. Press the Zone 1 button again. Notice that the Zone 1 button turns orange - the zone is muted. The display also shows a "-" after the zone number in the display. The mute function works both when playing and editing a Setup. This can be useful when you are creating your Setups - you can temporarily mute a zone to hear the others. Press the Zone 1 button again to unmute the zone.

8. Press the Solo button. The Zone 1 button turns red, showing that zone is soloed. If you play the keyboard you will only hear the piano. Press the Zone 2 button. It switches to red and the Zone 1 button to green, soloing the bass sound.

Effects -

This section is very simple. You can select an effects setting for each Program by pressing the appropriate buttons. Pressing a button repeatedly toggles through the values of that button. Additional effects parameters are available through the Effects menu in the Zone parameters section. Those will be covered in Tutorial #12.

There are two basic parameters for Reverb - Room Type and Quality. The first button choose the Room Type and the second button chooses the Quality. If you press the Room Type button enough times so that you turn it off, the Quality button will also turn off (since no reverb is selected). The third button lets you choose Chorus or Delay. You can have both Reverb and Chorus/Delay or either one alone.

In Internal Voices mode, each program can have its own effects settings. No special saving procedure is necessary - the PC88 simply remembers the last setting you chose for that particular program. This applies to all the programs, including the ones on the VGM board.

1. Press the Internal Voices button, then 1 on the numeric keypad, then Enter, to choose the Stage Piano program. Assuming you have not changed the default effects settings, they will be set to Stage Bright Reverb. If not, switch the values so that they are set to Stage Bright.

2. Press the Quality button so that it switches from Bright to Normal.

3. Press 3 on the numeric keypad and then Enter, to choose the Digital E. Piano program. The effects switch to Room Bright Reverb plus Chorus 1.

4. Press 1 on the numeric keypad, then Enter. Notice it returns to Stage Normal, instead of Stage Bright, its original setting.

In MIDI Setups mode, things are slightly more complicated. In order for the effects settings to be remembered, you must go through the Store process (which will be covered in the tutorial section).

Even more important, since there is only one effects processor in the basic PC88, plus one more on the VGM board, you can only have one or two different effects settings in a setup. No matter how many zones you have, any zones which use a program from the Internal Voices bank will have the same settings, and any zones which use a program

PC88 Made Easy

from any of the VGM banks will have the same settings. (But the two Internal Voices bank effects and the VGM bank effects can be entirely different).

Editing Shortcuts -

Following are few tricks to speed up editing of various parameters:

Setting Note Values:

For any parameter whose value is a note, hold Enter and strike the note on the keyboard that you want and the parameter will switch to that note.

Turning a parameter Off or setting it to None:

Typing 0 and pressing Enter will change most parameters to a value of Off or None.

To quickly edit a specific controller:

Each physical controller (sliders, wheels, etc.) has a number of parameters, and there are 17 different physical controllers. All of those parameters are under the same menu, so that is a lot of parameters to scroll through!! If you hold the Controllers button and move a specific controller, the PC88 will jump to the first parameter for that controller. For example, hold Controllers and move Slider A. The display jumps to Slider A Ctrl Num.

Pressing the << and >> buttons simultaneously will jump to the same parameter for the next controller in the list. After following the previous example, press both those buttons and you jump to Slider B Ctrl Num.

Jumping to a specific channel in the MIDI Receive menu:

Holding MIDI Receive and pressing one of the 16 Sound Select buttons will jump to that numbered MIDI channel.

Switching Banks when calling up a Program (in Internal Voices mode or in the Program Menu when editing a Setup):

Type the bank number, then the "+/-" button, then the program number, then press Enter.

Using the Copy Function

As you go through the tutorials below, you will find examples of many different things you can do on the PC88. When you start to create your own Setups, you may find that you want two or more zones to have the same types of control oriented functions, with each zone playing a different sound. One way to speed up the creation of your Setups is

to copy parameters from one zone to another or even from one Setup to another. The PC88 makes it easy to do this.

Details on using the Copy function can be found at the end of this document, after all the tutorials.

TUTORIALS

Intro

These tutorials have been designed to start simply and increase in complexity. To avoid a great deal of duplication, later tutorials will refer to steps from previous tutorials.

Editing from the Default Setup:

All of the tutorials start from the Setup 127, the Default Setup. One thing you want to be careful of - if you start from an existing Setup and make changes, some of the parameters from that original Setup may be set to do specific things, which will affect what you are trying to do. A good example of this is Setup #1. It has the "F" button assigned to a GoTo Program function in zone 1. If you edit Setup #1 and change the program for zone 1 under the Program button, it will appear that your change doesn't work correctly after you save your Setup. What is happening is that the "F" button control function overrides the setting of the Program parameter.

For this reason, it is usually easier to start with the Default Setup. If you do start with one of the preset Setups, please be sure to look in Appendix E of the manual to see the controller assignments for that Setup.

Another thing to be aware of - whenever you call up a Setup, the PC88 copies all of the parameter values into an edit buffer. Any changes you make are made in that edit buffer, and the changes don't go into memory until you Store that Setup. If no Setup exists at a specific location, then nothing is copied into the edit buffer, and so the data in the edit buffer is whatever was there from the last real Setup.

For example, lets say you start with a PC88 set to factory defaults (no user Setups saved in memory). Now you call up Setup 1. All the parameters from Setups 1 are placed in the edit buffer. Next you call up Setup #67. But there is no Setup #67 yet in the instrument, so the display says "Not Found". Since nothing existed there, the values from Setup #1 are still in the edit buffer and if you start editing those values will be there unless you change them. As you can imagine, this can lead to confusion.

So again, the best way to create your own Setup is to either start with Setup 127, or start with another existing Setup if you know how its parameters are set and want to make use of those settings.

There are actually two possible Setups you can start with. Setup 127 Default Setup has some of the controllers set to default settings for all 4 zones. For example, the Switch Pedal 1 is set to Sustain and the wheels are set to Mod Wheel and Pitch Bend. Other controllers are unassigned. Setup 128 A Clear Setup has ALL of the controllers unassigned. Typically it is easier to start with Setup 127, since you will normally want those basic controllers set to their default values.

The following tutorials assume you have a switch pedal plugged into the Switch Pedal 1 jack (for Sustain). Some of these tutorials also require that you have a second switch pedal plugged in to the Switch Pedal 2 jack. If you don't have a second pedal, you can

still follow the example, using the "E", "F", and "G" buttons in the Assignable Controllers area to do the same thing.

PC88 Made Easy

1. Layering Two or More Programs

To play two or more programs, you must create a Setup with a zone for each program, and each zone set to a different MIDI channel.

1. Press the MIDI Setups button, then type 127, then press Enter on the numeric keypad.

2. Press the MIDI Transmit button. If the display doesn't show Zone 1, press the Zone 1 button. Press 1, then Enter. The button will now be lit green and the display will show it is set to channel 1.

3. Press the Program button. Choose the Program you want for the first zone. You can select it by using the alpha wheel, the + and - buttons, or the numeric keypad. (The programs and their numbers are listed in Appendices A & B in the manual.) Or you can use the Sound Select and Next/Previous Group buttons, as described at the beginning of this document.

4. Step 3 will allow you to choose any program from the Internal Voice bank. But if you have the VGM board and want to choose a program from one of the VGM banks, then you need to switch banks. There are two ways to do this.

If you know exactly which program you want, then the fastest way is to type the bank number, followed by the "+/-" button, followed by the program number, then Enter. (The bank numbers were listed at the beginning of this document.)

OR

If you want to scroll through the programs in a bank, press the << button to get to the Bank parameter. Use the alpha wheel to choose the bank you want. Then press the >> button to get back to the Program parameter and use the alpha wheel to scroll through the programs in that bank.

5. Now that you have chosen your first sound, you will choose your layered sound. Press the MIDI Transmit button, then press the Zone 2 button. Notice that the channel is set to Off and the Zone 2 button is unlit. Set it to channel 2. (You can actually choose any channel but 1, since 1 is being used by zone 1.) The Zone 2 button turns green, showing that it is active.

6. Press the Program button. Repeat steps 3 or 4 to assign a program for your second layer. Play the keyboard. You should hear both sounds together. Notice that the sustain pedal works for both layers.

7. If you want to add a third or fourth layer, just repeat steps 5 and 6. (Just make sure to choose a different MIDI channel for each zone.)

8. That's it!. Now all you have to do is Name and Store your Setup. Press Store. The display says "Replace Setup 127?". Press the >> button so that the display says "Rename Setup 127?". Press Enter. Now you are in the naming routine.

You will see an underline cursor under the first character ("D"). Press the <<< or >>> soft buttons to move the cursor. Press a button on the numeric keypad one or more times

to enter a character above the cursor. The characters that correspond to the alphanumeric buttons are labeled under each button. If the character that appears is not the one you want, press the button again. For example, pressing 1 once will choose an "A". Pressing it again will choose "B", and one more time will choose "C". Press the +/- button on the alphanumeric pad to switch between upper and lower case characters. Press 0 one or more times to enter the numerals 0 through 9. Press CLEAR (on the alphanumeric keypad) to erase the selected character without moving any other characters. To insert a space, press the "E" button in the Assignable Controllers section. To delete a character press the "F" button, and to move the cursor instantly to the end of the name in the display, press the "G" button.

In addition to letter and number characters there are numerous other characters you can choose. For example, if you layered piano and strings, you might want to name your Setup "Piano & Strings". You can choose these characters by scrolling with the alpha wheel or the + and - buttons. At the end of this document, is a list of all the characters and the order in which they appear.

Once you have the name the way you want it, press Enter.

9. The PC88 now jumps back to the Store dialog. The display will read "Replace Setup 127?". You don't want to save over the preset Setup 127, since you will want to have it available as a template to start from. So choose a different number. If you haven't saved anything yet, you will find empty locations between 33 and 125 if you have a PC88 or 65 and 125 if you have a PC88MX. If you are on a blank location, the display will change to say "Save Setup xx?" (xx is the number you have chosen).

Now press Enter. Congratulations - you have created and stored your first Setup!

A programming note: The steps above take the approach of editing all the parameters in one zone, then going to the next zone and editing the parameters for that zone. But you can also work by editing the same parameter for all zones, then going to the next parameter and editing that for all zones. For instance, you could go to the MIDI Transmit page and set the MIDI channel for each zone (by pressing the Zone Select buttons, then go to the Program parameter and choose the programs in each zone. Either way of working is just as valid - it all depends on how you want to work! All of the tutorials here use the approach of setting all the parameters for one zone at a time, to help minimize confusion. Just remember to always check the zone number in the display so you are aware of which zone you are editing.

2. Splitting Two or More Programs

1. Go through steps 1-4 in tutorial #1.

2. Press the Key Range button. The display will show the key range for zone 1, from C-1 to G9. (C4 is middle C on the keyboard.) You are going to make zone 1 be the right side of the split, so you need to change the lowest note for this zone. The cursor is already under the Low Note parameter. So, simply press and hold the Enter button, then strike the key on the keyboard that you want to be the lowest note for the right side of the split. The display will change to show that note.

3. Go through steps 5 and 6 in tutorial #1 to create the second part of your split.

4. Press the Key Range button. Since zone 2 is the left side of your split, you need to change the high note so that it doesn't overlap with zone 1. Press the >> to move the cursor to the High Note parameter. Press and hold the Enter button, then strike the note on the keyboard that is one note lower than the note you chose for the lowest note in zone 1. Play the keyboard. You should hear the two sounds split at the notes you chose.

5. Notice that if you press the sustain pedal when playing both sides of the split, both sides sustain. Although this might be fine in some circumstances, often you won't want this. For example, if you create a piano and bass split, you will probably want the piano part to sustain, but not the bass.

Hold the Controllers button and step on the sustain pedal. The display jumps to show Zone:2 SwitchPdl1, Sw Type:Momentary. Press the >> to get to the On Control parameter for Switch Pedal 1. Currently it is set to Sustain. Press 0, then Enter to set it to None. Now play the keyboard and notice how the sound in zone 1 will sustain but the sound in zone 2 does not.

6. Go through steps 8 and 9 in tutorial #1 to name and save your Setup.

You can easily add zones 3 and 4 using the same methods. Each zone can be set to any range of notes, so you can have various zones layered while they are split with other zones. Or create a 3 or 4 way split. Or overlap the zones only partially.

3. Assigning Sliders for Volume in Different Zones

1. Go through steps 1-4 in tutorial #1.

2. Hold the Controllers button and move Slider A. The display now shows Zone:1 Slider A, Ctrl Num:None. Press 7, then Enter to assign Slider A to Volume. (Controller #7 is MIDI Volume. For a complete list of all the MIDI controllers, see Appendix F in the manual.)

3. Go through steps 5 and 6 in tutorial #1 to create a second zone.

4. Hold the Controllers button and move Slider B. The display now shows Zone:2 Slider B, Ctrl Num:None. Press 7, then Enter to assign Slider B to Volume. Play the keyboard and move the two sliders. You can control the volume of each zone independently.

5. Go through steps 8 and 9 in tutorial #1 to name and save your Setup.

Of course, you can use the C and D sliders to control volumes on the 3rd and 4th zone in a Setup. We have already created a template Setup, #16 Volume Sliders, which does this. So though we normally suggest you start with Setup 127 when making your own Setups, you can start with this one and just change the programs to the ones you need for a quick way to create a Setup.. However, it is good to try making your own from scratch at least once to see how it is done.

4. Setting Initial Volume Levels for Different Zones

Let's say that you want to create a setup with piano and strings layered but you want the strings to be at much lower volume than the piano, and you need to have the volume levels set to specific amounts when you call up the Setup. You can use entry values to set initial volume levels.

1. Go through steps 1-4 of tutorial #3, assigning a piano program to zone 1 and a string program to zone 2.

2. Press the >> button four times. Since you are still on zone 2, the display should read Zone:2 Slider B, Entry Value:None. Set the value to 95.

3. Press the Zone 1 button. Hold the Controllers Button and move Slider A. Press the >> button four times. The display should now read Zone:1 Slider A, Entry Value:None. Set the value to 127.

4. Go through steps 8 and 9 in tutorial #1 to name and save your Setup.

5. Now go to a different Setup, then call up your saved Setup again. Play the keyboard. Notice that the strings are quieter than the piano. Since the two sliders are assigned to volume on the two different MIDI channels, they each send a volume message with the Entry value (127 on channel 1 and 95 on channel 2) as soon as you call up the Setup. If you subsequently move the slider, it will send volume messages.

An IMPORTANT point to understand when using Entry values:

Lets say that your B slider happens to be all the way up when you call up the Setup you just made. Volume is now at 95 on channel 2. Now you want to use the slider to fade the strings out. If you move the slider, you wouldn't want it to suddenly jump to the current value; since the slider is all the way up (set to 127), it would jump to 126 the moment you moved the slider down and the volume would suddenly get louder!

To avoid this problem, the PC88 is designed so that once you set an Entry value, the slider won't become active until you pass the point of the Entry value. So as you move the slider down, nothing will happen until you reach 95 and at that point, it will follow the slider as you bring it down, thereby creating a smooth fade out.

Here's an extra tip - let's say that you want to have a piano & strings Setups like the one described above, but you don't want to hear the strings when you call up the Setup. Instead, you want to bring them in later with a slider. To do this, you could set the Entry value for zone 2 to 0. Now let's assume the slider is all the way down when you first call up the Setup. Remember that the slider must go past the Entry value before it becomes active. So the Entry value is 0 and the current position of the slider is also at 0. When you move the slider up, it goes to 1, not 0, and therefore nothing happens as you move the slider up. So you would have to move the slider up slightly, then back down so that it goes to 0, then the next time you move it up the slider will be active.

To avoid having to move the slider up , down, and up again, set the Entry value to a very low number other than 0, such as 5. The value is so low that you won't hear the strings, but as you push up the slider the first time, it will go past 5 and become active.

5. Returning Volume Levels to Full Values when Exiting a Setup

OK, so now you have created a Setup with the sliders set to control volume. Let's say that you are performing a song and you have faded out one or more zones and you go to a new Setup. You play the keyboard but don't hear the sounds on those zones!

Keep in mind that all controller information is channel specific. Once a MIDI channel received a message for a controller (like Volume with a value of 0), that MIDI channel stays at that same amount until it either gets a new value of that controller, or it gets the Reset All Controllers message (this is Controller 123, and is sent when you press the Panic button).

To avoid this problem, you can use Exit values.

1. Call up the Setup you created in tutorial #4.

2. Hold the Controllers button and move Slider A. If the display doesn't show Zone:1, press the zone 1 button. Press the >> button 5 times. The display should now read Zone:1 Slider A, Exit Value:None. Set the value to 127.

3. Hold the Controllers button and move Slider B. Press the zone 2 button. Press the >> button 5 times. The display should now read Zone:2 Slider B, Exit Value:None. Set the value to 127.

4. Resave your Setup by pressing the Store button. (You can save it back to the same location.)

Now when you leave this Setup, the volume on channels 1 and 2 returns to the full amount, no matter where you have moved the sliders.

Using Exit values is always a good idea when assigning volume to controllers, but it can have many other uses as well. For example, it could be used to turn off the arpeggiator, or return panning to center, etc.

6. Adjusting Relative Volumes with One Slider

So far we have only shown assigning a controller to one zone. But there is no reason that you can't use one controller to affect two or more zones. Let's say that you want to create a Setup with three layered zones - Piano, Electric Piano, & Strings. Furthermore, let's say you need to control the Piano and Electric Piano volumes separately, but you want to have the Strings volume controlled with the same slider you use to control the Electric Piano. In addition, you need the Strings to always be quieter than the Electric Piano.

1. Follow tutorial #1 to create a 3 zone, layered Setup, with Piano in zone 1, Electric Piano in zone 2, and Strings in zone 3.

2. Hold the Controllers button and move Slider A. If the display is not on zone 1, press the Zone 1 button. The display now shows Zone:1 Slider A, Ctrl Num:None. Press 7, then Enter to assign Slider A to Volume.

3. Press the Zone 2 button Hold the Controllers button and move Slider B. The display now shows Zone:1 Slider B, Ctrl Num:None. Press 7, then Enter to assign Slider B to Volume.

4. Press the Zone 3 button. Press 7, then Enter to assign Slider B to Volume. Play the keyboard and move the two sliders. Notice that Slider B controls the volume on both zones 2 and 3. But the strings are still as loud as the electric piano.

5(a). Press the >> button twice. The display now shows Zone:3 Slider B, Ctrl Offset:0. Press the +/- button, then 37, then Enter. The Offset will now be set to -37.

The Offset parameter will subtract (or add if the number is positive) a specific amount to the normal value of the slider. So when the slider is all the way up, the value is 127-37=90. So as you move the slider up and down, the strings are always 37 less in volume than the electric piano.

As you move the slider down to the normal 37 position, the volume level for the strings would be 37-37=0. What happens when you move the slider lower? MIDI can only send values between 0 and 127, so once the value reaches 0, the slider doesn't send any additional messages as you move it lower.

5(b). There is a second way to accomplish the same thing, although the end results will be slightly different.

You should still be on the Offset parameter for Zone 3. Set it back to 0 so there is no Offset, and press the << button once. The display now shows Zone:3 Slider B, Ctrl Scale:100%. Press 71, then Enter.

The Scale parameter applies a percentage to the normal slider value. So if you move the slider all the way up, the value will be 127 x .71=90.17 (since MIDI only send integer values this will be rounded to 90). So when the slider is all the way up, it is sending the same value as the example above using Offset.

So how are the two methods different? The Offset method will keep a fixed amount of value between the two zones whereas the Scale method will give you a sliding amount of difference, based on the percentage. If you move the slider to the halfway point, the Offset method would give you 64-37=27 and the Scale method would give you 64 x .71=45.44 (sent as 45). And if you move the slider to the 1/4 point, the Offset method would give you 32-37=-5 (sent as 0) and the Scale method would give you 32 x .71=22.72 (sent as 22 - values to the right of the decimal point are truncated, not rounded up).

So which method is better? It all depends on what you need and how you want the Setup to sound. Try creating two different Setups, using the two different methods. Then play and move the sliders and see which one sounds better to you. Try using different amounts of Offset and Scale to see what works best.

Don't forget to name and save your Setups!

7. Crossfading Zones

A nice musical effect is to be able to smoothly fade from one sound into another. You can easily do this with a single slider (or other continuous controller).

1. Follow tutorial #1 to create a 2 zone, layered Setup. To best demonstrate the crossfade effect, you should pick two sustaining sounds for the two zones, such as strings and organ, or two different sounding organs. If you have the VGM board in your unit, try using two similar orchestral sounds, like Oboe and English Horn, or Recorder and Pan Flute.

2. Hold the Controllers button and move Slider A. If the display is not on zone 1, press the Zone 1 button. The display now shows Zone:1 Slider A, Ctrl Num:None. Press 7, then Enter to assign Slider A to Volume.

3. Press the >> button once. Notice that Scale is set to 100%. Press >> again. Notice that Offset is set to 0. Press >> again. Set the Curve to Sin+.

4. Press the Zone 2 button. Press the << button three times so that you are back to the Ctrl Num parameter. Set this zone to Volume, just like zone 1.

5. Press the >> button. Press the +/- button, then 100, then Enter to set the Scale to -100%.

6. Press the >> button. Set the Offset to 127.

7. Press the >> button. Set the Curve to Cos+. Hold some notes on the keyboard the keyboard and move the slider up and down. You should hear one sound fading into the other.

8. Name and save your Setup.

OK, so what is happening? Zone 1 works like normal - moving the slider up sends volume values from 0 up to 127. But in zone 2, the slider starts off at 127 (because of the offset) and then decreases in value to 0 as you move the slider up (because of the negative 100 percent scale).

What about the curve parameters? They change what values are sent as you move the slider from the very bottom to the very top. With a Linear Curve (essentially no curve), the values change in even spacing as you move the slider up. With a Sine+ Curve, the values are spaced close together when you first start to move the slider up, then are gradually spaced farther apart after the halfway point. A Cosine+ Curve works the opposite - the values change slowly when you start moving the slider and then change faster after you reach the midpoint.

So why not use a Linear Curve in the crossfade? It is beyond the scope of this tutorial to detail dB issues involved when you layer sounds, or to cover how instruments respond to MIDI volume in dB terms. The bottom line is that if you use Linear curves, the total amount of amplitude for both zones will be less when the slider is halfway than when it is all the way up or down. By setting zone 1 to Sine+ and zone 2 to Cosine+, you will have a smoother volume transition and the amplitude at the midpoint will be about the

same level as when the slider is all the way up or down. Try setting both zones to Linear and hold notes while you move the slider, and compare that to using the Sine+ and Cosine+ curves. You should be able to hear a difference.

8. Velocity Switching

You can use how hard you strike the key to switch between zones. This is usually most effective if you have programs that have samples of the same instrument at different velocity levels. The PC88 doesn't have programs which are like this, so you would most likely use this technique when controlling an external module. But the following example demonstrates the technique with internal PC88 sounds.

1. Create a Setup with two zones, following tutorial #1. Assign Program #44 Marimba to zone 1 and #60 Metal marimba to zone 2.

2. Press the Velocity button. If you are not on zone 1, press the Zone 1 button. Press the >> button 3 times. The minimum velocity for this zone is 1. Press the >> button again. Change the maximum velocity to 80. Press the Solo button so you hear only zone 1. Play the keyboard with varying degrees of force. The marimba gets louder as you strike harder until you reach a velocity of 80, then it does not play at all.

3. Press the Zone 2 button. The maximum velocity is set to 127. Press the << button to go back to the Vel Min parameter. Set it to 81. Play the keyboard with varying degrees of force. Notice you hear no sound until you reach a velocity of 81, then zone 2 continues to get louder as you play up to 127. Press the Solo button again to hear both zones. Play the keyboard to hear the switching between the two zones.

Another useful application is to add a zone with velocity. You could create a 2 zone layered Setup. For one zone, you leave it to play through all velocities. But for the second zone, you change the MinVel parameter so that zone only kicks in above a certain velocity. Now when you play the keyboard, you hear one zone or two, depending on how hard you strike the keys. This is great for adding a little extra kick to a sound, if you add some type of short percussive program for the second zone. You may also want to set the volume for that zone lower than the first zone (as described in tutorial #4) so that the effect of adding the second zone is more subtle.

9. Switching from One Setup to Another With a Pedal

If you need to switch between Setups very quickly in performance, it can be useful to do this with a switch pedal. To do the following tutorial, you will need a switch pedal plugged into the Switch Pedal 2 jack in the PC88. (You could use Switch Pedal 1, but then you wouldn't be able to use it for Sustain.)

1. Create a Setup with one or more zones, following tutorial #1.

2. Hold the Controllers button and step on the pedal connected to the Switch Pedal 2 jack. The display will read Zone:1 SwitchPdl 2, SW Type: Momentary. If the display shows a different Zone, that is OK. Only one zone is needed to accomplish what you want to do, and it can be any zone, as long as the zone is active.

3a. Press the >> button, so that you are on the OnCtrl parameter. Press 137, then Enter to select GoTo Setup for the value.

In addition to the 128 MIDI controller messages, there are a number of special functions that can be assigned to a physical controller. They are listed on pages 5-13 & 5-14 of the manual. You can scroll up to them with the alpha wheel, or enter specific numbers (documented in the manual) to go directly to them.

4a. Press the >> button to get to the On Value parameter. Choose a Setup number that you want to jump to from this Setup. Enter that number as the value for this parameter.

3b-4b. Another option is to use the Setup Increment function instead of the GoTo Setup. In this case, you would type 135, then Enter when on the On Ctrl parameter, then set On Value to 127. This option will cause the PC88 to select the next higher numbered Setup, when you Step on the pedal. You could also use another pedal and assign it to Setup Decrement. Then the two pedals would allow you to step through the setups in ascending or descending order. (But of course, you would need to assign the pedals to these values in each Setup.)

5. Name & Save your Setup. It is important you save your Setup before testing the pedal, since stepping on the pedal will cause you to leave the current Setup and if it isn't saved, you will have to program it again. Now step on the pedal. You should see the PC88 jump to the Setup that you have chosen.

Instead of using a pedal, you could accomplish the same thing assigning the GoTo Setup to the E, F, or G controller buttons, but of course, then you have to take your fingers off the keys.

10. Switching from One Program to Another with a Pedal

If you have created a multiple zone Setup and only want to change a single program, you can use the GoTo Program function instead of using the GoTo Setup function. This can be useful if you don't want to make a bunch of extra Setups. It is also great for switching back and forth between two programs while keeping the other zones the same. This tutorial will be set up so that you can switch back and forth.

The limitation for this tutorial is that the program that you switch to must be in the same bank as the program you are switching from.

1. Create a multiple zone Setup, following tutorial #1. For the purposes of this tutorial, make sure that the program that you want to switch from is in the Internal Voices Bank. (The programs in the other zones can be in any bank.) Also for the purposes of this tutorial, we will assume you will use zone 1 as the zone that will switch programs. You will need to remember the program number of the program you choose for zone 1 - you will type in that number in step 6.

2. Hold the Controllers button and step on the pedal connected to the Switch Pedal 2 jack. If you are not on zone 1, press the Zone 1 button. The display will now read Zone:1 SwitchPdl 2, SW Type: Momentary. Use the alpha wheel to switch the value to Toggle.

The difference between Momentary and Toggle is: A Momentary switch is On while you press it and Off when you let go (like a typical sustain pedal). A Toggle Switch stays On when you press and let go and then turns Off when you press again (like a typical power switch).

3. Press the >> button. Press 134, then Enter to choose GoTo Program for the On Ctrl.

4. Press the >> button. Enter the program number of the program you want to switch to. It must be a program in the current bank (the Internal Voices bank for this tutorial).

5. Press the >> button. Notice that the OffCtrl value is set to GoTo Program (the same as On Ctrl). Although the On Ctrl and Off Ctrl parameters can be set to send different messages, you would normally expect them to send the same control message (but with different values for On and Off). For this reason, whenever you set the On Ctrl parameter, it also sets the Off Ctrl to the same thing. So if you want a different value for Off Ctrl, you must set it after setting the On Ctrl parameter. We will see an example of this in the next tutorial.

6. Press the >> button. Enter the number of the program that you originally assigned for zone 1 (the same number you set with the Program parameter).

7. Name and Save your Setup. Now play the setup, then step on the pedal. You should hear the sound from zone 1 switch to your second sound. Step on the pedal and play again. You should hear the original zone 1 sound again.

11. Switching Banks & Programs with a Pedal

A limitation of the GoTo Program function described in the previous tutorial is that it only sends a program change message, and not the bank controller. So what if you want to switch between programs in two different banks. The following tutorial provides a solution for this.

1. Create a multiple zone Setup, following tutorial #1. For the purposes of this tutorial, we will assume you will use zone 1 as the zone that will switch programs.

2. Hold the Controllers button and step on the pedal connected to the Switch Pedal 2 jack. If you are not on zone 1, press the Zone 1 button. The display will now read Zone:1 SwitchPdl 2, SW Type: Momentary. Unlike the previous tutorial, we will leave this set on Momentary.

3. Press the >> button. Press 32, then Enter. The On Controller parameter is now set to controller #32, the bank controller.

4. Press the >> button. Decide which program you want to switch to, making sure that it is in a different bank than the program you previously chose for zone 1. Enter the bank number of the bank your new program is in (the bank numbers were documented at the beginning of this document). The ON Value is now set to the bank number.

5. Press the >> button. Press, 134, then Enter. The Off Controller parameter is now set to GoTo Program.

6. Press the >> button. Enter the number of the program you want to switch to. The Off Value is now set to that program number.

7. Name and Save your Setup. Step on the pedal and release it. Zone 1 should switch to the sound you have chosen.

So what is happening? When you step on the pedal it sends the bank change command; when you let go, it sends the program change command, allowing you to switch to any program from any bank.

The only limitation of this method is that you can only switch in one direction with a single controller - you can't use one pedal to switch back and forth between two different programs. But you could always assign another controller to do the same thing to switch back, or even to a different program. For instance, you could use the E and F controller buttons, with E set to switch to a new sound and F set to switch back to the original sound.

12. Customizing the Effects Settings

This tutorial will explore customizing the effects parameters beyond the buttons available on the front panel Effects section. This tutorial is designed for the PC88MX, since it shows using both the Internal and VGM effects processors. If you have a regular PC88, you can still follow this tutorial, but simply ignore the steps that refer to zone 3.

1. Create a three zone layered Setup, following tutorial #1. In zone 1, for the Program, select #44 Marimba from the Internal Voices Bank. In zone 2, for the Program, select #60 Metal Marimba from the Internal Voices Bank. In zone 3, for the Program, select #4 Electric Piano 1 from the GM Bank.

2. If zone 1 is not currently showing in the display, press the Zone 1 button. Now, using the buttons in the Effects section, select Room for the Reverb Room Type and Bright for the Reverb Quality.

3. Press the Zone 3 button. Using the buttons in the Effects section, turn off the Reverb and select Chorus 1.

4. Press the Zone 1 button again. Notice that the buttons switch to show Room Bright for the Reverb, with No Chorus. Press the Zone 2 button. The effects settings stay the same.

It is important to understand that there are two separate effects processors in the PC88MX. (If you have a regular PC88, you have only one effects processor). These effects processors are completely independent and function only for specific programs. The Internal Effects processor controls all the sounds from the Internal Voices Bank. the VGM Effects processor controls all the sounds from the GM, Expansion Voices, and 64 Note Poly banks.

This also means that ALL programs controlled by a specific effects processor will use the same effects. So if you have two zones in your setup using the programs in the Internal Voices bank, making a change to the effects in one zone will actually be changing them for both zones. That is why when you switched from zone 1 to zone 2 in this setup, the effects didn't change, but switching from zone 3 to zone 1 did show a change.

5. Press the Effects button in the Zone Parameters section. The display now shows Zone:2 0:060, IntFx: RoomBright. Notice that the display shows the same values you selected from the dedicated effects buttons. Making any changes there will affect the display, and vice versa. Press the Quality button once to change from Bright to Normal. Notice that the display has changed to show RoomNormal. Move the alpha wheel one click to the right. The display now shows RoomNormal+Ch1. Notice that the Chorus 1 button has now lit up. Move the wheel back one click so it is again set to RoomNormal.

6. Press the Zone 3 button. Notice that the display still says RoomNormal but the effects buttons show no reverb and Chorus 1.

The reason that the display and the buttons don't match is that the parameter we are looking at in the display is for the INTERNAL effects, but this zone is playing a program from the GM bank, which would use the VGM effects. Press the Chorus button to select Chorus 2, and notice that the display still does not change.

7. To hear the effect changes better, it will be easier to temporarily mute the VGM effect while you edit the Internal effect. Press the Zone 3 button. Since Zone 3 was already selected, the second button press mutes the zone and the light turns orange. Play the keyboard and you will only hear the Marimba and Metal Marimba patches.

8. Although you can use the buttons in the effects section to quickly call up basic effects settings, you have additional control available within the Zone parameters.

Press the Zone 1 button. Press the >> button. The display changes to show Int Rev Wet. This is the wet/dry mix for the reverb. Try changing the values from low to high, using the alpha wheel, and play the keyboard to hear the difference. After playing with it, set this parameter to 85.

9. Press the >> button. The display now shows Int Rev Time. This sets the overall decay time of the reverb. Again, use the alpha wheel to change the values and play the keyboard to hear the difference. After playing with it, set this parameter to 70. For more on how this parameter works, please see page 7-2 in the manual.

10. Now we will edit the Chorus effect in Zone 3. Press the Zone 3 button twice. The first button press selects the zone and the second one unmutes it. The button is green again. Now we will want to mute the other two zones so we can hear the Electric Piano clearly. But instead of going through all the button presses needed to select those zones and mute them, an easier way is to solo the current zone. Press the Solo button. The Zone 3 button now turns red, showing that it is the only zone you will hear.

11. Press the >> button three times. The display now shows the VGMFx parameter. Notice it is set to Chorus 2, which is what we had selected for this zone, in the Effects section.

12. The VGM effects have an identical set of parameters to those available for the Internal effects. Press the >> button 3 times. You will pass by the VGM Rev Wet and VGM Rev Time. Since we have no reverb on this zone, we won't be using those parameters. The display now shows VGM Eff Wet. This controls the wet/dry mix of the chorus and reverb. Try changing the values from low to high, using the alpha wheel, and play the keyboard to hear the difference. After playing with it, set this parameter to 75.

13. Press the >> button again. This parameter is VGM Eff Delay, and controls the time of the Delay effect. Since we are using Chorus, changing this parameter won't do anything. Press the Solo button. All of the Zones are now heard if you play the keyboard.

14. Name and Save this Setup.

13. Transposing a Zone with a Button

Let's say that you need to be able to play a song in two different keys (maybe you have two different singers for your band) and you have only learned how to play the song in one key. You can use a button to transpose the keyboard so that you can play the same notes but hear it transposed to a different key.

1. Create a single zone Setup, following tutorial #1.

2. Hold the Controllers button and press the E controller button. The display now shows. Zone:1 Button E, SwType: Toggle. Press the >> button. Press 141, then Enter to set the On Ctrl to Transpose Up. If you would prefer to transpose down, the press 142, then Enter to select Transpose Down.

3. Press the >> button. Set the On Value for the number of semi-tones you want to transpose up (or down). For example, if you want to transpose up a minor 3rd, you would set it to 3.

4. Press the >> button. Move the alpha wheel 1 click clockwise to set the Off Ctrl to Transpose Down. (If you originally chose Transpose Down in step 2, then set Off Ctrl to Transpose Up.)

5. Press the >> button. Set the Off value to the same amount you chose for the On Value.

6. Name and Save your Setup. Now play the keyboard, then press the E button and play the same notes again. You will hear the keyboard transposed in the direction and amount that you chose. Pressing the E button will return the keyboard to no transposition.

Keep in mind that if you use this technique on a Setup with more than 1 zone, you will have to program each zone for the same transposition, if you want them all to transpose.

You may have noticed that there is also a button marked Transpose in the Zone Parameter section. If you simply want a zone to always be transposed by a specific amount (for example, to have one zone an octave higher than another zone), then it is much simpler to use the Transpose button instead of programming a controller. But if you need the ability to switch back and forth between transposition and no transposition, the method described above is the way to do it.

Also, you can combine the two methods. For example, you could create a Setup with one zone transposed up an octave from another zone using the Transpose button, then use controller method to move both zones by a minor 3rd.

14. Panning Zones Hard Left & Right

If you are using the PC88 in a recording studio or playing live and have the need to run different sounds out of different outputs, then you need to be able to pan individual zones hard right or hard left. To follow this tutorial, you will need to have both outputs of the PC88 plugged into a mixing board or stereo amp. If using a mixing board, make sure that the two channels are panned hard left and right on the board or you won't hear the separation.

1. Create a Piano and Bass split Setup, following tutorial #2. Choose a piano program for zone 1 and a bass program for zone 2. If zone 1 is not in the display, press the Zone 1 button.

2. Hold the Controllers button and press the G controller button. The display now shows Zone:1, Button G, SwType: Toggle. Press the >> button. Press 10, then Enter to set the On Ctrl to Pan (MIDI controller #10).

3. Press the >> button. Press 127, then Enter to set the On Value to 127, which will pan the piano sound hard right. (If you play the piano now, you won't hear it panned yet, but don't worry.)

4. Press the >> button twice. Press 64, then Enter to set the Off Value to 64, which will set the pan back to center.

5. Press the >> button. Set the Entry State parameter to On.

6. Press the >> button. Set the Exit State parameter to Off.

7. Press the Zone 2 button. Now repeat steps 2-6 of this tutorial for zone 2, but in Step 3, set the On value to 0, so that the bass will be panned hard left.

8. Name and Save your Setup. Now press the G button and play. You should hear the piano on the right and the bass on the left. Press the G button again. Both zones return to center.

9. Select a different Setup, then go back to your panned Setup. Notice that the G button is lights up when you select the Setup. This is accomplished by using the Entry State parameter. Chose another Setup. Notice that the G button is no longer lit. This is accomplished by using the Exit State parameter.

The Entry and Exit State parameters are very useful for when you want to assign a controller to send a specific value of something when you select a Setup without having to touch that controller (they work similar to the Entry and Exit value parameters for continuous controllers).

You can set a controller to turn On or Off when you select the setup and when you leave that setup. If the Entry or Exit State is set to None, then the controller remains as it was when you select or leave the Setup. For example, if we left the Exit State to None in this Setup, then the G button would remain turned On when we left this Setup.

PC88 Made Easy

This Setup was designed so that simply by calling it up, the zones would be panned the way we wanted, but when we leave the Setup, panning is returned to normal. This way, other Setups which use the same MIDI channels won't be panned. Of course, you might want to have all of your Setups panned in the same manner. But by using the Exit State or Exit Value parameters, you can ensure you don't have any unexpected surprises when you select a different Setup.

15. Using the Arpeggiator

One often overlooked feature of the PC88 is the arpeggiator. This can be a lot of fun to play with - you can get many interesting and unusual effects. Basically, an arpeggiator takes notes that you play and repeats them in a pattern. Typically, you might use it to arpeggiate chords that you play, but it can have other uses such as playing percussion patterns.

This tutorial will be a bit different from the others - instead of creating a specific arpeggiator effect, we will experiment with various parameters and hear the different results.

You can use the Arpeggiator in both the Internal Voices and MIDI Setups mode. We will start in Internal Voices mode, but if you find a specific set of parameter values that you like as you explore through the tutorial, you can simply press the Store button to save the settings as a single zone Setup.

1. Start in Internal voices and call up any sound that you want to work with. To best hear the effects of the arpeggiator, you might want to start with a program that has a percussive attack, such as piano, marimba, guitar, etc.

2. Press the Arpeggiator button. Turn the Arp Active parameter On. Play a chord on the keyboard. You should hear the notes arpeggiated. If you hear nothing at all, go to the Global Menu and check to make sure the Clock parameter is set to Internal. If you hear notes but they aren't arpeggiated, press the >> three times to make sure Zone Enable is On and once more to make sure Latch Mode is set to Keys.

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

Hold the sustain pedal and let go of the keys. Notice that even though the notes ring out like they would when you press the sustain pedal, the arpeggiation stops. In order for the arpeggiator to work, the keys must be held down, or otherwise latched (we will cover various latching methods in the next tutorial).

Now turn the Arp Active parameter back to Off.

3. Hold the Controllers button and press the "F" controllers button. Set the Switch Type to Toggle. Press the >> button, then 116, then Enter. The PC88 uses MIDI controller 116 to turn the arpeggiator on and off. Press the >> button and set the On Value to 64. Press the >> button twice and set the Off Value to 0. Since a Switch controllers has only two states (On or Off), any value between 0 and 63 is considered Off and and any value between 64 and 127 is On. Now if you turn the button on andstrike the keys, you will hear arpeggiation. If you turn the button off, then you will just hear the notes you played. Leave the button turned on.

4. As long as we are programming the controllers, we will set something else that we will use later. Hold the Controllers button, strike any key and press down. The display will

PC88 Made Easy

change to show Zone:1 Mpressure, Ctrl Num: None. The MPressure (Mono Pressure) controller is also referred to as aftertouch. After you strike a key, as you press down on the key, a pressure strip senses how hard you are pressing and generates controller data. Aftertouch is similar to the pitch wheel, in that it functions like a spring - it returns to 0 as you let go of the key. Like the sliders, wheels, and continuous control pedals, you can assign any MIDI controller number to aftertouch. However typically, aftertouch is assigned to Pressure, which is a separate MIDI message. Press 130, then Enter to assign Pressure to the MPressure controller.

One final thing to understand: There are actually two different types of aftertouch - Mono Pressure and Poly Pressure. Mono Pressure has a single strip running across the keyboard, so pressing down on any note will generate controller info that will affect ALL the notes played on that MIDI channel. Poly Pressure has a separate sensor for each key so pressing down on a key only affects that key. The PC88 uses Mono Pressure.

5. Press the Arpeggiator button, then press the >> button once to get to the Key Range display and >> once more so that the cursor is on the High Note parameter. Hold Enter and strike Middle C to set the High Note to C4. Now play a chord in the bass and a melody in the treble. Notice that any notes up to C4 are arpeggiated but all notes above that are played as normal. The Key Range parameter lets you set a range of notes which will be affected by the arpeggiator while others can be played regularly.

Hold Enter and strike the top note on the PC88 to put the arpeggiator back to playing across the keyboard.

6. Press the >> button. You are now on the Zone Enable parameter. This allows you to have some zones in your Setup which are arpeggiated while other zones play normally. Several of the preset Setups utilize this parameter. For example, Setup 3 Rhythm Pad has an arpeggiated Marimba layered with Electric Piano and Strings that do not arpeggiate.

7. Press the >> button. The next parameter is Latch Mode, which we will cover in Tutorial #16.

8. Press the >> button. The Play Order parameter lets you determine how the notes are arpeggiated. The current setting should be Played, which is the default. As we noticed before, the notes arpeggiate in the order in which you hold them down. Try changing this parameter to each of its possible values and play the keyboard to hear the difference. It should be obvious how most of the possibilities work, but for definition of the various values, see pages 6-3 & 6-4 of the manual.

9. Press the >> button. You can set the beat subdivision for the arpeggiated notes. This is based on Tempo, which is measured in Beats Per Minute. So if your clock is set to 120 BPM and you set the Beats to 8th notes, you will hear the equivalent of 240 arpeggiated notes in one minute.

10. Press the >> Button. You can set the Tempo for the arpeggiation here. However, more control is possible. Hold the Controllers Button and move Slider D. Press 131, then Enter to assign Tempo for the slider. (You might want to check the Scale, Offset, and Curve parameters for Slider to make sure they are at their defaults of 100%, 0, and Linear).

When you call up a Setup, the initial tempo will normally be set to the value you set in the Tempo parameter. However, if you have a controller (such as a slider) assigned to Tempo AND you set an Entry value for that slider, that Entry value will override the Tempo setting in the Arpeggiator menu. If you do use an Entry value for a controller assigned to Tempo, you will notice that two numbers are displayed. The first number will be a value between 0 and 127, while the second number will be the actual BPM value (between 20 and 300 BPM).

A final note - the Tempo parameter only applies as long as the Clock parameter in the Global menu is set to Internal. If you set it to External, it will follow the tempo of any clock messages detected at the MIDI IN port. If no clock is detected, there will be no arpeggiation (no sound will be heard when you press the keys).

11. Press the Arpeggiator button, then press >> seven times to return to Tempo, and once again to go to Duration. This lets you set the duration of each note being played by the arpeggiator. Try setting different values to hear the difference. At 100%, it is completely legato. The lower you set the number, the more staccato the notes are played.

12. Press the >> button. The Velocity Mode parameter determines what velocities are used to create the notes. The current setting should be Played, which is the default. As we noticed before, the notes get softer or louder in the arpeggio depending on how hard you strike the keys. Try setting this parameter to different values to see the difference. If it is set to Fixed, then a specific velocity is used for all notes, determined by the Fixed Vel parameter (the next parameter, accessed with the >> button). If it is set to Last, then all of the arpeggiated notes use the velocity of the last note you strike. Try playing a 3 note chord softly, then striking a fourth note hard - all of the notes will now be loud. If you then restrike just that one note softly, all the notes are soft.

Setting the value to Pressure means the velocities will be controlled by aftertouch. As you push down on any key, the velocities will be come louder. As with Last, pushing down on any one key will affect all the notes. (This setting will only work if the MPressure controller is assigned to Pressure, which we did in step 4.)

The final value is Ctrl 117, which allows you to control the velocities from a MIDI controller. This is covered in tutorial #17.

13. Press >> twice to get to the Note Shift parameter. This parameter and the following two parameters are used in conjunction with each other. Note Shift will take the notes that you play and transpose them up or down. Each time the arpeggio pattern is repeated, the notes will transpose by the amount you set. Set the Note Shift to 2, then play a chord. The notes will arpeggiate, then transpose up a whole step and repeat the pattern, then transpose up a whole step again and repeat the pattern.

Press the >> button. The next parameter, Shift Limit will determine how far the PC88 will keep shifting from the original pitches. Set the Shift Limit to 12 and play the keys again. Notice that the pattern will shift up in whole steps till it reaches an octave transposition, then the pattern starts shifting down in whole steps till it reaches the original notes you played, then starts shifting up again.

Press the >> button. The Limit Option parameter determines what happens once the arpeggiator reaches the Limit. With the default value of Unipolar, it shifts up and down, as you have seen. Try setting this to different values and listen to the end results. Complete descriptions of all these values are found in the manual on page 6-5.

These three parameters allow you to do some pretty wild things with the arpeggiator. The best thing to do is just experiment with different settings. When you find something you like, you can save it as a Setup.

14. Press the >> button. If you turn the last parameter, Glissando, to On, then the arpeggiator will not only play the notes you strike, it will also play all the notes in between the notes you strike.

In addition to making regular arpeggios with pitched instruments, you can get interesting effects with by using the arpeggiator with drum and percussion programs. The PC88 itself has somewhat limited abilities in this area since you can't edit the drum programs, but if you use the PC88 to control an external sound module in which you can edit the sounds, you can create many interesting patterns.

The key to this is to create programs that have no sample assigned to specific notes. That way, by including those notes in your arpeggiated pattern, you can get the equivalent of rests, to create more varied rhythmic patterns. You can actually demonstrate this on the PC88 itself (if you have the VGM board), using the Latin Percussion program (#63 in the Expansion Voices bank). This program was designed so that playing certain patterns of keys would create specific rhythms. You can use the arpeggiator to repeat that pattern over and over while you hold the notes instead of having to play them. For example if you set the Play Order to Up and you hold all the notes in a C major scale from C4 to C5, you will hear the Latin Tumbao pattern. These patterns are documented in the manual on page C-5.

You may want to go through the various parameters we have described to create an arpeggiator setting you want to work with. Then Name and Save this Setup - we will be using it as a starting point for the next few tutorials.

16. Using the Various Arpeggiator Latch Modes

The Latch Mode parameter allows you great variation in deciding which notes that you play should be used (latched) by the arpeggiator. In the previous tutorial, Latch Mode was set to Keys, so that the arpeggiator simply latched any note you pressed and held it only as long as the key was held down. But there are many other possibilities.

1. Start with the Setup you created in the last tutorial. Hold the Controllers button and press the "G" controllers button. Make sure the Switch Type is set to Toggle. Press the >> button. If the button is not already set to 119 Arp Latch1, assign it to that controller. Press the >> button and set the On Value to 64. Press the >> button twice and set the Off Value to 0. Make sure the button is turned Off (the button itself is not lit).

2. Press the Arpeggiator button. Press the >> button 4 times to get to the Latch Mode parameter. Change the value to Overplay. Play some notes on the keyboard. Notice they do not arpeggiate. Now hold some notes and press the G button. The notes start arpeggiating. Let go of the keys. They still continue to arpeggiate. Play some more notes. Notice they are not added to the arpeggio. When you use Overplay mode, only the notes held when the switch is turned on will be arpeggiated.

3. Turn the G button Off. Change the value of the Latch Mode to Arpeg. Hold some notes on the keyboard, and turn the button on. Let go of the keys. So far, it works identically to Overplay mode. Now press another key. Notice that the note is added to the arpeggio. Let go of the key. The new note is removed from the arpeggio, but the other notes continue to play.

4. Turn the G button Off. Change the value of the Latch Mode to Add. Hold some notes on the keyboard, and turn the button on. Let go of the keys. Again, so far it works identically to Overplay mode. Now press another key. As with Arpeg mode, the note is added to the arpeggio. Let go of the key. Notice that it continues to be arpeggiated. You can keep striking keys and they will keep being added.

Note that with Arpeg and Add modes, you don't have to be holding any notes when you turn on the G button. You can turn it on and then play notes and they will start arpeggiating. But if you then let go of the notes, they will stop playing in Arpeg mode but keep playing in Add mode (since you played the keys after turning on the Latch).

5. Turn the G button Off. Change the value of Latch Mode to Auto. The previous 3 modes all used controller 119 to latch the notes for the arpeggiator. Auto does not use controller 119. Play a chord. The notes arpeggiate. Press another key. The note gets added to the arpeggio. Let go of the key. Notice that the note is still part of the arpeggio. In fact you can let go of all keys but one, and every key that you pressed will still be part of the arpeggio. That is the difference between Auto and Keys (our original Latch mode). With Keys, once you let go of the key, the note is removed from the arpeggio. But with auto you can keep striking as many keys as you want to keep adding notes, and as long as you hold one note, you will hear all of the arpeggiated.

6. Finally, change the value of Latch Mode to Pedals. Hold the Controllers button and press the pedal connected to the Switch Pedal 1 jack. Make sure that the Switch Type is set to Momentary. Press the >> button, then 119, then Enter, to set the pedal to Latch 1.

PC88 Made Easy

If you have a second switch pedal, make sure it is plugged into the Switch Pedal 2 jack. Hold the Controllers button and step on that pedal. If you don't have a second pedal, hold the Controllers button and press the "E" Controllers button. Make sure that the Switch Type is set to Momentary. Press the >> button, then 118, then Enter, to set the pedal to Latch 2.

7. Now, both pedals (or pedal and button) are used to Latch the arpeggiator. Play a chord. The notes are arpeggiated. Let go of the keys. The arpeggiation stops. In Pedals mode, if both are off, then the arpeggiator works as if it is in Keys mode - any notes you play are arpeggiated.

Hold a chord and step on the Pedal 1 and hold it down. Let go of the keys. The notes continue to arpeggiate. Play a few more notes. They are added to the arpeggio. With Controller 119 On in Pedals mode, the arpeggiator works as if it is Add mode. Let go of Pedal 1. The arpeggiation stops.

Hold a chord and step on Pedal 2 (or press the E button) and hold it down. Let go of the keys. Again the notes continue to arpeggiate. Play a few more notes. This time they are NOT added to the arpeggio. With Controller 118 On in Pedals, mode, the arpeggiator works as if it is Overplay mode. Let go of Pedal 2 (or button E). The arpeggiation stops.

The reason we call this Pedals mode is that the two controllers work similarly to the way the two pedals work when they are assigned to Sustain and Sostenuto. With Controller 119, any notes held when you step on the pedal, PLUS any notes played while the pedal is still down are arpeggiated (similar to the way a piano sustains with the sustain pedal). With Controller 118, any notes held when you step on the pedal are arpeggiated, but any notes played after pedal is depressed are NOT arpeggiated (similar to the way a piano sustains with the sostenuto pedal, which is the middle pedal on a 3 pedal piano).

As you can see, the latching modes give you a great deal of control over which notes get arpeggiated. We encourage you to play around with these modes as well as the other arpeggiation parameters to see what interesting uses you can find for it.

One last thing to remember is that if you have a controller assigned to turn the Arpeggiator On and Off (which we did by assigning button F to this function in tutorial #15), the arpeggiator must be turned On in order for any of the latching functions to work.

17. Assigning a Slider to Arpeggiator Velocities

1. Start with the Setup you created in tutorial #15. Press the Arpeggiator button, then press the >> button 9 times to get to the Vel Mode parameter. Change the value to Ctrl 117.

2. Hold the Controllers button and move Slider C. Press 117, then Enter to assign Arp Vel for the slider. (You might want to check the Scale, Offset, and Curve parameters for Slider to make sure they are at their defaults of 100%, 0, and Linear).

3. Now hold some keys and move the slider up and down. The arpeggiated notes increase and decrease in volume. The slider controls the velocities used for the notes created by the arpeggiator. You could use this effect to fade arpeggiated notes in with an non-arpeggiated layer.

You could create a similar end result by assigning the slider to MIDI volume for each zone which uses the arpeggiator. However, there is a difference. If a single program switched between different samples based on the velocity of the note, then using the slider to control velocity instead of volume would let you switch between those different samples in the arpeggio. (The PC88 programs don't do this, but you might have an external module which does).

18. Using the Arpeggiator with a Sequencer or External Controller

If you are sequencing and create a Setup that uses the Arpeggiator, then the PC88 will send the actual notes that were generated by the arpeggiator to the sequencer. When you play back the sequence, it simply sends back those notes and does not actually play the arpeggiator itself. (For more on using the PC88 with a sequencer, see tutorial #23.)

But if, for some reason, you need to have the sequencer or other external controller send notes to the arpeggiator itself, you must use the Remap function in the PC88. To do this, press the Global button, the press >> 7 times to get to the MIDI In parameter. If you set this to Remap, then ALL incoming MIDI note messages will be treated as if you played those notes on the keyboard of the PC88 itself.

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

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

19. Using the PC88 to Control External Slaves

All of the techniques you have learned in the previous tutorials can be applied to playing an external keyboard or module instead of the internal PC88 sounds. There is really only one parameter you need to set.

1. Start with Setup #127 Default Setup. Press the MIDI Transmit button. Set the channel to the channel number that you wish to use to control your external slave.

2. Press the >> button. Set the Destination to MIDI. That's It! Now just edit any other parameters you need to control your slave (such as setting the bank and program change, controller settings, etc.).

When you set the Program parameter, for zones assigned to MIDI only, the Program parameter will display External Program, since - of course - the PC88 doesn't know the names of the programs on your external slave. But you will always see the program and bank numbers.

If you want to make a Setup where you layer PC88 sounds with external sounds, the simplest way to is to set some zones to MIDI (to play the external slave) and other zones to Local (to play the PC88). It is possible to have a zone set to Local+MIDI (and in fact that is the default). In this case, one zone can play both the PC88 and external slave. But keep in mind that since a zone can only send a single program change message, if you want to layer a specific external sound with a specific PC88 sound, you would have to edit your external synth so that program is stored at the same numbered location as the one you are choosing for the PC88. (Since you can't edit the PC88 programs, you can't move them to different numbered locations.)

One final thing. Typically, you will always use different MIDI channels for each zone, if you want to play different sounds on different zones. But if for some reason, you need to, you can use the same MIDI channel for a Local only zone as you use for a MIDI only zone. Since the two zones send the MIDI information to only one place or the other, both zones could be on the same MIDI channel and have different program change values (or anything else) selected.

20. Bank Controller Issues for External Slaves

This is less a tutorial than an explanation. Since most keyboards these days will have more than 128 different programs, and since MIDI only allows 128 values for any message, the bank controller was added to allow you to have multiple banks of programs with each bank having up to 128 programs in it.

There are actually TWO bank controllers: Controller #0 and Controller #32. Some manufacturers use just 0, some use just 32, and some use both. Since each bank controller can have 128 values, that means that the total number of possible banks is 128 x 128 = 16,384 (numbered as 0-16,383). Since each bank can have 128 programs in it, that means the total number of possible programs in an instrument is 2,097,152! (Think of how long it would take just to listen to that many programs.) Anyway, in practice, most instruments tend to have 10 or fewer banks.

The PC88 uses controller #32 (although you can send both without problems). There are only four banks, numbered 0-3.

When working with external slaves however, you may find they require very different values for the banks. Many Roland keyboards, for example use values of 80 or 81 for controller #0.

The PC88 actually has a parameter called Bank Mode, within the Program menu. This allows you to chose either 0 or 32 or 0/32 for an individual zone. However, if the value of this parameter is not the same as a similar bank mode parameter which is found in the Global menu, it causes the PC88 to display the bank values in a very confused manner. Therefore, we recommend that you DO NOT use this parameter - leave it set at the default value of 0/32, which is the same as the default Global Bank Mode value.

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

Controller 0/32	Bank Number Equivalent
0/0	0
0/1	1
0/2	2
etc.	
0/127	127
1/0	128
1/1	129
1/2	130
etc.	
1/127	255
2/0	256
2/1	257
etc.	

When you are on the Bank parameter in the PC88, it shows you both the 0/32 value and the bank number equivalent. When you are on other parameters, it will only show you the bank number equivalent, followed by a ":", followed by the program number.

To scroll through all the bank numbers with the alpha wheel can take a long time, so you will probably want to enter the bank number on the numeric keypad.

So to figure out which bank number equivalent you need, follow this formula: MSB x 128 + LSB. Using the Roland example, if they require you send controller #0 with a value of 80 and no value of controller #32, then you would have 80 x 128 + 0 = 10,240. If you type 10240, then press Enter when you are on the Bank parameter, you will see the display show both 80/0 and 10240.

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

21. Switching Programs on External Slaves without Playing Them

If you are performing and have two keyboards, you might run into a situation where you playing each keyboard separately (that is, each keyboard is playing its own sound), but you need to be able to quickly change the sounds on both keyboards. In this case, you can create a Setup on the PC88 which will switch the sounds on your other keyboard, but won't send any MIDI note data to it. This is easily done.

This tutorial also shows an example of copying a zone from one Setup to another.

1. Press MIDI Setups, then 128 then Enter. You have called up A Clear Setup. Press Copy, then Enter. You have now copied a zone from this Setup into the edit buffer.

2. Press the MIDI Setups, then 127, then Enter. You have called up Default Setup. Press Copy, Press the >> button. The Display should now say "Paste into zone 1?". Press the Zone 2 button, then Enter. (The display will say "Zone pasted", then revert back to "Paste into zone 2?".)You have now pasted all the parameter values from zone 1 of Setup 128 into zone 2 of Setup 127.

3. Press the MIDI Transmit button. Set the MIDI channels that you want for zones 1 and 2. Press the >> button. Set zone 1 to Local and zone 2 to MIDI.

4. Press the Program button and choose the programs that you want for zones 1 and 2.

5. Make sure that the display is on zone 2. Press the Key Range button. Press the >> button twice to get to the Note Map parameter. Press 0, then Enter to set it to Off.

6. Name and Save your Setup.

Now when you call up the Setup, it will send a program change to your external keyboard, but since the note map for that zone is turned off, no note information is sent to the external keyboard when you play the PC88.

Why did we go to the trouble of copying and pasting zones? Even though the keyboard isn't sending any notes on that zone, any controller messages will still be sent. For example, Switch Pedal 1 is assigned to Sustain in all zones in the Default Setup. So if you simply edited zone 2 of the Default Setup, then when you stepped on that pedal, you would be sending sustain messages to the external keyboard in addition to the PC88, which you probably don't want. So you would need to go to the various Controller parameters and assign the Control Number (for continuous controllers) and On Control (for switch controllers) to None. In Setup 127, the two wheels and two switch pedals are set to values other than None, so those would be the ones you want to edit. Rather than go through the steps of unassigning those four controllers for zone 2, we imported a zone from A Clear Setup, which has the all the controllers set to None.

The techniques above could also be used to send program changes to other devices, such as effects processors, etc. without sending any other info to them.

You can also use the same technique for zones assigned to the PC88 itself! Let's say you have two keyboards. On the PC88 keyboard, you want to play an internal program or

programs (up to three). On your external keyboard, you want to play its own sounds and ALSO play a program from the PC88. But your external keyboard doesn't have the abilities the PC88 has for calling up different programs. So you create a zone in the PC88 Setup to call up the internal sound you want, but set the Note Map for that zone to Off. So when you call up the Setup, it chooses the sound you want to be played from the external keyboard, but the PC88 won't play that zone.

22. Playing Programs on External Slaves without sending Program Changes

This is the opposite of the previous tutorial. What if you have an external module or keyboard that you want to play from the PC88, but you don't want to send program changes to it? (Maybe you want to leave that module always on the same sound, or you want the ability to choose the sounds directly from the front panel of that external module or keyboard).

1. Create a 2 zone Setup, following tutorial #1. Set zone 1 to Local and Zone 2 to MIDI.

2. Make sure the display is on zone 2. Press the Program button. Press the >> button. Set the Entry Transmit to Off.

3. Name and Save this Setup. Now when you call up the Setup, it won't send any program changes to your slave, but the note and controller info will still be sent.

23. Working With an External Sequencer

1. To state the obvious, you need to have MIDI cables going from the Out of the PC88 to the In of the sequencer or MIDI interface, and the In of the PC88 hooked to the Out of the sequencer.

2a. The first thing you need to do when using ANY keyboard hooked to ANY external sequencer is to turn Local Control Off. This is to avoid causing a MIDI loop problem. If the Patch Thru function of the sequencer (sometimes referred to as Soft Thru or Echo) is turned on, the sequencer takes all information coming into the MIDI In port and spits it back out the MIDI Out port on whatever MIDI channel is assigned to the currently record enabled track.

If you don't turn Local Control Off, the note gets played twice - once by the PC88 playing itself and once by the note going out to the sequencer and coming back. By turning Local Control Off, the keyboard only sends data out the MIDI Out port, and not to itself. So the signal just goes to the sequencer and is sent back, and does not get played twice.

Some software sequencers (Cakewalk is one example) will send the Local Control Off message automatically when you boot up the program. If you program doesn't do this, you will need to do it yourself.

There are two ways you can turn Local Control Off. The first and easiest way is to press the Global button, then set the Local Control parameter to Off.

2b. The second method of turning Local Control Off actually involves creating a very simple Setup. Start from Setup #127 Default Setup. Press the MIDI Transmit button and select a MIDI Channel (it really doesn't matter which one, but channel 1 is a logical choice). Press the >> button. Set the Destination to MIDI (instead of Local+MIDI). Name and Save the Setup - you might want to name it something Like Local Off or Seq. Control, etc.

Now you have a single zone setup that only sends data out of the MIDI Out port - which gives you the same thing as turning Local Control Off and playing in Internal Voices mode.

There are several reasons why you may want to use this second method. First of all, Local Control resets back to On each time you power up the PC88. The second reason is that you can edit this Setup to assign the controllers to specific values you might want to use when sequencing.

The final reason has to do with selecting programs. Typically the best way to choose the individual programs you want for each track is to choose them in your sequencer. If you have a patch list for the PC88, you can call up the programs by name, otherwise you can put the program and bank change messages in the track.

However some people like to call up the sounds on the instrument itself. The MIDI Receive button can be used to call up different programs on different MIDI channels. But the way the PC88 is designed, when you turn Local Control Off globally, it won't send the program changes internally to the MIDI Channel, even in the MIDI Receive menu. So

PC88 Made Easy

what happens is that when you go to the MIDI Receive button and call up a sound for a specific channel, the display changes but the sound doesn't actually change to the new sound! So in this situation, using the second method is better.

But since with this second method, Local Control is not turned off globally, when you go to the MIDI Receive button, you will be able to change the programs for individual channels. So whenever you want to sequence, just call up this Setup.

24. Recording Setups to a Sequencer

Again, this is less of a tutorial than an explanation. The thing that you need to remember about a Setup is that it transmits MIDI information on multiple MIDI channels, playing different programs on different channels. This is the same thing a sequencer does - you have different tracks, sending information on different channels. But on most sequencers, a track can only be assigned to a single channel. Therefore one track can't play a Setup, it can only play a Program since it is sending on one channel.

Therefore in order to record a Setup, you must set a sequencer to multi-record. Typically this involves recording to 2 or more tracks simultaneously, with each track set to a different channel. (There are some sequencers which let you multi-record to a single track, and the sequencer keeps the various channels of information separate even though they are on one track.) As you record into the sequencer, the data is then routed to different tracks depending on what channel the information is on. Then once you play back the sequence, each track plays the individual programs on the different channels, exactly the same way you played them in the Setup.

You will have to consult your sequencer manual to find out how to set it up for multi-recording.

You should also remember that if a zone in your Setup has the Destination parameter set to Local, the information won't be sent to the sequencer.

25. Customizing the Internal Voices Mode

Now that you have learned about various programming techniques for Setups, you might want to apply some of these things to the Internal Voices mode. Essentially, when you are in Internal Voices mode, you are playing a single zone setup. So all of the zone programming parameters apply. For example, you might want to assign a slider to Tempo Control for the Arpeggiator. This is easily done.

1. Start in Internal Voices mode.

2. Edit any of the parameters found within the MIDI Transmit, Program, Key Range, Transpose, Velocity, Controllers, and Arpeggiator buttons.

3. Press Store. The display will ask if you want to save a Setup and will pick the first empty Setup location.

4. Press the Internal Voices. The display now asks if you want to save to Internal Voices. Press Enter, and you are done.

Since there is only one location for the Internal Voices parameters in memory, any changes you make using this method will wipe out the defaults that currently exist for those parameters. But if you Reset the PC88, those defaults will return. (See page 9-5 in the manual for information on resetting the PC88.)

There are two parameters which can't be changed from the defaults - the Program and the Bank. Whenever you boot up the PC88, it will always call up Program 0 Classical Piano in the Internal Voices Bank. After that, whatever sound you call up in Internal Voices mode is remembered and the PC88 will switch to that sound if you switch to Internal Voices mode from MIDI Setups mode. In addition, the Effects settings aren't set by the above method. Since each individual Program can have its own Effects, the regular method of choosing an Effect setting for a program (as described in the intro section of this document) still applies.

26. Using SysEx to Store Your Setups

If you start to edit your own Setups, you will want to store them externally, in case anything happens to your battery backed memory, or you need to create more Setups than you have room for in the PC88. Since the PC88 does not have its own disk drive, you must save this info by sending a system exclusive dump to an external device such as a sequencer or sysex recorder.

You can either dump the entire memory in one shot, or you can dump individual Setups.

To dump the entire memory:

1. Connect a MIDI cable from the Out of the PC88 to the In of your external device.

2. Press the Global button, then press the >> button until you see "Dump all Setups?" in the display.

3. Start the recording on your external device and press Enter on the PC88. The MIDI Receive light will blink and the display will show you the Setups being dumped. Once it is finished, stop recording.

A note for K2000/K2500 users: The sequencer in the K2000/K2500 can only allow songs up to 64k. A dump of the entire PC88 memory is larger than 64k. So you can't use this method. Instead you must dump individual Setups. If you need to dump all 128 Setups, you can put half of them in one song and half in another.

To dump individual Setups:

1. Connect a MIDI cable from the Out of the PC88 to the In of your external device.

2. Call up the Setup you want to Dump. Press the Store button, then press the >> button twice. The display will now show "Dump setup ...?".

3. Start the recording on your external device and press Enter on the PC88. The MIDI Receive light will blink and the display will tell when the dump is finished. Once it is finished, stop recording.

To load a dump back into the PC88:

1. Connect a MIDI cable from the In of the PC88 to the Out of your external device.

2. Play back the sequence, or initiate the dump playback from your external device. That's it. You don't have to put the PC88 in any special mode to receive the dump.

When a dump is sent back to the PC88, the information goes to the memory location for that Setup. It does NOT update the edit buffer. Therefore you have to call up that Setup after the dump to hear it. For example, let's say you have dumped Setup #65 previously

and have since edited that Setup and have #65 currently called up. If you dump the Setup back into the PC88 and then play the keyboard, you won't hear the older version - you have to call up the Setup by typing in 65 and Enter on the keypad, or scrolling away and back to it.

It is always a good idea to test your dumping procedure to make sure everything worked correctly, before making massive changes. You wouldn't want to delete several months of work only to find out the sysex dump wasn't correctly recorded. A simple way to test to make some easy change and send the dump back to make sure it is received correctly. For example, you can dump the Setup, then change one letter in the Setup name and save that change. then dump the Setup back to see if the name changes back to the original. Don't forget that you have to call up the Setup after dumping it back in.

27. Trouble Shooting

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

First of all if you are not getting the expected results from your programming or are having strange results when hooked to an external device, you can use the MIDIScope utility to see exactly what MIDI messages are being received by the PC88's sound engine.

Press the Global button, the press >> until you see MIDIScope. (Or you can hold the >> button and it will quickly scroll through the parameters.) Then press Enter. The display says "MIDIScope Any Button Quits". Now the display will show EVERY MIDI message that the sound engine part of the PC88 receives, whether that message comes from PC88 itself or from the MIDI In Port. You will see exactly what type of message it is along with the value of that message. For example, a note on message will show you the note number, along with the attack velocity. A controller message will show the controller number along with the controller value. It also shows you the MIDI channel of the message. To leave MIDIScope, just press any button on the PC88.

The only limitation of MIDIScope is that it can only display one message at a time. Therefore it can be confusing if you are sending multiple channels of information at the same time. If you are testing the PC88 itself, it is best to mute all the zones but one so that you can see what info that zone is sending (or you could use the Solo button). If you are testing info coming from an external source, such as a sequencer, you would also want to mute all the tracks but one.

If you suspect a physical problem with the PC88, you can use the diagnostics to test it. The diagnostics are covered in Appendix G of the manual.

ADDITIONAL INFORMATION

A Note About the Physical Controllers

The tutorials above specify that you select a particular physical controller. But you can always choose a different controller if you want. For example, you might like to switch a function with a button instead of a pedal. The programming steps are exactly the same - you simply choose a different controller.

The thing to remember is that the controllers fall into two different types. Switch controllers are designed to have only two states - On or Off. Continuous controllers will send a range of values between 0 and 127. Logically, you will want to pick a particular controller based on what type of message you are trying to send. If you only need to send two different values, then you would typically use a switch controller, whereas if you need to send a range of values, you have to use a continuous controller.

The MIDI Controller numbers are grouped by type - Controllers 0-63, are designated for continuous control, 64-69, 96, 97, & 120-127 are switch functions. Others may be continuous or switch depending on how they are used.

But there is no reason you can't use a continuous controller for a switch type function, or assign a switch controller to a MIDI continuous controller number.

For example, you could assign a Slider to the Arpeggiator On/Off function (controller #116 in the PC88). If the slider is moved to the halfway point or higher it is On, and if the slider is moved below the halfway point, it is Off.

Or, you could assign a button to MIDI Volume and use it to toggle between two different specific volume levels. Another example of this is found in tutorial #14, where we used a button to set pan positions.

Finally, you should keep in mind that there are actually two different types of continuous controllers. the Sliders, CC pedals, and Wheel 1, will stay wherever you move them to, but Wheel 2 (which is almost always assigned to pitch bend) and the Mono Pressure strip return to 0 when you let go of them. You would probably never want to assign MIDI Volume to Mono Pressure or you would have to press hard on the keys all the time to hear anything.

Some info on the Global Parameters

Several of the previous tutorials have touched on some of the parameters found within the Global menu. Following is some information on some of the other parameters that may be useful to you. See the manual for complete descriptions of all the parameters.

Many of the Global parameters will revert to their defaults on power up, so you may need to set them each time you turn on the unit, if you are not using the default values.

Chg Setups - This parameter determines when a change from one Setup to the next will happen. In Immediate mode (the default), the setup changes as soon as you call it up from any of the various methods. In Keys Up mode, the change won't happen until you let go of all the keys.

Setup chg chan - Perhaps you are using the PC88 in a performance situation playing along with a sequencer, or are using another master controller along with the PC88. You might want to automate calling up Setups within the PC88. If you set this parameter to a specific MIDI channel and send a program change message on that channel, the PC88 will switch to that number Setup. You should make sure to use a MIDI channel not used for other tracks in the sequence, since a program change on that channel will switch the Setup, not the program on that channel.

Tuning - You can tune the PC88 up or down one semi-tone, in one cent increments. This can be useful if you are playing along with a recording, or playing with other acoustic instruments that can't be easily retuned.

Recv Trans - This allows you to transpose the instrument globally, for all MIDI channels. (Using the Transpose function in the zone parameters will only affect individual zones in a Setup, or if changed in Internal Voices mode, would affect any program you play on the keyboard, but not any information coming in the MIDI In port.)

All Notes Off - If you set this to Ignore, the PC88 will ignore the MIDI All Notes Off message. Some instruments and sequencers (notably older Roland instruments) will send this message when no notes are being held, even if the sustain pedal is still held. If you are hooked to a Roland sequencer and find that the PC88 doesn't seem to sustain, set this parameter to Ignore and the problem will go away.

General MIDI - Turn this parameter On if you want the PC88 to function as a GM instrument (you need the VGM board for this). Although there is a sysex message which can be sent from a sequencer which turns GM On, the PC88 unfortunately does not respond to the message, so you have to turn on GM each time you power up the unit, if you need it in this mode.

Using the Copy Function

To copy all the parameters from one zone to another:

1. Call up the Setup. If you have already entered the Setup Editor, make sure you are NOT on one of the parameters within the Controller menu.

2. Press Copy, then press the zone button for the zone you want to copy. Then press Enter.

3. Press the >> button, then press the Zone button for the zone you want to paste into. Then press Enter.

PC88 Made Easy

To copy all the parameters from one zone to a zone in a different Setup:

1. Call up the Setup which has the zone that you want to copy. If you have already entered the Setup Editor, make sure you are NOT on one of the parameters within the Controller menu.

2. Press Copy, then press the zone button for the zone you want to copy. Then press Enter.

3. Press the MIDI Setups button. Select the Setup that you want to paste into.

4. Press the Copy button. Press the >> button, then press the Zone button for the zone you want to paste into. Then press Enter.

To copy all the controller parameters from one controller to another:

1. Call up the Setup which has the controller data that you want to copy. Hold the Controllers button and move the controller that you want to copy, to bring up the first parameter for that particular controller. If you are not on the zone which has the controller parameters you want to copy, press the zone button for the correct zone.

2. Press Copy, Enter.

3a. If you want to copy the data to the same controller but in a different zone, press the appropriate Zone button, then press the >> button to get to the Paste parameter, then Enter.

3b. If you want to copy the data to a different controller, hold the Controllers button and move the new controller. You can also choose a different zone at this point by pressing the appropriate zone button. (For example, you might want to copy all the Zone 1, Slider A parameters to Zone 2, Slider B.) Press the Copy button, then the >> button, then Enter.

3c. You can also copy the controller parameters into a different Setup. Press the MIDI Setups button and select the Setup you want to paste into. Hold the controllers button and move the appropriate controller. Press the Zone button for the appropriate Zone. Press the Copy button, then the >> button, then Enter.

It is important to keep in mind that you can only copy and paste into similar controllers - the parameters for a switch controller can only go to another switch controller, and those for a continuous controller can only go to another continuous controller.

To copy all the Arpeggiator parameters from one Setup to another:

1. Call up the Setup which has the arpeggiator data that you want to copy. Press the Arpeggiator button.

2. Press Copy, Enter.

3. Press the MIDI Setups button. Select the Setup that you want to paste into. Press the Arpeggiator button.

4. Press the Copy button. Press the >> button, then Enter.

You should be aware that this will only copy the parameters found within the Arpeggiator menu. If you have any controllers assigned to function such as Arp Latch or Arp Switch, they will not be copied.

To copy all the Effects parameters from one effects processor to the other or from one Setup to another:

If you have just edited the Internal effects and want the same settings for the VGM effects (or vice versa), you can copy and paste those settings.

1. Call up the Setup which has the effects data that you want to copy. Press the Effects button. If you want to copy the Internal effects, go to step 2. If you want to copy the VGM effects, press the >> button 5 times to get to one of the VGM effects parameters.

2. Press Copy, Enter.

3a. Press the << or >> buttons until the display changes from one of the Internal effects parameters to one of the VGM effects parameters (or vice versa). Go to Step 4.

3b. You can also paste the effects into a different Setup. Press the MIDI Setups button. Select the Setup that you want to paste into. Press the Effects button. If you want to paste into the Internal effects, go to step 4. If you want to paste into the VGM effects, press the >> button 5 times to get to one of the VGM effects parameters.

4. Press the Copy button. Press the >> button, then Enter.

Special characters for naming Setups

Following is a list of all of characters available for Setup names, in the order in which they are found. The easiest way to get to them is to press one of the alphanumeric buttons to select a character close to the one you want, then scroll to it with the alpha wheel. Here's the whole list:
! " # $ % & ' ( ) * + , - . / 0 1 2 3 4 5 6 7 8 9
: ; < = > ? @ A through Z
[\ ] ^ _ ' a through z (space).

We hope this tutorial has been helpful and you now have a much better understanding of how to program the PC88. If you have any questions or comments, please send email to support@kurzweilmusicsystems.com.