PC88 Performance Controller
VGM Board Option
Installation Manual

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Part No. 910250 Revision A

PC88 VGM Board Installation Kit

This document describes the installation of the Voice / GM (VGM) expansion board into the PC88 Performance Controller. It is intended *only* for authorized Kurzweil service technicians. Installation by unauthorized personnel will void the warranty.

Note: A PC88 with an installed VGM board has the same functionality as a PC88mx.

Tools and Materials Required For Installation

#2 (medium) Phillips screwdriver
Clear adhesive tape
Headphones

Components of the VGM Option Installation Kit

- VGM Board
- VGM Board Mounting Bracket
- VGM Option Front Panel Label
- (2) Foam Spacers
- Warranty Card
- These Instructions

Before beginning The Installation

You will need a flat work area large enough to open the PC88 onto. A table top that measures at least 60" by 30" is recommended. You should also have a soft surface or a pair of padded blocks onto which to place the PC88's top while you are working on it. This is to prevent it from becoming scratched and to minimize pressure on the alpha wheel and sliders.

You should run the PC88's internal diagnostics both before and after installing the VGM board. Running the diagnostics before installing the VGM board confirms that there are no pre-existing problems with the instrument; running the diagnostics after the installation verifies the functionality of the instrument (including the VGM board).

Note: The diagnostics erase the PC88's random access memory (RAM). Therefore, the instrument's owner should be advised that any user-defined Setups will be lost. To save the Setups, they should either be backed up by doing a Sysex dump (PC88 Global Menu) or documented by using the Setup templates in Appendix E of the *PC88 Musician's Guide*.

To run the diagnostics:

1. Power up the unit while simultaneously holding the **1**, **2**, and **3** buttons. Release the **1**, **2**, and **3** buttons within two seconds of turning on the PC88. After a brief introductory message, the display will appear as follows:

   ```
   Press <<< to Reset
   Press >>> for Diags
   ```

2. Press the **>>>** button, which will enter diagnostics. ***Note that some diagnostic tests destroy the RAM; therefore, anything stored in the non-volatile memory will be lost!***

   The following will appear in the display:

   ```
   Menu
        CPU Test
   ```

Before continuing, set the PC88's volume slider to its minimum setting. Some tests produce loud, potentially destructive test tones. When these tones begin to sound, if you wish, you can adjust the volume slider to hear them.
Press the **Zone 3** button. This will run all of the available tests in sequence, displaying the name of each as it executes. After each test finishes, the LCD will show *Pass* or *Fail* in the upper, right-hand corner. You must press any button (or keyboard key) to continue with the next test in the sequence.

Three tests in the sequence require special treatment: the *MIDI UART Test*, the *VGM Port Test*, and the *Sound Test*. The *MIDI UART Test* requires that a MIDI cable be connected between the MIDI Out and MIDI In connectors on the back of the unit. If this MIDI cable is not installed, the test will fail. If this test passes, however, even when there is nothing connected to the MIDI In connector, there is a problem with the unit.

The *VGM Port Test* requires a VGM option to be installed, so it will fail until the VGM board is installed.

The *Sound Test* produces five test tones in sequence. Connect the headphones, then turn the volume slider up a small amount to hear the tones. You must press a button or keyboard key after each one sounds in order to advance to the next. ***These tones are likely to be very loud, so be sure to set the PC88's volume slider to its minimum setting before running the diagnostic tests.*** You can adjust the volume slider after each tone begins to sound.

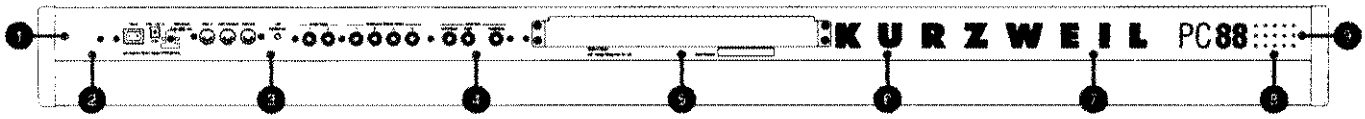
3. The following will appear in the display when the diagnostic tests have completed:

Power down the PC88 when you have finished running the diagnostics.

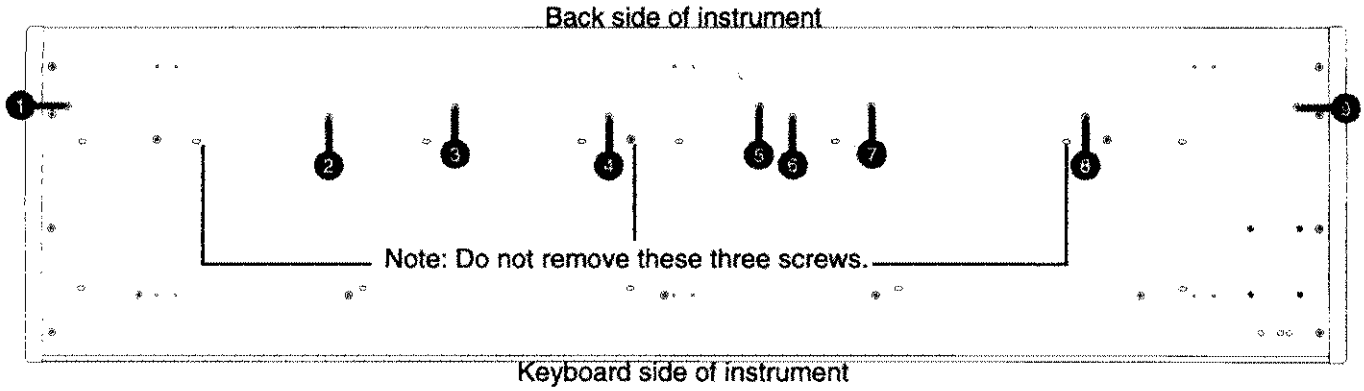
Disassembly

1. Unplug all external wires, cables, and connectors from the PC88.

2. Using a #2 Phillips screwdriver, remove the nine screws on the back of the PC88 that fasten the top to the rest of the unit. These screws are shown in the illustration below.



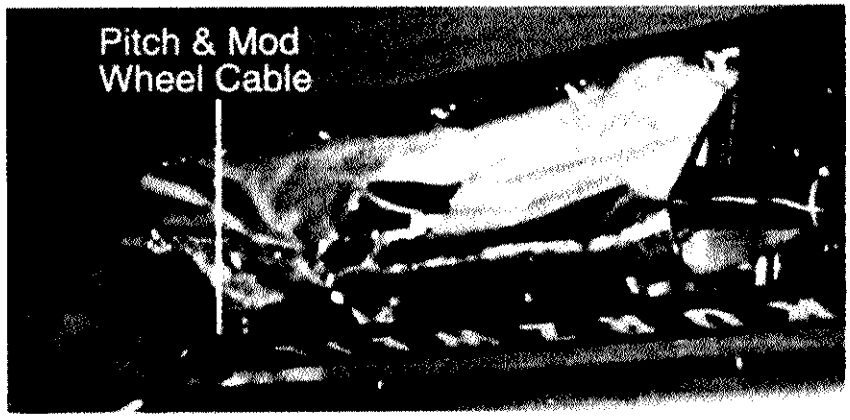
3. Some units also require the removal of 9 additional screws from the bottom of the unit (shown in the illustration below). These screws attach the enclosure support wall, which is only present on later PC88s. Turn the unit over onto a soft surface, check for the presence of these 9 screws, then remove them if they are there. Be careful to remove only the screws indicated.



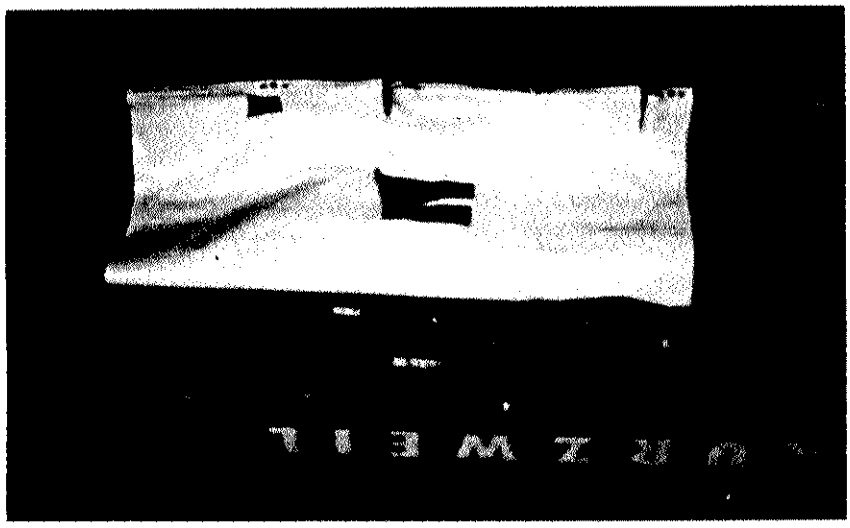
4. With the PC88 in an upright position, push the top with your thumbs, as shown below. You will be able to feel the top become unclipped, allowing you to push the top back about 1/2".

5. Slide your fingers under the felt that rests on top of the keyboard, then tilt the top back onto a soft surface or padded blocks. The underside of the PC88's top should now be facing you.

6. PC88s without the enclosure support wall have foil EMI shields. If the PC88 has these shields, as shown below, remove the back row of screws (i.e., the row closest to the KURZWEIL logo on the back of the instrument) from the shield at the left end (bass side) of the instrument. Set these screws aside, as they will be used later for reattaching the shield and for holding the VGM board bracket in place.



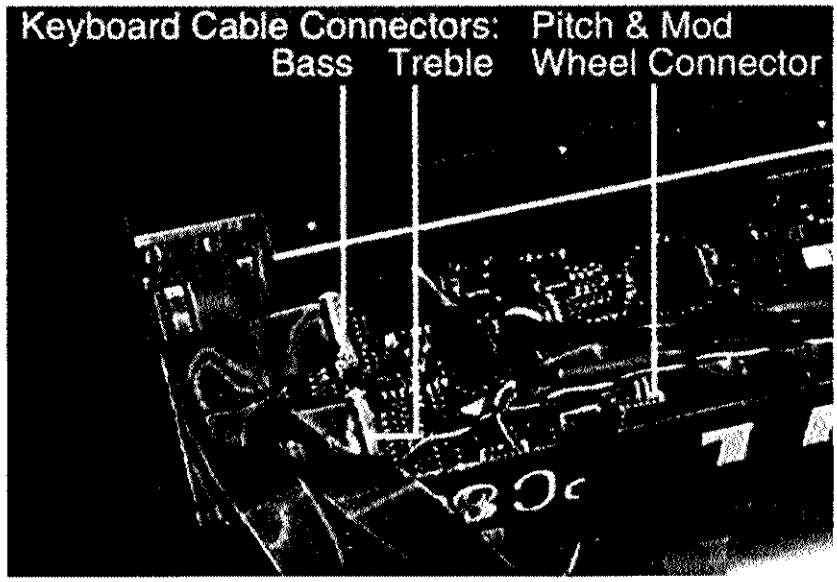
7. Disconnect the pitch and mod wheel cable (Wheel: J14) from the PC88 engine board. This cable is indicated in the illustration above. Note that this cable has different colored wires to help you keep it oriented. If this instrument has an EMI shield, fold it out of the way, as shown below, after removing the pitch and mod wheel cable.



8. Disconnect the keyboard cables (Bass: J5 and Treble:J6) from the PC88 engine board (behind the KURZWEIL logo on the back of the instrument's top), as shown below. The cables may be attached to their connectors with clear adhesive tape; remove this first.

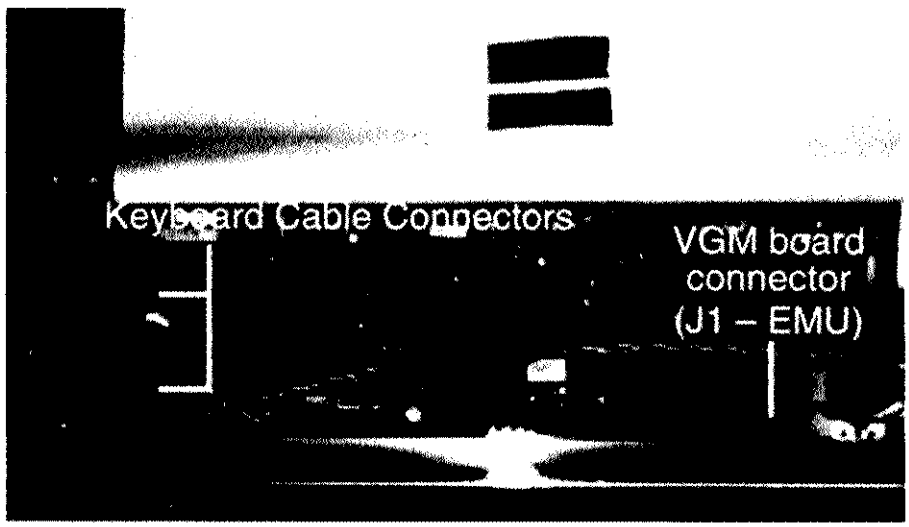
   Keep track of which keyboard cable is which (Bass or Treble), and also the orientation of the connectors on all of the cables. The keyboard cables have a red stripe on one edge indicating pin 1. Furthermore, all connectors are keyed, and cannot be plugged in backwards.

   After you remove the keyboard cables, the top is completely disconnected from the rest of the instrument. You can now move the top to a more convenient work area if you wish.

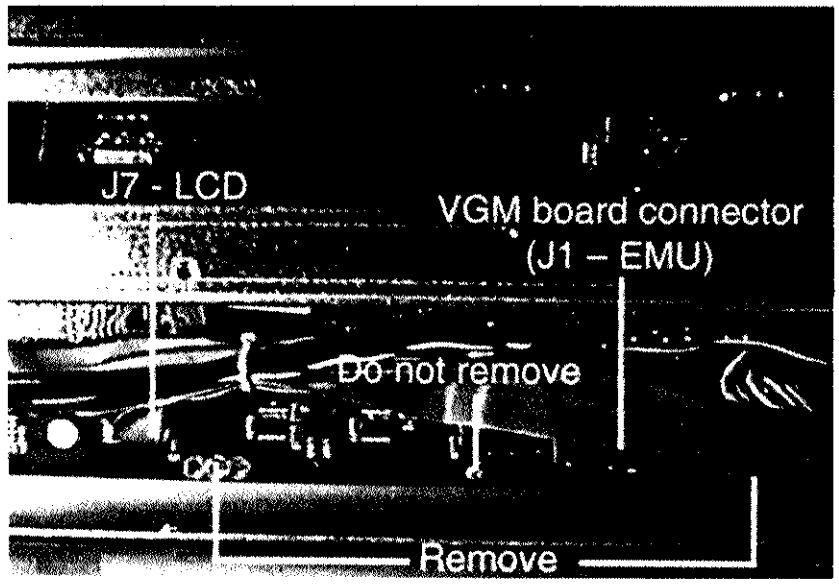


Installing the VGM board

1. Locate the VGM board connector J1(labeled EMU) on the PC88 engine board. The illustration below shows the location of the VGM board connector in relation to the keyboard cables removed in the previous step. You may have to move some cables to find the connector or to give you better access to it.



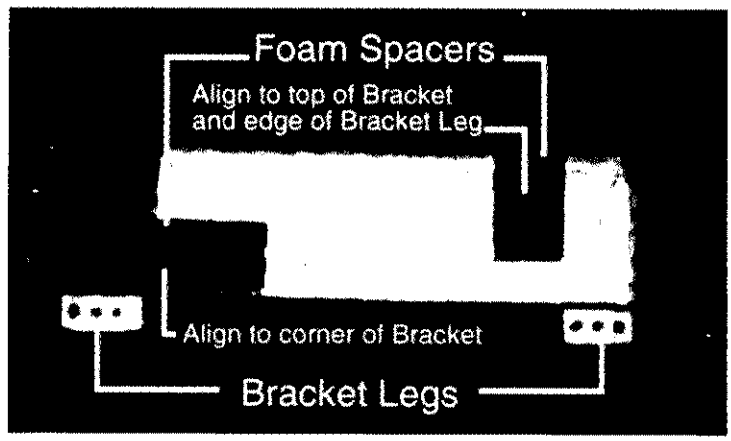
2. ***PC88 with enclosure support wall only:*** Remove the two screws indicated in the illustration below. Notice that the screw between the two shown in the illustration should not be removed. Set the screws aside; you will use them later for attaching the VGM board's bracket.



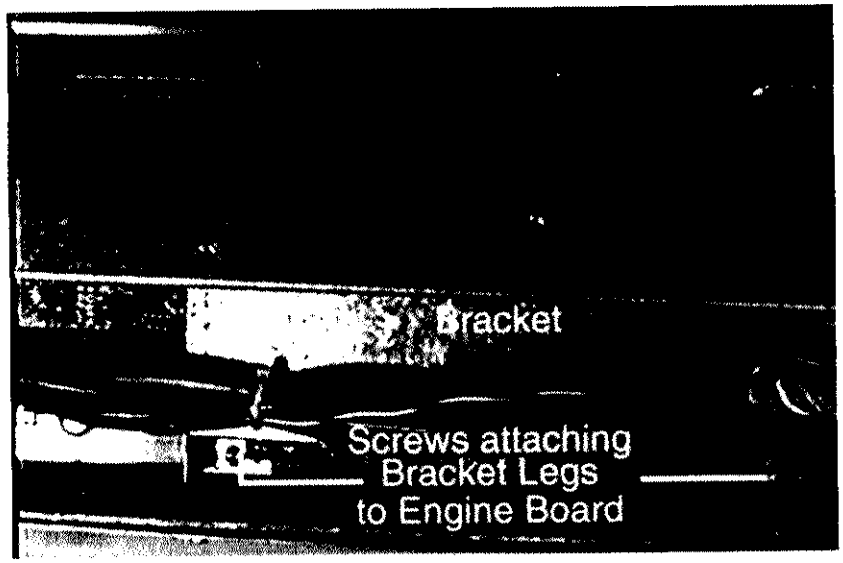
3. Carefully slide VGM board under cables and insert it into connector J1. The connector is labeled "EMU".

4. Turn the bracket upside down, so that the bracket legs stick in the air, and orient the bracket as shown in the illustration below.

5. Apply the foam spacers to the bracket. As shown in the illustration below, one foam spacer goes horizontally in the lower left-hand corner of the bracket, while the other goes vertically along the top edge of the bracket, with its right edge aligned to the left edge of the right bracket leg. Make sure that the foam spacers go on the side of the bracket from which its legs protrude. The foam spacers will hold the VGM board in place; one spacer will rest on top of the VLSI chip on the board, and the other will line up with the VGM board's connector. The foam spacers have an adhesive on one side of them. Double check the position of the foam spacers, then peel off the backing paper, then press the spacer onto the bracket to attach it.



6. Carefully slide the bracket so that it is on top of the VGM board but underneath the cable assembly (and underneath the enclosure support wall, if present, as in the illustration below).



7. You should also check the LCD connector at J7 at this time. Since this connector is right next to the VGM board bracket, it is possible that it could have been disturbed during the installation. If this connector does not have clear adhesive tape holding it into place, tape it now.

PC88 with enclosure support wall : Reinsert the screws that were removed earlier, using them to attach the bracket. The illustration above shows the bracket held in place with these screws. Do not overtighten the screws.

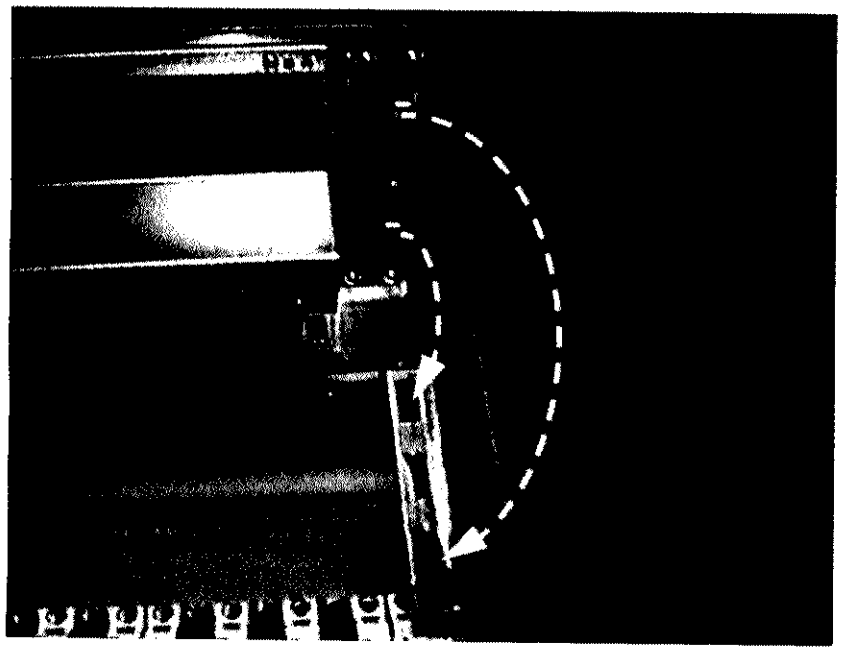
PC88 with EMI shield: Reattach the EMI shield using the screws that were removed earlier. Two of the screws will also attach the bracket to the engine board. Line up the holes on the shield with the holes on the bracket legs and the engine board, then reinsert these two screws. Do not overtighten the screws.

The foam spacers on the bracket should now be holding the VGM board firmly in place. This completes the installation of the VGM board.

Reassembly

1. Reconnect the Treble and Bass keyboard cables and the Pitch & Mod Wheel cable to the connectors on the engine board and tape them securely into place with clear adhesive tape. Make sure that the cables are oriented in the same way as they were when you disconnected them.

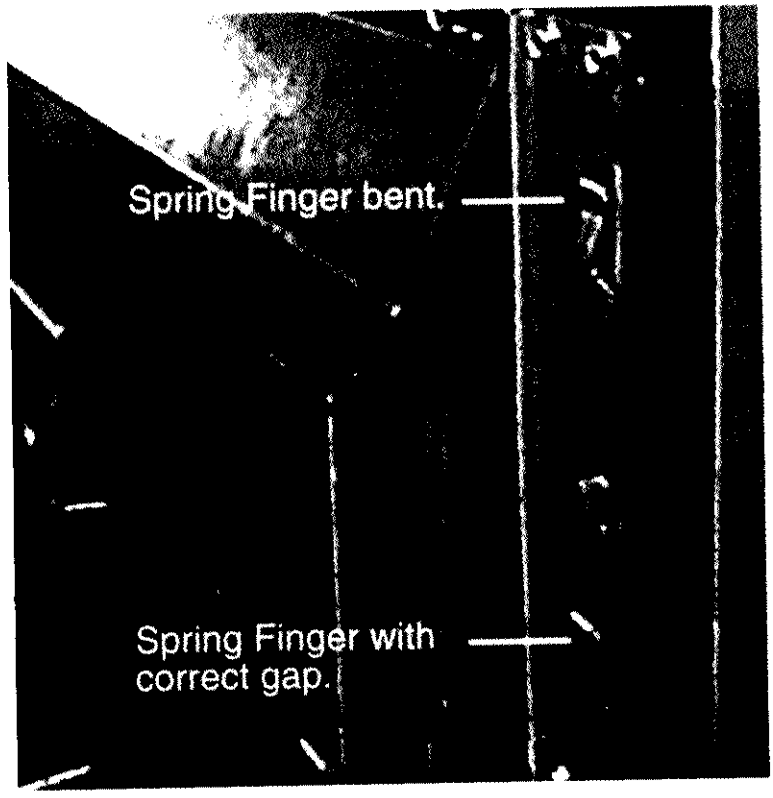
2. Tilt the top back onto the body of the PC88. The spring fingers that hold the top to the bottom should go into the slots on the bottom as shown below. Also, make sure that the keyboard cables will not interfere with the reassembly by sticking out of the PC88's enclosure or lying under the enclosure support wall.



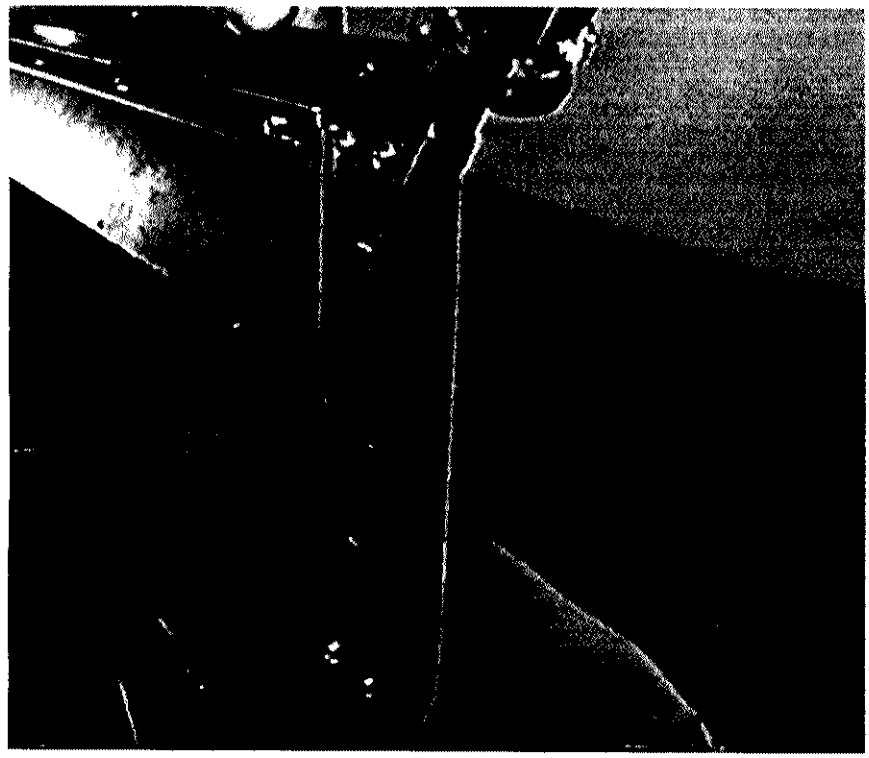
3. Making sure that the spring fingers are in the slots, place the PC88's top onto the bottom of the instrument, as shown below. The back of the PC88's top should extend about a half an inch from the bottom of the instrument. Check to make sure that the keyboard cables are not

being pinched, then pull the top towards the front of the instrument to engage the spring fingers and close the top.

4. If the top does not readily slide into a closed position, one of the spring fingers may have become bent, closing the gap that slides into the slot on the bottom of the PC88, as shown below:



5. Use a flat-head screwdriver to widen the spring finger's gap, as shown below:



6. After sliding the top into place, replace the 9 screws on the PC88's back, and (if applicable) the 9 screws on the bottom of the instrument attaching to the enclosure support wall.

7. Attach the power cord and start the unit. The start-up display should indicate the presence of the VGM board. Another quick way to check for the presence of the board is to turn the alpha wheel, scrolling through the list of Internal Voices (bank 0). With the VGM board installed, the General MIDI Voices (bank 1) followed by the Expansion Voices (bank 2) will appear in the display following voice 127 of bank 0.

8. Run the PC88's internal diagnostics to verify the functionality of the instrument as a whole, including the VGM board. Power up the unit while simultaneously holding the **1**, **2**, and **3** buttons. Release the **1**, **2**, and **3** buttons within two seconds of turning on the PC88. After a brief introductory message, the display will appear as follows:

```
Press <<< to Reset
Press >>> for Diags
```

9. Press the **>>>** button to enter diagnostics. The following will appear in the display:

```
Menu
     CPU Test
```

Before continuing, set the PC88's volume slider to its minimum setting. Some tests produce loud, potentially destructive test tones. When these tones begin to sound, if you wish, you can adjust the volume slider to hear them.

10. Press the **Zone 3** button. This will run all of the available tests in sequence, displaying the name of each as it executes. After each test finishes, the LCD will show *Pass* or *Fail* in the up-

per, right-hand corner. You must press any button (or keyboard key) to continue with the next test in the sequence.

Three tests in the sequence require special treatment: the *MIDI UART Test*, the *VGM Port Test*, and the *Sound Test*. The *MIDI UART Test* requires that a MIDI cable be connected between the MIDI Out and MIDI In connectors on the back of the unit. If this MIDI cable is not installed, the test will fail. If this test passes, however, even when there is nothing connected to the MIDI In connector, there is a problem with the unit.

The *VGM Port Test* will play five test tones in sequence. You must press a button or keyboard key after each tone sounds in order to advance to the next. ***These tones are likely to be very loud and potentially destructive, so be sure to set the PC88's volume slider to its minimum setting before running the diagnostic tests.*** You can adjust the volume slider after each tone begins to sound.

The *Sound Test* produces five test tones in sequence. Connect the headphones, then turn the volume slider up a small amount to hear the tones. You must press a button or keyboard key after each one sounds in order to advance to the next. ***These tones are likely to be very loud, so be sure to set the PC88's volume slider to its minimum setting before running the diagnostic tests.*** You can adjust the volume slider after each tone begins to sound.

11. To leave Diagnostics mode, restart the PC88, without holding down any of its keys or buttons.

12. The VGM Option Installation Kit includes a PC88mx label that the instrument's owner may wish to attach to the instrument. The location for this label is shown on the attached sheet. You should give this sheet, as well as the label, to the instrument's owner.

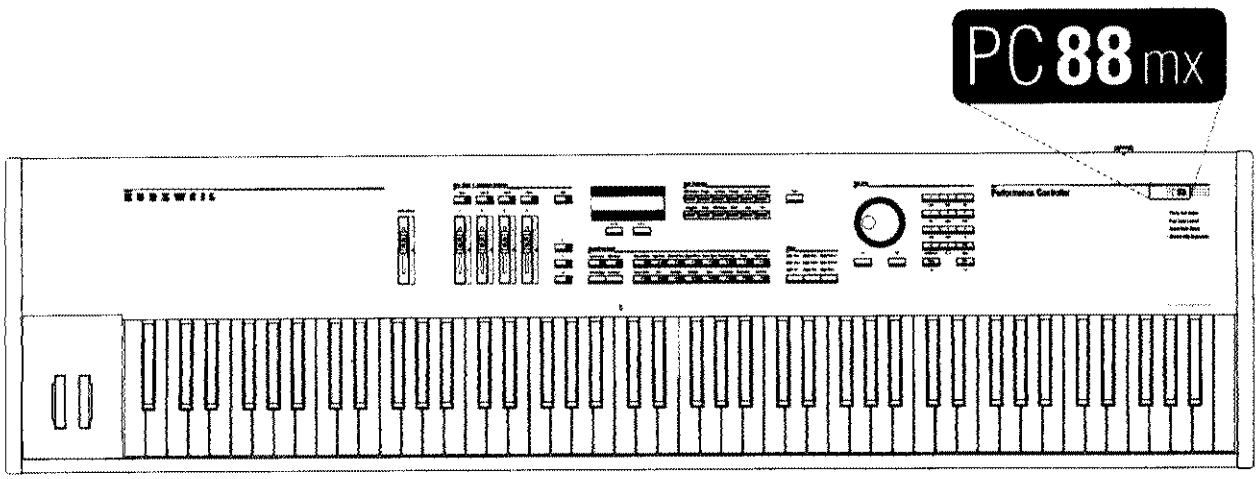
This completes the reassembly of the PC88.

Please detach this sheet and give to unit's owner along with the PC88mx label.

Front Panel Label Installation

We have provided you with a front panel label for the PC88 to identify your unit as a PC88mx (PC88 with VGM board). See the label location figure below for recommended placement. Use the green line above the instrument's existing PC88 logo as a guide for lining up the PC88mx label.

PC88mx Front Panel Label Location



Note: All user documentation for the VGM board is included in the *PC88 Musician's Guide* (Part No. 910243), and is highlighted with the VGM logo shown below:

VGM