

Kurzweil PCX-1

Polyphony Expansion Kit Installation Guide

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KURZWEIL
Music Systems

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The Polyphony Expansion Kit

Thanks for purchasing the PCX-1 Polyphony Expansion Kit! This kit (part number 140071) doubles the polyphony of Kurzweil PC2s—from 64 voices to 128. This document contains instructions for installing the PCX-1 in all PC2 models: the 76-key PC2, the 88-key PC2X, and the rack-mount PC2R.

Please read the all of the introductory information (through *Tools and Materials Required for Installation*) before proceeding with the installation. Then go to *Installing in Keyboard Models* on page 6 if you're installing the PCX-1 in a keyboard, or *Installing in Rack-Mount Models* on page 13 if you're installing it in a rack unit.

Contents of the Kit

In addition to this document, your PCX-1 kit should contain the following items:

- Polyphony Expansion board (PCX-1 board)
- Two screws (not needed for keyboard models)
- Floppy disk containing PC2 operating system and boot block software upgrades
- Floppy disk containing PC2 soundware upgrades

Safety Precautions

To prevent risk of electrocution, make sure that the PC2 or PC2R is disconnected from its power supply before you begin disassembling the instrument.

Static electricity, even in small amounts, can cause damage to electronic components (especially memory). Before disassembling the instrument, touch a conductive metal surface to discharge any static electricity that you may have built up.

Saving Your Data

You may need to update one or more PC2 software components as part of your PCX-1 installation (see *Checking Software Versions* on page 4). If you *do* need to update any software, you'll need to do a hard reset after the update. This deletes all user-defined data (programs, setups, and effects) from the PC2's memory. If you want to keep your user data, you should do a SysEx dump of all objects before you update your software.

System Requirements

All PC2 series instruments contain three main software components.

Operating system software	Defines the performance and editing characteristics of the PC2. Must be Version 2.1 or later to work correctly with the PCX-1.
Soundware	Defines the characteristics of programs and setups. Must be Version 2.0 or later to work correctly with the PCX-1.
Boot block software	Contains diagnostic software and other functions (like software updates) not related to performance or editing. Must be Version 2.0 or later to work correctly with the PCX-1.

If you have a PC2R (the rack-mount model), you'll need to check the version of the *operating system software*, as described below (you don't need to check the versions of the soundware or boot block software, since all PC2Rs have at least Version 2.0 of these software components). If you have any of the keyboard models, you'll need to check the versions of *all three* software components.

Checking Software Versions

PC2 and PC2X (Keyboard)

You need to check the versions of *all three* software components. As you check each software component, make a note of whether you need to update it. If you need to update one or more components, turn to *Updating Software* on page 6. If you don't need to update any components, proceed to *Removing the Access Panel* on page 10.

PC2R (Rack-Mount)

Remember, you already have Version 2.0 or later of the soundware and boot block software, so all you need to check is the version of your operating system software (see *Checking the Operating System Software Version* on page 5). If the operating system software needs updating, turn to *Updating Software* on page 13. If it doesn't need updating, turn to *Removing the Top Panel* on page 15.

Checking the Boot Block Software Version (Keyboards only)

The boot block isn't accessible during normal PC2 operations, since the only time you'll need to use it is when you want to run diagnostics, install a ROM sound option, or update software.

To activate the boot block, turn the instrument on, and watch the display (if it's already on, turn it off then on again). When you see **Please wait...**, press and release the **Panic** button. This starts the boot block. After a few seconds, you'll see another message indicating that you're running the boot block. The bottom line of the display shows the version of the boot block software. This message doesn't remain visible for long, so check it quickly. If the version number is lower than 2.0, you need to update your boot block (see page 7).

To return to normal operation, press the **Right** cursor button until you see **Run engine** in the bottom line of the display, then press **Yes**.

Checking the Operating System Software Version

There are two ways to check the version of the operating system software. The first is to watch the display as the instrument powers up. During powerup, the display shows several messages. One of these messages is **Welcome to the PC2**; this message also indicates the version of the operating system software on the bottom line of the display.

The second way to check the version of the operating system software is to check the value of one of the parameters in the Global menu. Press the **Global** button, then press the **Right** cursor button until you see a parameter called OS Version.

Whichever method you use, if the operating system version is lower than **2.1**, you need to update your operating system software. See *Updating Operating System Software* on page 8 (for keyboards) or page 14 (rack-mount).

Checking the Soundware Version (Keyboards only)

To check the version of your soundware, select Program **127** in the User bank (Bank 1). This is a sine wave that the PC2 uses in its internal diagnostics. The program name should be **Sine v2.0** (or a higher number). If the number is lower than **2.0**, you need to update your soundware (see page 8).

Tools and Materials Required for Installation

- #1 (small) Phillips screwdriver
- Two thick foam pads (keyboard models only)

You'll need a flat work area large enough to accommodate the disassembled instrument. Most tabletops will work for the PC2R, but keyboard models require more space—up to 60-by-30 inches, depending on the length of the keyboard. The foam pads listed in the required materials will protect the Alpha Wheel and sliders on keyboard units.

Tools and Materials Required for Software Updates

If you own a keyboard model and you need to update your operating system software, soundware, or boot block, you'll also need the following:

- Stand-alone sequencer or MIDI file player that has a floppy drive and can send System Exclusive (SysEx) data—or a personal computer (either Windows-compatible or a Macintosh or other computer capable of reading DOS disks and files) equipped with MIDI interface, floppy disk drive, and sequencing software capable of sending SysEx data.
- MIDI cable

Sequencer Software for Windows-Compatible Computers

For Windows-compatible computers, we recommend using Windows Media Player, which you can download from the following site:

<http://www.microsoft.com/windows/windowsmedia/en/Download/default.asp>

We've also tested Cakewalk and Logic, although some versions of Cakewalk send the SysEx data too quickly for the PC2 to process. If you use Cakewalk and you're unable to update, please see Cakewalk's on-line help, which describes how to modify an INI file to reduce the SysEx transmission speed.

Sequencer Software for Macintosh

We've tested MIDIGraphy 1.4.3, which you can download from the following site (note that there's no "www" in this URL):

`http://member.nifty.ne.jp/mmaeda/e/works.html`

Older versions of MIDIGraphy tend to crash with Mac OS 8 and 9. Additionally, Windows Media Player for the Macintosh does not work at all.

We've also tested Performer 5.0.1 (at tempos up to 215 BPM), and Logic.

Installing in Keyboard Models

If you haven't checked the versions of your boot block software, operating system software, and soundware, do so before beginning installation. To function properly, the PCX-1 requires Version 2.0 or later of the soundware and boot block software, and Version 2.1 or later of the operating system software.

See *Checking Software Versions* on page 4 to learn how to check software versions. If you need to update one or more software components, see *Updating Software* below. Otherwise, turn to *Removing the Access Panel* on page 10.

Updating Software

You'll need to update any software components that aren't current with the system requirements listed on page 4. Updating the software is extremely convenient; all you have to do is load one or more MIDI files into the PC2's flash ROM using a sequencer application. Here's how to set it up.

Saving Objects

Updating software components requires you to do a hard reset before resuming normal operations. This deletes all user-defined information from the PC2's memory. You should dump all user-defined programs, setups, and effects to an external memory source (like a computer sequencer) before updating your software. Otherwise, they'll be lost.

See the programming chapter in your *PC2 Musician's Guide* for information about dumping programs and other objects.

Preparing Your Computer

1. Connect a MIDI cable from the MIDI Out port on your personal computer or MIDI interface to the PC2's MIDI In port.
2. Launch the sequencer application on the personal computer.

Launching the PC2's Boot Block

You'll need to run the boot block for any software updates you make (including updating the boot block itself).

1. If the PC2 is on, turn it off.
2. Turn the PC2 on, and watch the display.
3. When you see **Please wait...**, press and release the **Panic** button. After a few seconds, you'll see **Main Menu** in the top line of the display, and **Install engine** in the bottom line. This is the boot block.
4. Follow the instructions in one or more of the following subsections, depending on which software components need updating.

Updating Boot Block Software

1. When the boot block has finished launching, press the **Right** cursor button until you see **Update boot block** in the bottom line of the display.
2. Press **Yes**. The display changes to **Update boot block via MIDI**.
3. Press **Yes**. The display changes to **Waiting for MIDI**.
4. Insert the PC2 operating system/boot block disk into the floppy drive of your computer.
5. Using the sequencer application on your computer, open the MIDI file whose name starts with **PC2BK...** The **BK** stands for "boot block, keyboard." The three digits after the **BK** indicate the version number (for example, **210** indicates Version 2.1).
6. Play the MIDI file. The top line of the display shows **SYS3-0 file 1 of 1**, and the bottom line shows **segment 1 of 1**. This file takes just under a minute to load at 215 beats per minute. When the file finishes loading, the PC2 will restart and return to a performance mode.
7. Turn off the PC2, then turn it back on and press **Panic** when you see **Please Wait...** in the display. This launches the new boot block. You should see the new version number as the boot block launches.
8. Follow the instructions in one or both of the following subsections, depending on which software components need updating. If you need to update the boot block software, chances are that you'll need to update both the operating system software and the soundware as well. However, if you *don't* need to update any more software components, proceed to *Doing a Hard Reset* (page 9).

Updating Operating System Software

The operating system software, together with the soundware data, are part of the PC2 sound engine. You'll use the **Install engine** (sound engine) option to install both the operating system software and the soundware.

1. When the boot block has finished launching, press **Yes** (this selects the **Install engine** option, which is the first option in the boot block menu). The display changes to **Install engine via MIDI**.
2. Press **Yes**. The display changes to **Waiting for MIDI**.
3. If necessary, insert the PC2 operating system/boot block disk into the computer's floppy drive.
4. Using the sequencer application on your computer, open the MIDI file whose name starts with **PC2K...** The **K** stands for "keyboard operating system." The three digits after the **K** indicate the version number.
5. Play the MIDI file. The top line of the display shows **SYS3-0 file 1 of 1**, and the bottom line shows **segment 1 of 8**. This file takes about four minutes to load at 215 beats per minute. When the display shows **Done**, stop the sequencer (some sequencers will stop automatically at the end of the SysEx data).
6. Press **Cancel**. The display shows **Install engine via MIDI**.
7. Follow the instructions in the next subsection if you need to update soundware data. If you don't need to update soundware, proceed to *Doing a Hard Reset* (page 9).

Updating Soundware

The soundware data, together with the operating system software, are part of the PC2 sound engine. You'll use the **Install engine** (sound engine) option to install both the operating system software and the soundware.

This procedure assumes that you've just finished launching the boot block, and the bottom line of the display shows **Install engine**. If instead you've just finished updating the operating system software (and the display shows **Install engine via MIDI**), go to Step 3.

1. Press the **Left** or **Right** cursor button until you see **Install engine** in the bottom line of the display.
2. Press **Yes**. The display changes to **Install engine via MIDI**.
3. Press **Yes**. The display changes to **Waiting for MIDI**.
4. Insert the PC2 soundware disk into the floppy drive of your computer.
5. Using the sequencer application on your computer, open the MIDI file whose name starts with **PC2S...** The **S** stands for "soundware" (for keyboard *and* rack-mount). The three digits after the **S** indicate the version number.
6. Play the MIDI file. The top line of the display shows **SYS3-0 file 1 of 1**, and the bottom line shows **segment 1 of 13**. This file takes a little over six minutes to load at 215 beats per minute. When the display shows **Done**, stop the sequencer (some sequencers will stop automatically at the end of the SysEx data).
7. Press **Cancel** twice to return to the boot block menu.
8. Do a hard reset, as described in the following subsection.

Doing a Hard Reset

This procedure assumes that you're in the boot block menu. If you aren't, relaunch the boot block (see page 7 if you need a reminder), then proceed.

1. Press the **Left** or **Right** cursor button until you see **HARD RESET** in the bottom line of the display.
2. Press **Yes**. The display prompts you with a question: **Erase RAM objects?**
3. Press **Yes**. This performs the hard reset and returns you to the boot block menu.
4. Follow the instructions in *Returning to Normal Operations* below.

Returning to Normal Operations

1. Press the **Left** or **Right** cursor button until you see **Run engine** in the bottom line of the display.
2. Press **Yes**. After a few seconds, you'll be back in a performance mode. You're now ready to begin the installation of the PCX-1 board. Turn to page 10.

Troubleshooting for Software Updates

You're not likely to have problems updating your software. In fact, there are very few things that can go wrong:

Display is Stuck at "Waiting for MIDI"

The MIDI signal isn't getting to the PC2. Make sure that the computer's MIDI Out is connected to the PC2's MIDI In. Make sure the cable isn't defective. Try another cable if necessary.

Display Never Shows "Done"

The PC2 isn't receiving all of the MIDI file data. Try playing the MIDI file at a lower tempo.

If you're still having problems, consult a Kurzweil dealer or service center.

Removing the Access Panel

The PCX-1 board fits into the access opening at the bottom of the keyboard, so the first step is to remove the panel.

1. Make sure that the PC2 is disconnected from its power supply, and that you've discharged any residual static electricity by touching a conductive object (like the metal casing of the PC2 itself).
2. Position the foam pads on your work surface so that they'll support the ends of the keyboard.
3. Place the PC2 face-down on the foam pads, with the keyboard facing away from you. Make sure that the PC2 is not resting on the Alpha Wheel or sliders.
4. Using a #1 Phillips screwdriver, remove the seven screws that secure the access panel, as shown in Figure 1.

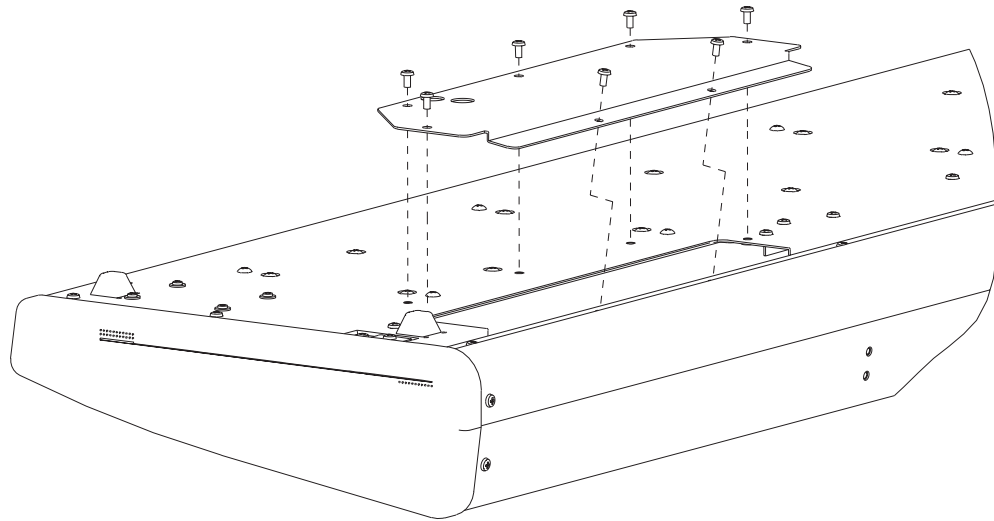


Figure 1 **Removing the retaining screws**

5. Remove the access panel by lifting its far edge and pulling it up and away from you.

Installing the PCX-1 Board

1. Locate the Engine board (see Figure 2), and identify the four white plastic standoffs (vertical pins) that will hold the PCX-1 board in place. Also notice the 24-pin male connector on the Engine board. This will plug into the connector on the PCX-1 board.

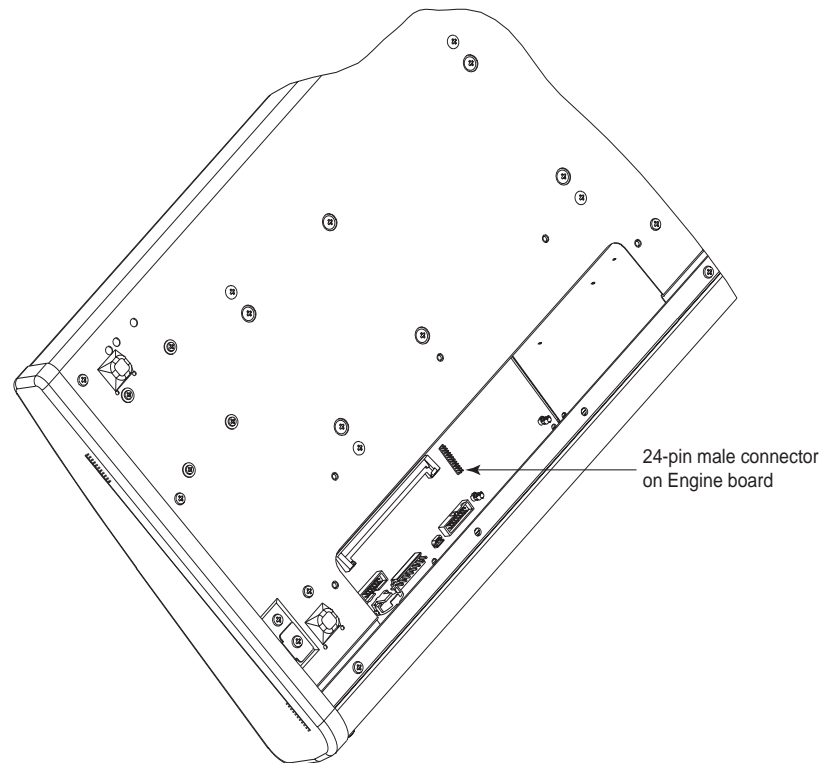


Figure 2 PC2 Engine board

2. Identify the 24-pin female connector (J805) on the PCX-1 board. It's on the bottom of the board—all of the other components are on the top of the board. Also notice the four holes that will align with the standoffs on the Engine board.
3. Grasp the board as shown in Figure 3 (page 12). The connector (J805) should be at the left side of the board, and facing away from you. Holding the board vertically, insert it through the access opening, then rotate it until it's horizontal.
4. Align the holes in the PCX-1 board with the standoffs on the Engine board. This will align the connectors. All four standoffs should protrude through the PCX-1 board.
5. Snap the PCX-1 board onto each of the four standoffs, one at a time, by pressing on the board near the location where each standoff protrudes through the board. You should both feel and hear the board snap into each standoff.

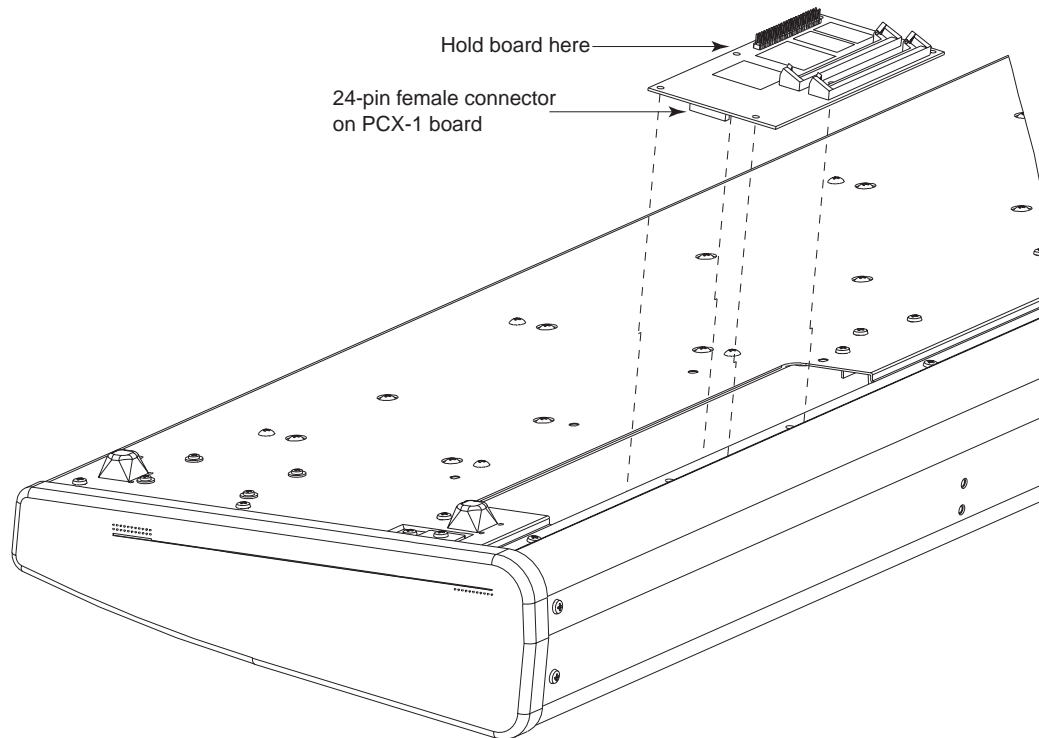


Figure 3 **Inserting the PCX-1 board**

Reassembly and Verification

1. Replace the access panel, and replace the retaining screws.
2. Turn the PC2 on, and watch the display. It should show **Welcome to the PC2P** (for 76-key models) or **Welcome to the PC2xP** (for 88-key models), then should go to a performance mode. If you don't see the **P** in the instrument name, the PCX-1 board is not installed properly, and you should repeat the installation procedure or consult a Kurzweil dealer or service center.

Installing in Rack-Mount Models

If you haven't checked the version of your operating system software, do so before beginning installation. To function properly, the PCX-1 requires Version 2.1 or later of the operating system software. (The soundware and boot block software don't need to be updated, since all PC2Rs have at least Version 2.0 of these software components.)

See *Checking Software Versions* on page 4 to learn how to check software versions. If you need to update the operating system software, see *Updating Software* below. Otherwise, turn to *Removing the Top Panel* on page 15.

Updating Software

You'll need to update the operating system software if it isn't Version 2.1 or later. Updating the software is extremely convenient; all you have to do is load one or more MIDI files into the PC2R's flash ROM using a sequencer application. Here's how to set it up.

Saving Objects

Updating software components requires you to do a hard reset before resuming normal operations. This deletes all user-defined information from the PC2R's memory. You should dump all user-defined programs, setups, and effects to an external memory source (like a computer sequencer) before updating your software. Otherwise, they'll be lost.

See the programming chapter in your *PC2R Musician's Guide* for information about dumping programs and other objects.

Preparing Your Computer

1. Connect a MIDI cable from the MIDI Out port on your personal computer or MIDI interface to the PC2R's MIDI In port.
2. Launch the sequencer application on the personal computer.

Launching the PC2R's Boot Block

You'll need to run the boot block for any software updates you make (including updating the boot block itself).

1. If the PC2R is on, turn it off.
2. Turn the PC2R on, and watch the display.
3. When you see **Please wait...**, press and release the **Edit/Store** button. After a few seconds, you'll see **Main Menu** in the top line of the display, and **Install engine** in the bottom line. This is the boot block.
4. Follow the instructions in *Updating Operating System Software* on page 14.

Updating Operating System Software

The operating system software, together with the soundware data, are part of the PC2R sound engine. You'll use the **Install engine** (sound engine) option to install both the operating system software and the soundware.

1. When the boot block has finished launching, press **Yes** (this selects the **Install engine** option, which is the first option in the boot block menu). The display changes to **Install engine via MIDI**.
2. Press **Yes**. The display changes to **Waiting for MIDI**.
3. If necessary, insert the PC2 operating system/boot block disk into the computer's floppy drive.
4. Using the sequencer application on your computer, open the MIDI file whose name starts with **PC2R...** The **R** stands for "rack operating system." The three digits after the **R** indicate the version number.
5. Play the MIDI file. The top line of the display shows **SYS3-0 file 1 of 1**, and the bottom line shows **segment 1 of 8**. This file takes about four minutes to load at 215 beats per minute. When the display shows **Done**, stop the sequencer (some sequencers will stop automatically at the end of the SysEx data).
6. Press **Cancel**. The display shows **Install engine via MIDI**.
7. Do a hard reset, as described in the following subsection.

Doing a Hard Reset

This procedure assumes that you're in the boot block menu. If you aren't, relaunch the boot block (see page 13 if you need a reminder), then proceed.

1. Press the **Left** or **Right** cursor button until you see **HARD RESET** in the bottom line of the display.
2. Press **Yes**. The display prompts you with a question: **Erase RAM objects?**
3. Press **Yes**. This performs the hard reset and returns you to the boot block menu.
4. Follow the instructions in *Returning to Normal Operations* below.

Returning to Normal Operations

1. Press the **Left** or **Right** cursor button until you see **Run engine** in the bottom line of the display.
2. Press **Yes**. After a few seconds, you'll be back in a performance mode. You're now ready to begin the installation of the PCX-1 board. Turn to page 15.

Troubleshooting for Software Updates

You're not likely to have problems updating your software. In fact, there are very few things that can go wrong:

Display is Stuck at "Waiting for MIDI"

The MIDI signal isn't getting to the PC2R. Make sure that the computer's MIDI Out is connected to the PC2R's MIDI In. Make sure the cable isn't defective. Try another cable if necessary.

Display Never Shows "Done"

The PC2R isn't receiving all of the MIDI file data. Try playing the MIDI file at a lower tempo.

If you're still having problems, consult a Kurzweil dealer or service center.

Removing the Top Panel

Installing the PCX-1 in the rack-mount PC2R requires removing the instrument's top panel.

1. Make sure that the PC2R is disconnected from its power supply, and that you've discharged any residual static electricity by touching a conductive object (like the metal casing of the PC2R itself).
2. Position the PC2R on your work surface—right side up, with the front panel facing away from you.
3. Using a #1 Phillips screwdriver, remove the seven screws that secure the top panel (see Figure 4).

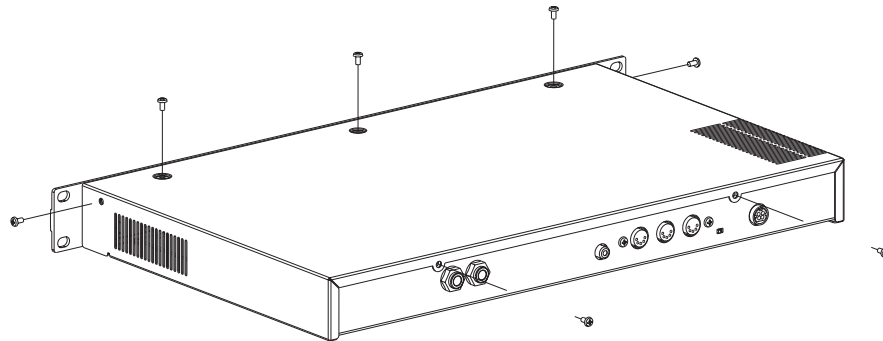


Figure 4 Removing the retaining screws

4. Grasp the front of the PC2R and slide the top panel straight back until it's free from the body of the PC2R (see Figure 5, page 16).

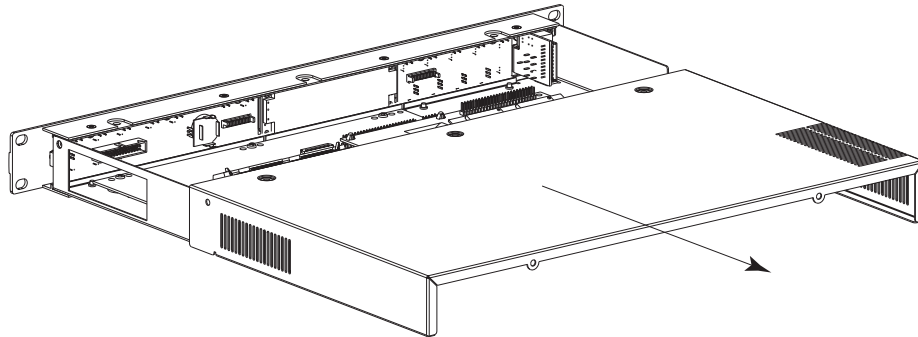


Figure 5 *Removing the top panel*

Installing the PCX-1 Board

1. Locate the Engine board (see Figure 6), and identify the four white plastic standoffs (vertical pins) that will hold the PCX-1 board in place. Also notice the 24-pin male connector on the Engine board. This will plug into the connector on the PCX-1 board.
2. Identify the 24-pin female connector (J805) on the PCX-1 board. It's on the bottom of the board—all of the other components are on the top of the board. Also notice the four holes that will align with the standoffs on the Engine board.
3. Align the holes in the PCX-1 board with the standoffs on the Engine board. This will align the connectors. All four standoffs on the Engine board should protrude through the PCX-1 board. The two standoffs on the bottom panel of the PC2R should align with the holes at the right edge of the PCX-1 board.

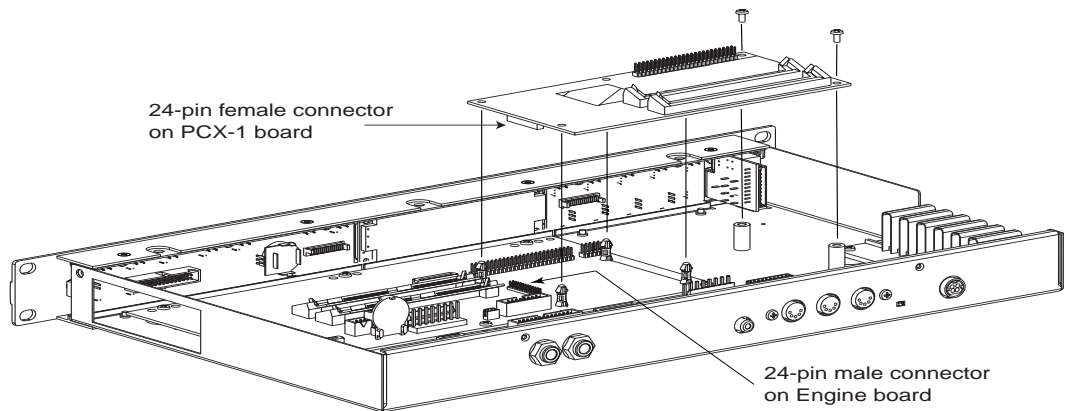


Figure 6 *Inserting the PCX-1 board*

4. Snap the PCX-1 board onto each of the four standoffs, one at a time, by pressing on the board near the location where each standoff protrudes through the board. You should both feel and hear the board snap into each standoff.
5. Thread the two screws through the holes in the right edge of the PCX-1 board and into the standoffs under the board. Tighten the screws with a #1 Phillips screwdriver. Tighten them only until snug; do not overtighten.

Reassembly and Verification

1. Slide the top panel back into place, and replace the seven retaining screws.
2. Turn the PC2R on, and watch the display. It should show **Welcome to the PC2rP**, then go to a performance mode. If you don't see the **P** in the instrument name, the PCX-1 board is not installed properly, and you should repeat the installation procedure or consult a Kurzweil dealer or service center.