

K2500/X Keyboard SMP-K2 Sampling Option Kit Installation Manual

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This document instructs Kurzweil service technicians in the installation of the SMP-K2 Sampling Option Kit. It is intended *only* for qualified Kurzweil service technicians. Installation by unqualified personnel will void the warranty.

Important Notices

This document provides installation instructions for all K2500 keyboard units, plus a special set of instructions for keyboard units equipped with the KDFX Option Board. Read this document carefully to make sure you are following the correct instructions.

Two one megabyte SIMMs is the minimum amount of sampling RAM required for the SMP-K2 Sampling Option to function; you can install up to 128 Megabytes of sampling RAM. SIMMs must always be installed in pairs. See the chart below for some typical sampling RAM configurations. Refer to the *K2500 Reference Guide* for more information on SIMM requirements.

Sampling Time Examples

		Sampling rate in KHz			
		29.4	32.0	44.1	48.0
2 x 1M	Mono	35 seconds	32 seconds	23 seconds	21 seconds
	Stereo	17 seconds	16 seconds	11 seconds	10 seconds
2 x 4M	Mono	140 seconds	128 seconds	92 seconds	84 seconds
	Stereo	70 seconds	64 seconds	46 seconds	42 seconds
2 x 16M	Mono	560 seconds	512 seconds	368 seconds	336 seconds
	Stereo	280 seconds	256 seconds	184 seconds	168 seconds

Before Beginning the Installation

Back up the K2500's RAM objects by entering Disk Mode, pressing the Save soft button, and selecting the option "Everything" to save all RAM objects to a floppy or hard disk.

Tools and Materials Required For Installation

- #2 Phillips screwdriver (medium)
- Flat-head screwdriver
- Soldering iron and de-soldering tool (these may not be required)
- 3" high padded blocks
- Cables for diagnostics:
 - (2) Analog Audio Patch Cables - 1/4" mono phone plug to male XLR connector
 - (1) Digital loopback cable - XLR male to XLR female
 - (1) Optical cable - 12" or longer

You will need a flat work area large enough to open the K2500 onto. A table top that measures at least 60" by 40" is recommended. We also recommend that you place the K2500's top on a pair of 3" high foam blocks while you work. This allows access to the rear panel, prevents it from becoming scratched, and minimizes pressure on the alpha wheel and sliders.

Components of the SMP-K2 Sampling Option Kit

- SMP-K2 Sampling Option Board
- Digital I/O Board (smaller board with 2 XLR connectors & optical connector)*
- Digital I/O Cable (15", 6-pin)
- Optical Out Cable (15", 3-pin)
- Input/Output Monitoring Cable (14", 5-pin)
- Data Ribbon Cable (20" ribbon)
- (9) M3.0 x 10mm Black Pan-Head Screws
- (1) Bracket
- (1) M3.0mm Flat Washer
- (1) M3.0mm Lock Washer
- (1) M3.0mm Nut
- (2) Ribbon Cable Retaining Clips

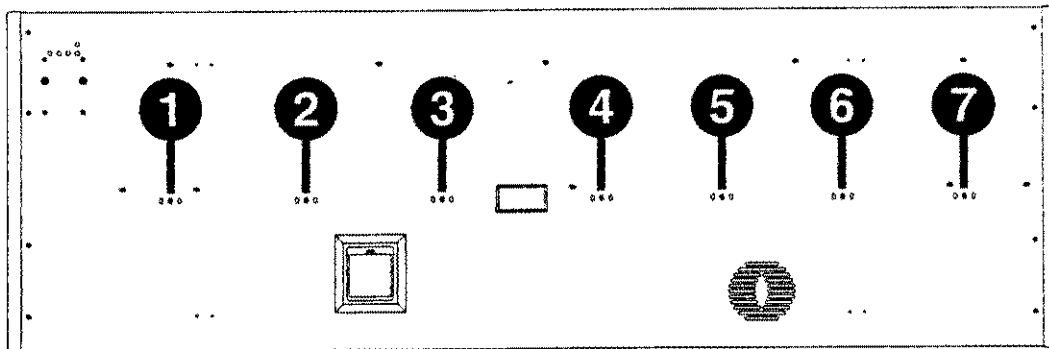
*Not used if this unit is equipped with a KDFX Board.

Beginning The Installation

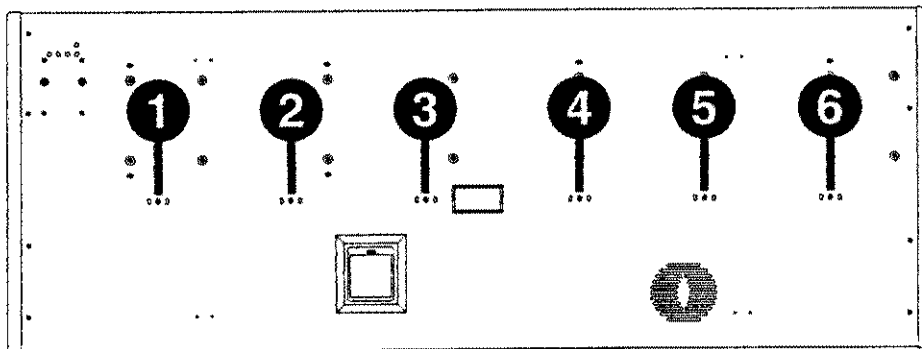
The installation procedure is divided into four parts: Disassembly, Setup, Installation, and Reassembly.

1. Unplug all external wires, cables, and connectors from the K2500 and turn the unit so the keyboard is facing you.
2. Tilt the entire unit onto a soft surface, so that it rests on its rear panel. Using a #2 Phillips screwdriver, remove the screws on the bottom of the unit, as shown in the following figure. The

K2500 has six screws, while the K2500X has seven; each screw may be in any one of the three slots of each group along the bottom of the unit.



K2500X (88 Keys)



K2500 (76 Keys)

Figure 1.

3. Tilt the K2500 so it again rests on its bottom. Then use a #2 Phillips screwdriver to remove the 11 screws on the rear panel of the unit, as shown in the following figure. Be careful to remove only the screws indicated.

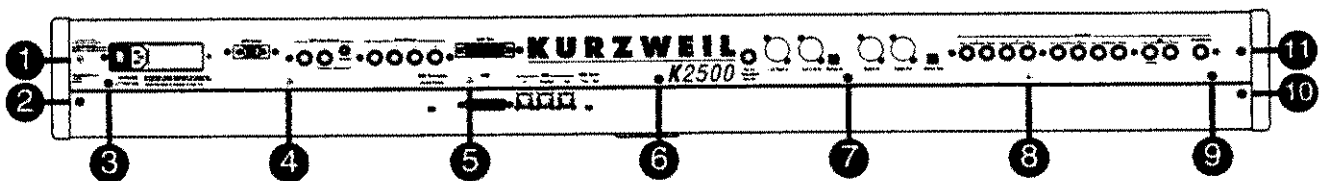


Figure 2.

4. Place two 3" high foam blocks (or other soft items) behind the K2500; again, these blocks will prevent damage to the K2500's sliders and alpha wheel. This will also give you access to the rear-panel jacks.

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5. Push the top cover with your thumbs, as shown below. You will feel the top become unlocked, and it should slide back about 1/2".

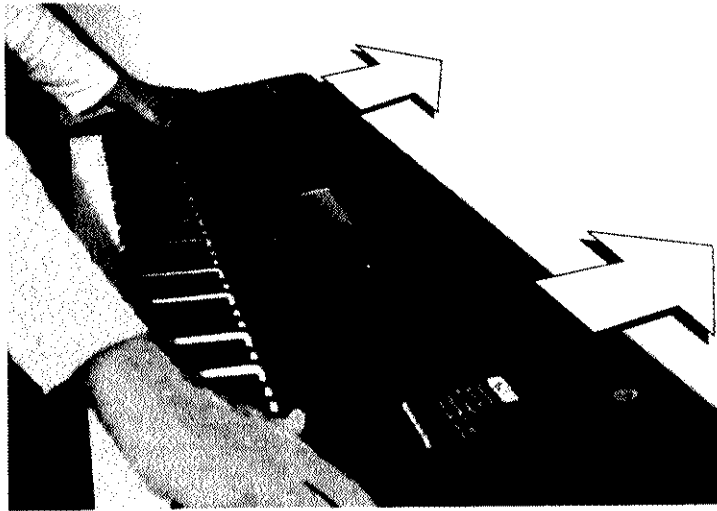


Figure 3.

6. Lift the top cover up, then slide it to the right, as shown in the following figure.



Figure 4.

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7. Once the top cover is free, slide your fingers under the felt attached to the front edge of the top, as shown below. Then tilt the top cover back, placing it up-side down on the two foam blocks. The underside of the K2500's top should now face you, exposing the circuit boards for service.



Figure 5.

8. Determine if this K2500 is equipped with a KDFX Board. If installed, the KDFX Board is attached to the top of the Engine Daughter Board (see Figure 6). Remove the four screws that hold the KDFX Board in place. Arrows in Figure 6 point to the four screws.

Grasp the sides of the KDFX Board, then remove it from the Engine Daughter Board by gently rocking it back and forth until the pins are pulled out of the socket on the Engine Daughter Board.

The KDFX Board is attached to the Engine Daughter Board by pins located below connector J1019, which is on the left side of the KDFX Board as you view it from the front of the unit. Don't remove it too quickly or you might bend the pins.

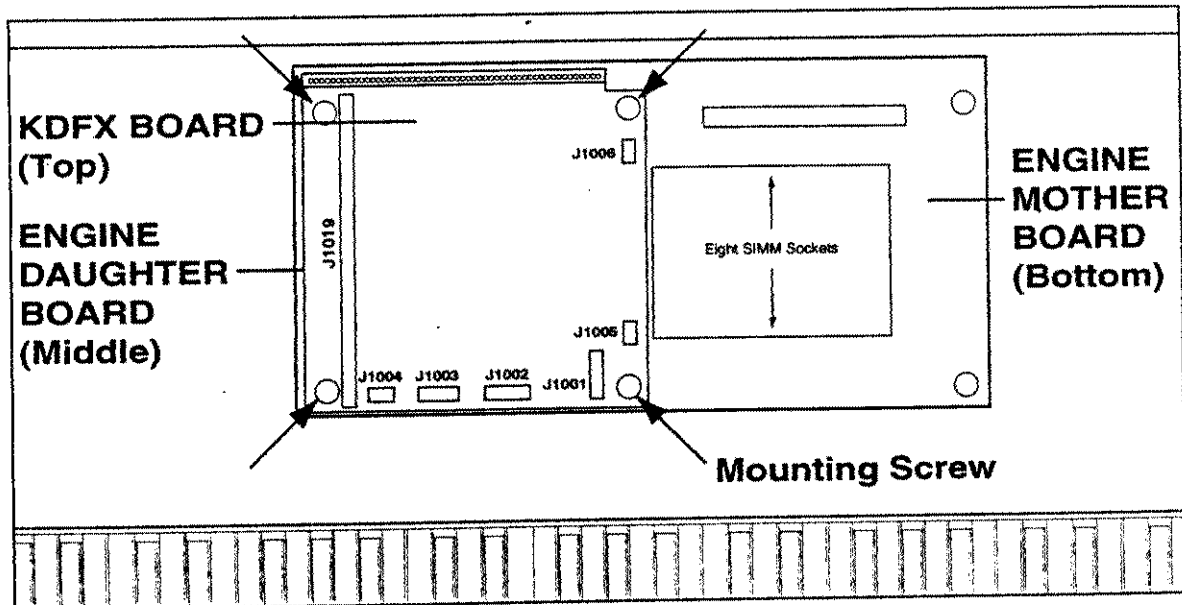


Figure 6.

9. Locate the Engine Daughter Board (see Figure 7). Determine the Engine Daughter Board's revision level, which is printed in white lettering on the left side of the board. If this Engine Daughter Board is REV B, C, D, or E, look for resistor R55 to the left of socket J801. If resistor R55 has not been removed, then follow steps 10 through 14 to remove it from this board. Otherwise, go to the Setup section on page 8.

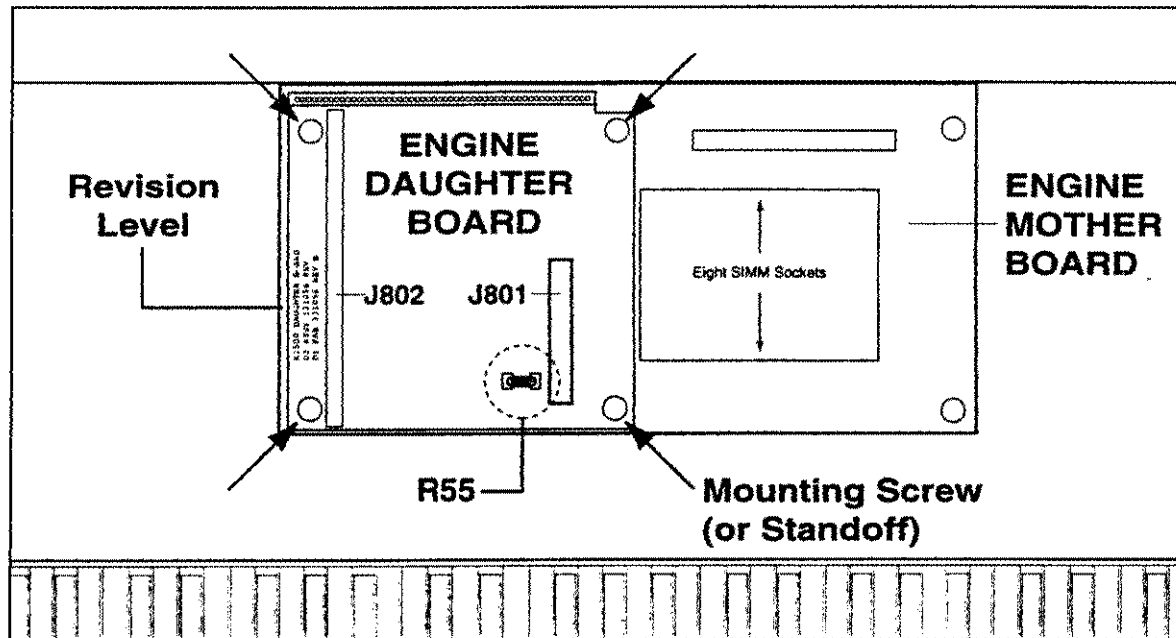


Figure 7.

10. Remove the four screws that hold the Engine Daughter Board in place.
Arrows in Figure 7 show the locations of the four screws. Set them aside after removal; you will use them to reattach the board before you install the Sampling Option Board.

If this K2500 is KDFX-equipped, the Engine Daughter Board is held in place by four standoffs. Using a flat-head screwdriver, remove these standoffs and set them aside.
11. Grasp the sides of the Engine Daughter Board, then remove it from the Engine Mother Board by gently rocking it back and forth until the pins are pulled out of the socket on the Engine Mother Board. The Engine Daughter Board is attached to the Engine Mother Board by pins located below socket J802, which is on the left side of the board as you are viewing it from the front of the unit. Don't remove it too quickly or you might bend the pins.
12. Locate resistor R55, to the left of socket J801. Remove resistor R55 by de-soldering its connections. Then discard this resistor.
13. Reinsert the pins on the bottom of the Engine Daughter Board into connector J919 on the Engine Mother Board.

The best way to do this is to slightly angle the board so that you can position the rear pins first. When the rear pins are correctly located, carefully insert the remaining pins into connector J919. Apply even pressure to the board, then inspect the four holes on the board to make sure that they line up with the standoffs on the Engine Mother Board.

14. Replace and tighten the four Engine Daughter Board attachment screws (or standoffs) that you removed earlier. If this unit is KDFX-equipped, do not replace the KDFX Board; leave it unattached until the installation is complete.

Setup

1. Attach the Bracket to the top of the Sampling Option Board, as shown in the illustration below.

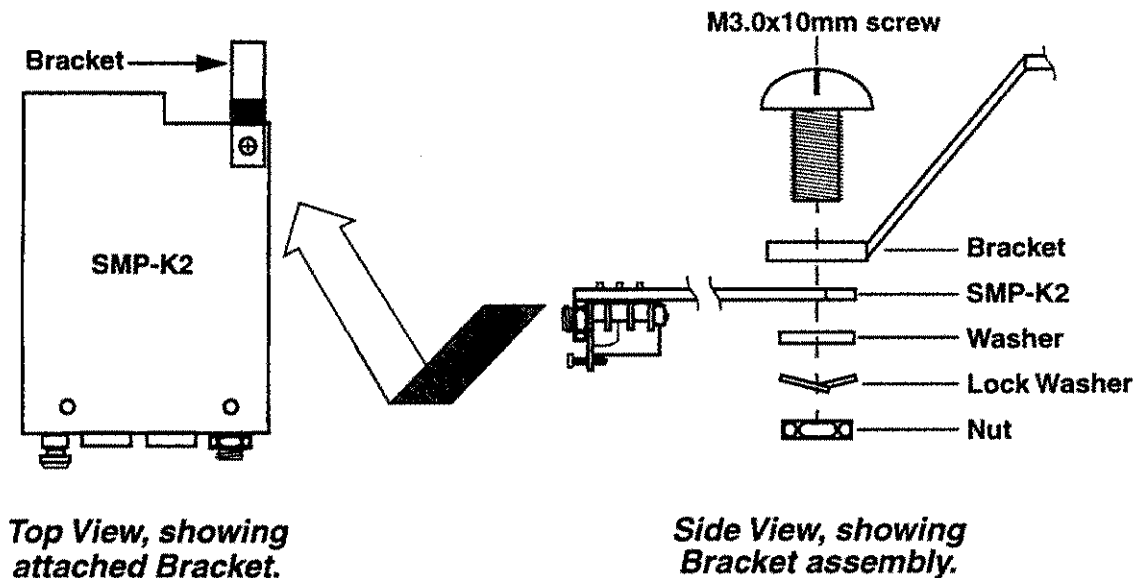


Figure 8. Sampling Option Board Bracket attachment.

2. Locate the Audio Board, to the right of the floppy drive, in the top cover. Bend the Front Panel Cable in J704, as shown in Figure 9, so that this cable does not cover the Keyboard Cable in J702. Bending the Front Panel Cable as shown will allow the Sampling Option Board to fit properly inside the K2500.

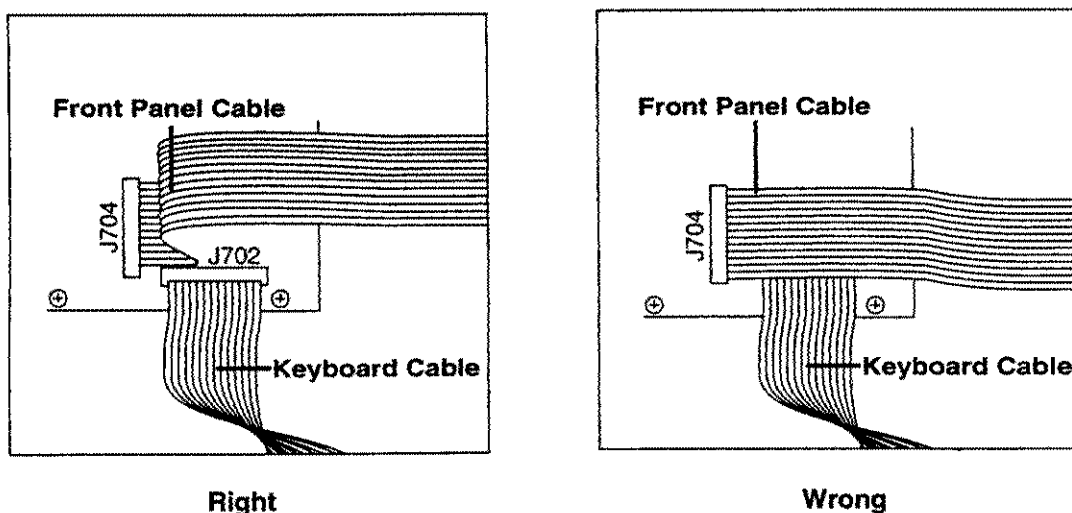
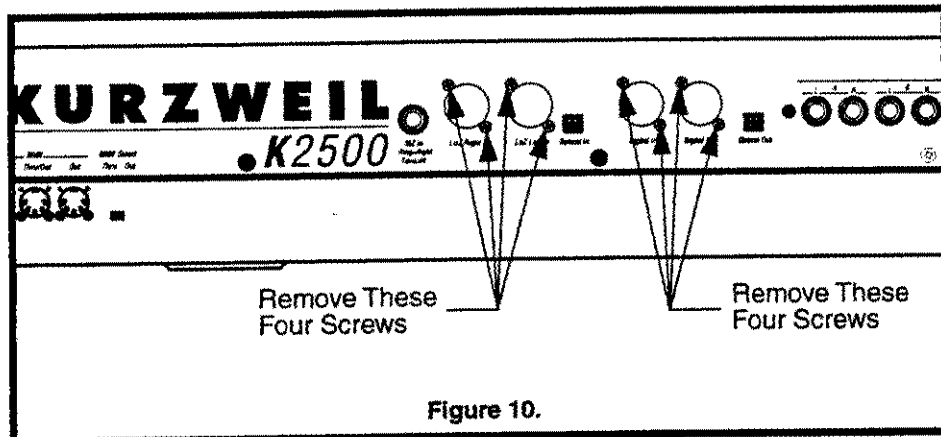


Figure 9. Arrangement of Front Panel Cable on Audio Board.

Installation For Units Not Equipped With the KDFX Option

The following steps apply *only* to units not equipped with a KDFX Board. If this is a KDFX-equipped unit, see the installation steps that begin on page 13.

1. See Figure 10. Using a #2 Phillips screwdriver, remove the eight screws holding the plates behind the rear panel Sampling Option and Digital In/Out holes. Remove these plates and discard them.



2. Plug one end of the 6-pin Digital I/O Cable into socket J1201 on the Digital I/O Board. The connectors on this cable are keyed so that they will only connect to the board one way; however, it does not matter which end of the cable you plug into the Digital I/O Board.
3. Plug one end of the 3-pin Optical Out Cable into socket J1205 on the Digital I/O Board. The connectors on this cable are keyed so that they will only connect to the board one way; however, it does not matter which end of the cable you plug into the Digital I/O Board.
4. Plug one end of the 5-pin I/O Monitoring Cable into connector J706, located on the Audio Board, under the 50-pin Audio Output cable. The connectors on this cable are keyed so that they will only connect to the board one way; however, it does not matter which end of the cable you plug into the Audio Board.
5. Take the Digital I/O Board, remove and set aside the optical connector cap, then position the connectors in the holes in the rear panel of the K2500. Using four M3.0 x 10.0mm black pan-head screws, secure the Digital I/O Board to the rear panel. Now replace the optical connector cap.

Notice in the following figure that the Digital I/O Board cables should bend to the right, and should run along the top cover, on the edge closest to you. The I/O Monitoring Cable should run along the support wall, on the edge farthest from you.

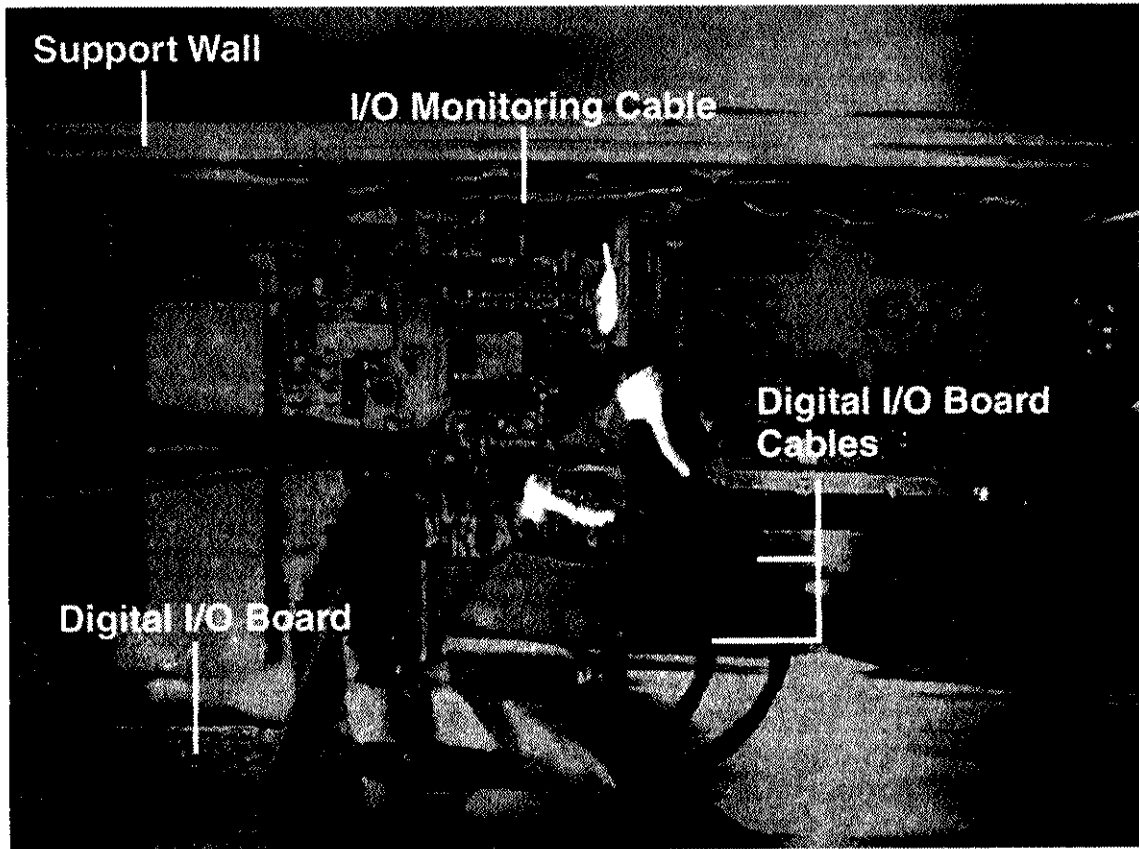


Figure 11.

6. Take the Sampling Option Board, and remove the nut and washer from the 1/4" phone jack and the optical connector cap. Set them aside.
7. Insert the Data Ribbon Cable into socket J1101 on the Sampling Option Board. Make sure you plug the correct end of the Data Ribbon Cable into J1101, as shown in Figure 12. If you plug the wrong

end of the cable into the socket, disconnect the cable and plug the other end in. Then use a Ribbon Cable Retaining Clip to secure the cable to its socket.

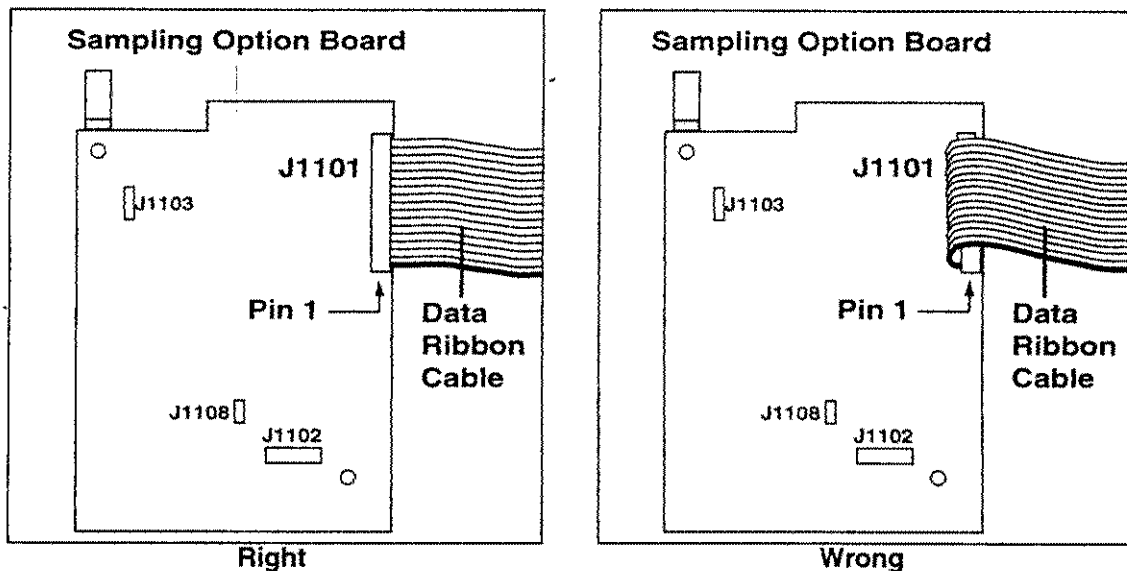


Figure 12.



CAUTION: Be sure that the red border on the ribbon cable, indicating pin one, is plugged into the pin one side of the connectors, indicated by a "1" on the silk screen of the board. Serious damage can result if the cable is not plugged in correctly.

8. Plug the unconnected end of the 5-pin Input/Output Monitoring Cable into socket J1103 on the Sampling Option Board, directly across from J1101.
9. Plug the unconnected end of the 6-pin Digital I/O Cable into socket J1102 on the Sampling Option Board, next to the panel connectors.
10. Plug the unconnected end of the 3-pin Optical Out Cable into socket J1108 on the Sampling Option Board.
11. Take the Sampling Option Board and position the connectors through the rear panel. Make sure that the cable in J1101 comes out of the left side of the board. The Sampling Option Board should fall into place without being forced. Be careful not to flex the board; doing so could loosen its surface-mounted components.

If there is any resistance when you try to put the Sampling Option Board in place, make sure the Digital I/O Board cables are close to the rear panel. Also, make sure once again that the Front Panel Cable is not over the Keyboard Cable (see Figure 9). Look for any other obstructions which may be blocking the Sampling Option Board.

12. Using four M3.0 x 10.0mm black pan-head screws, secure the Sampling Option Board to the rear panel.
13. Replace the optical connector cap, then replace the washer and nut on the 1/4" phone jack.
14. Plug the unconnected end of the Data Ribbon Cable into socket J801, located near the front right-hand side of the Engine Daughter Board. Then use a Ribbon Cable Retaining Clip to secure the cable to its socket.



CAUTION: Be sure that the red border on the ribbon cable, indicating pin one, is plugged into the pin one side of the connectors, indicated by a "1" on the silk screen of the board. Serious damage can result if the cable is not plugged in correctly.

15. Arrange the Engine Link Cable and the Data Ribbon Cable on the Sampling Option Board as shown below.

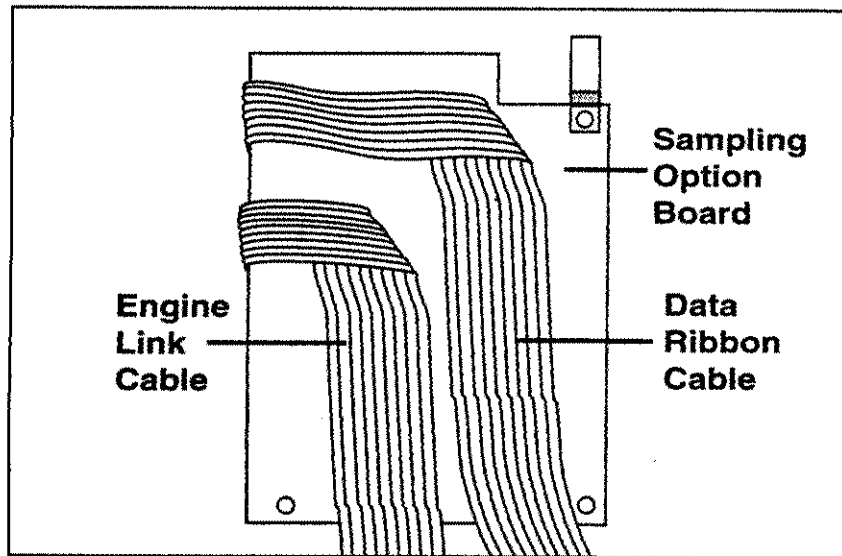


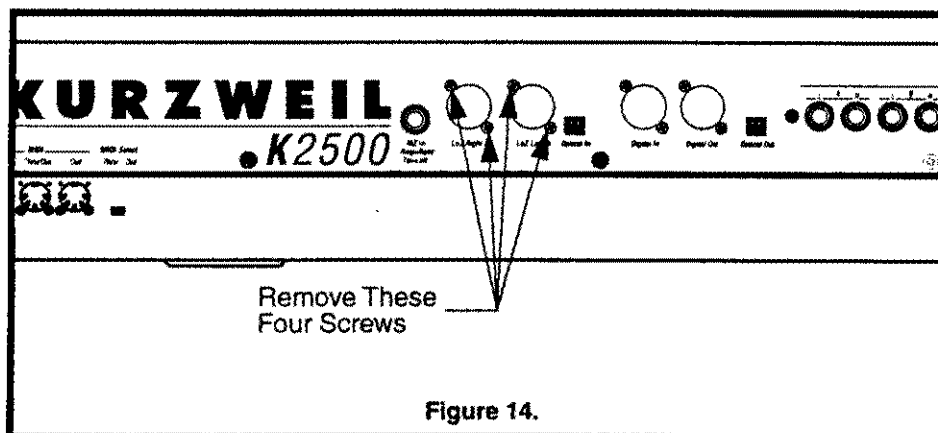
Figure 13.

The installation is now complete. Perform the Reassembly steps beginning on page 16.

Installation For KDFX-Equipped Units

The following steps apply *only* to units equipped with a KDFX Board. Note that in all KDFX-equipped units, the Digital I/O Board has already been installed.

1. See Figure 14. Using a #2 Phillips screwdriver, remove the four screws holding the plate behind the rear panel Sampling Option holes. Remove this plate and discard it.



2. Plug one end of the 6-pin Digital I/O Cable into socket J1003 on the KDFX Board. The connectors on this cable are keyed so that they will only connect to the board one way; however, it does not matter which end of the cable you plug into the KDFX Board.
3. Plug one end of the 3-pin Optical Out Cable into socket J1006 on the KDFX Board. The connectors on this cable are keyed so that they will only connect to the board one way; however, it does not matter which end of the cable you plug into the KDFX Board.
4. Plug one end of the 5-pin I/O Monitoring Cable into socket J706, located on the Audio Board, under the 50-pin Audio Output cable. The connectors on this cable are keyed so that they will only connect to the board one way; however, it does not matter which end of the cable you plug into the Audio Board.
5. Take the Sampling Option Board, and remove the nut and washer from the 1/4" phone jack and the optical connector cap. Set them aside.
6. Insert the Data Ribbon Cable into socket J1101 on the Sampling Option Board. Make sure you plug the correct end of the Data Ribbon Cable into J1101, as shown in Figure 12. If you plug the wrong

end of the cable into the socket, disconnect the cable and plug the other end in. Then use a Ribbon Cable Retaining Clip to secure the cable to its socket.

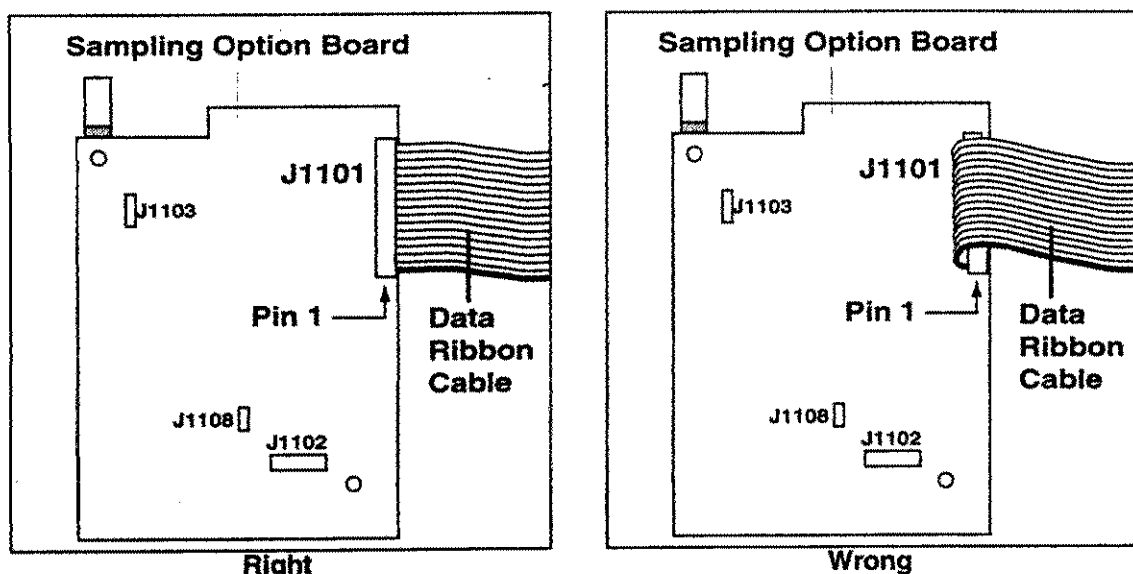


Figure 15.



CAUTION: Be sure that the red border on the ribbon cable, indicating pin one, is plugged into the pin one side of the connectors, indicated by a "1" on the silk screen of the board. Serious damage can result if the cable is not plugged in correctly.

7. Plug the unconnected end of the 5-pin Input/Output Monitoring Cable into socket J1103 on the Sampling Option Board, directly across from J1101.
8. Plug the unconnected end the 6-pin Digital I/O Cable into socket J1102 on the Sampling Option Board, next to the panel connectors.
9. Plug the unconnected end of the 3-pin Optical Out Cable into socket J1108 on the Sampling Option Board.
10. Take the Sampling Option Board and position the connectors through the rear panel. Make sure that the ribbon cable in J1101 comes out of the left side of the board. The Sampling Option Board should fall into place without being forced. Be careful not to flex the board; doing so could loosen its surface-mounted components.

If there is any resistance when you try to put the Sampling Option Board in place, make sure the Digital I/O Board cables are close to the rear panel. Also, make sure once again that the Front Panel Cable is not over the Keyboard Cable on the Audio Board (see Figure 9). Look for any other obstructions that may be blocking the Sampling Option Board.

11. Using four M3.0 x 10.0mm black pan-head screws, secure the Sampling Option Board to the rear panel.
12. Replace the optical connector cap, then replace the washer and nut on the 1/4" phone jack.
13. Plug the unconnected end of the Data Ribbon Cable into socket J801, located near the front right-hand side of the Engine Daughter Board.



WARNING: *Do not* use a Ribbon Cable Retaining Clip to secure the cable to its socket. Doing so will cause the KDFX Board to short out when you turn the K2500 on. The KDFX Board will hold this cable in place.



CAUTION: *Be sure that the red border on the ribbon cable, indicating pin one, is plugged into the pin one side of the connectors, indicated by a "1" on the silk screen of the board. Serious damage can result if the cable is not plugged in correctly.*

14. Arrange the Engine Link Cable and the Data Ribbon Cable on the Sampling Option Board as shown below.

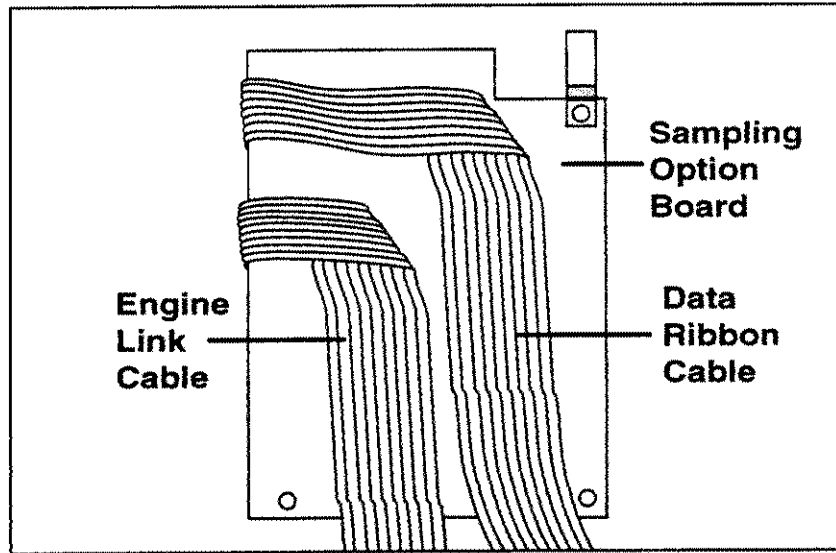


Figure 16.

15. Replace the KDFX Board on the Engine Daughter Board.

The best way to do this is to slightly angle the board so that you can position the rear pins first. When the rear pins are correctly located, carefully insert the remaining pins into connector J802 on the Engine Daughter Board. Apply even pressure to the KDFX Board, then inspect the four holes on the board to make sure that they line up with the standoffs on the Engine Daughter Board.

16. Reinsert and tighten the four KDFX Board attachment screws you removed earlier.



NOTE: *This K2500 now contains a large number of cables. Take a few moments to carefully arrange all the cables; this will prevent damage to the K2500's components when you replace the top cover.*

The installation is now complete, and you can reassemble the unit.

Reassembly

1. When you have completed all connections, tilt the top cover back onto the body of the K2500. First, slide the left end into place, making sure to fit the Floppy Disk Bezel under the left end cap. Figure 17 illustrates the right and wrong way to fit the Floppy Disk Bezel.

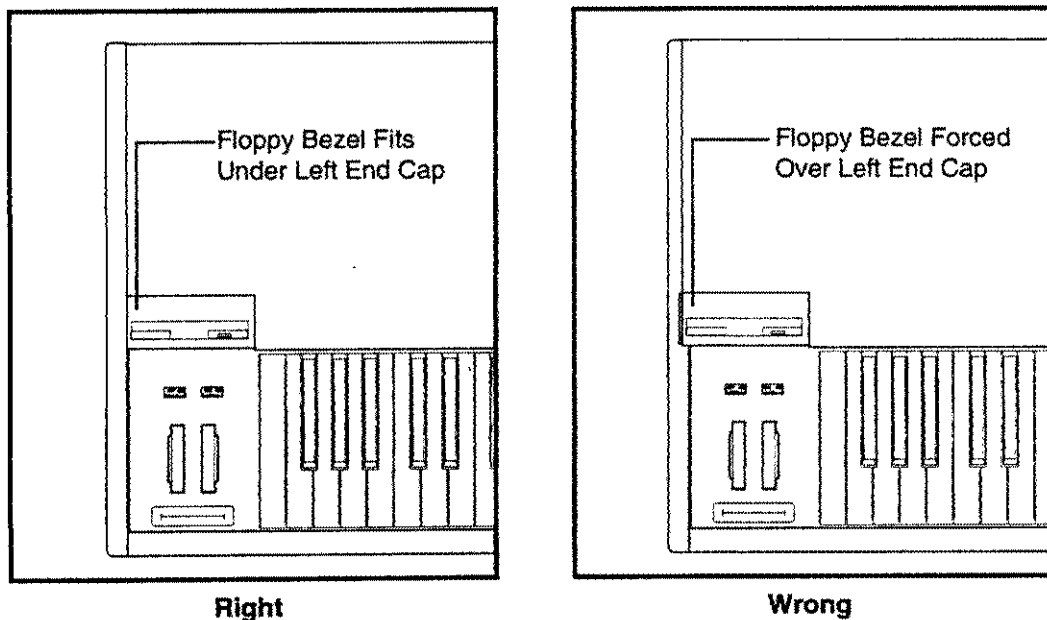


Figure 17.



CAUTION: Before you lower the right end of the top cover, be sure that no ribbon cables are covering the fan on the right side of the unit.

2. Now lower the right end until it falls into place; be careful not to scratch the right end cap. If you feel any resistance, lift the top cover and look for cables which may be obstructing it.
3. Pull the top cover toward you until it locks securely in place.
4. Replace the 11 screws you removed from the rear panel of the K2500. Then tilt the unit back, and replace the screws in the bottom of the unit. The bottom screws are self-threading, so to avoid stripping the threads, start the screws by hand before using a screwdriver. If a thread does become stripped, use an adjacent screw hole.
5. Run the Sampling Option diagnostic tests, as described in the following steps. You will need the following cables to run the diagnostics:
 - (2) Analog Audio Patch Cables - 1/4" mono phone plug to male XLR connector
 - (1) Digital loopback cable - XLR male to XLR female
 - (1) Optical cable - 12" or longer
6. Turn the volume on the K2500 all the way down. Then, remove all cables from your K2500 except the AC power cord and the cables that are specifically needed for the diagnostics. The Sampling Option diagnostics generate high amplitude sounds which could harm you and your sound system. The test will also give you false fail results if all cables are not removed.
7. If the K2500 is on, press the Power switch to turn it off, since you will need to restart the K2500 to run the diagnostic tests.
8. Start the K2500 by pressing the Power switch to turn the unit on.

-
9. Press and release the Exit button while the "Please wait..." message is displayed. This will bring up the K2500 Boot Loader (as shown below), which lets you run diagnostics.

```
----- K2500 Boot Loader v1.01 -----  
  
Install System      Hard Reset  
Install Objects    Run Diags  
Run System         Fixed Diags  
  
OK
```

10. The Boot Loader's Menus resemble K2500 dialog boxes. They consist of a series of labels and a highlight bar you use to select a label. Use the arrow buttons to highlight "Run Diags". Then press the OK soft button to run the diagnostic tests.
11. Press any button to continue when the RAM erasure message appears.
12. Choose "SamplingOpt" from the Diagnostics menu.
13. Choose "Keybd".
14. Choose "Test complete sampling option"
15. You will be prompted to attach cables to the K2500 for the sampling option tests. When you see the prompt "Insert a pair of patch cables from audio output pair B to the balanced inputs of the sampling option", attach one of the patch cables from the left B output (on the rear panel of the K2500) to the left XLR input on the rear panel of the K2500. Connect the other patch cable from the right B output to the right XLR input on the rear panel of the K2500. Press OK.
16. You will next be prompted to "Insert a coax digital-audio loopback cable". This cable has a female XLR connector at one end and a male XLR connector at the other. Connect this cable between the two XLR connectors (labeled "Digital In" and "Digital Out") on the rear panel of the K2500. Press OK to begin testing.
17. After some of the diagnostic tests have completed, you will be prompted to "Remove the coax digital-audio loopback cable, and insert an optical digital-audio loopback cable." At this time you should remove the cable connecting the two XLR connectors on the rear of the K2500. Then, connect an optical cable from the K2500's Optical In jack to the K2500's Optical Out jack. Press OK to resume testing.
18. When the diagnostic tests finish running, a message will appear telling you if the tests passed or failed. If any of the tests have failed, turn off power and review the installation procedure for any errors. When the diagnostics complete successfully, continue with the next step.
19. After completion of the diagnostic check, power down and up again, going into normal operation. Press the "MASTER" button followed by the "Sample" soft button. You should now be on the sampling page. Insert a stereo analog source into the 1/4 inch HiZ jack on the rear panel of the K2500. This could be from a CD or tape player. Select "Input: Analog" with the Alpha Wheel, set "Src:" to "Ext", then Select "GAIN" and adjust the Alpha Wheel until the Level Meters indicate a signal with no "CLIP" indication (The Master LED will also flash when clipping occurs).
20. Insert headphones into the K2500 headphone jack or playback equipment into the "MIX" outs. Turn the volume up to a useful level. Source material should go on and off when "MON" is changed from "On" to "Off" with the Alpha Wheel. Make sure that right/left channel input is coming out of the right/left channel output and that the signal is not distorted. If channels are reversed, missing, or distorted, check the cable connections to the Audio, Engine, and SMP-K2 Boards.

This completes the testing of the SMP-K2 Sampling Option.