

Elecraft K3

Removing/Replacing the DSP Board

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Introduction

The K3's front panel assembly may be removed as a single unit to gain access to the main DSP board, the auxiliary DSP board (present if the KRX3 subreceiver is installed) and the front panel board.

Removing the Front Panel Assembly

- Disconnect power and all cables from your K3.
- Remove the nine screws to free the top cover as shown in Figure 1. After the cover is open, lift it gently to reach the speaker wire connector. Unplug the speaker and set the top cover aside in a safe place.

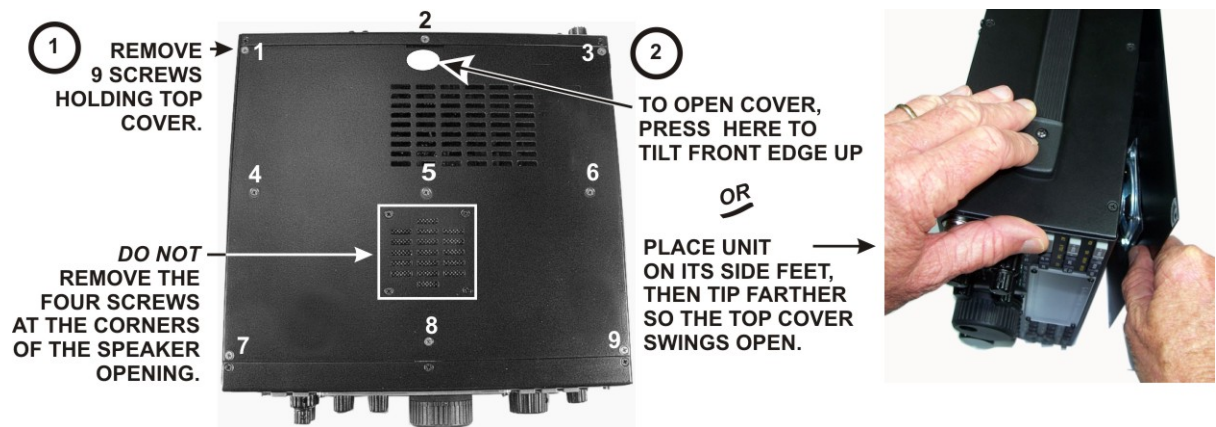


Figure 1. Removing K3 Top Cover.

⚠ CAUTION: Touch an unpainted metal ground or wear a grounded wrist strap before touching components or circuit boards inside the K3.

- If the K144XV 2-meter option is installed, do the following, otherwise skip to the next step:
 - Remove the stiffener bar that runs across the top of the K3. It is held in place by a screw at each end and, if your K3 is equipped with the 100 watt power amplifier option, by two screws attaching it to the shield around the amplifier module.
 - Disconnect all of the cables leading to the module mounted near the top of the left side panel.

Stand the K3 on its side feet and remove the seven screws shown in Figure 2. Do not remove the three larger K144XV mounting screws. Lift the left side panel off (and attached K144XV module if installed) and set it aside in a safe place.

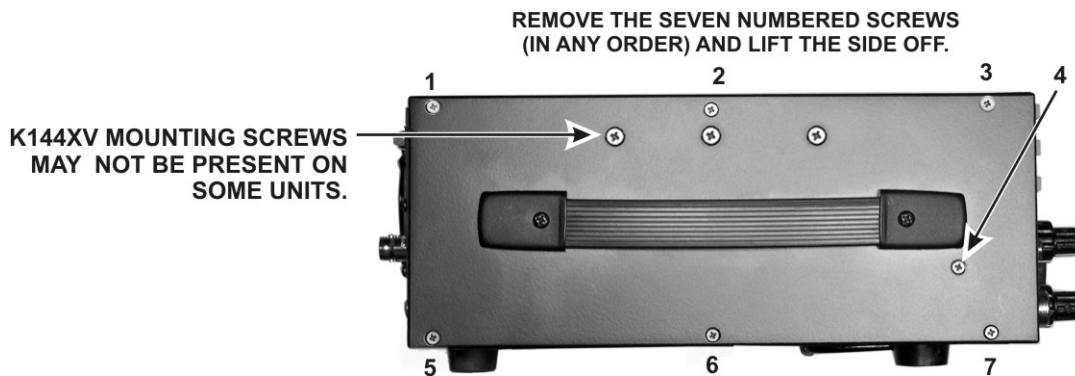


Figure 2. Removing the Left Side Panel.

Remove the screw shown in Figure 3. It is located directly behind the front panel microphone connector. There may be a lock washer under the screw. If so, save it with the screw. Removing the screw ensures the pc boards on the front panel assembly will have adequate clearance when the front panel assembly is removed in a later step. Remove only the screw shown. Leave the other screw in place as shown in the figure.

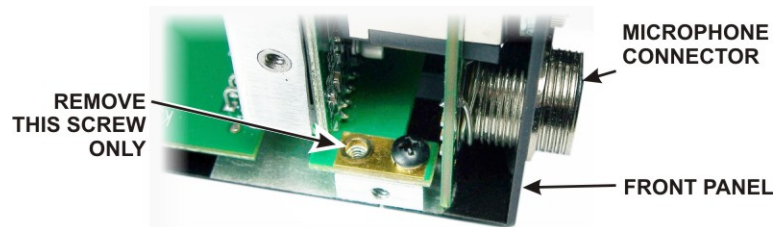


Figure 3. Removing the 2D Screw.

Remove the three screws securing the top of the front panel assembly as shown in Figure 4.

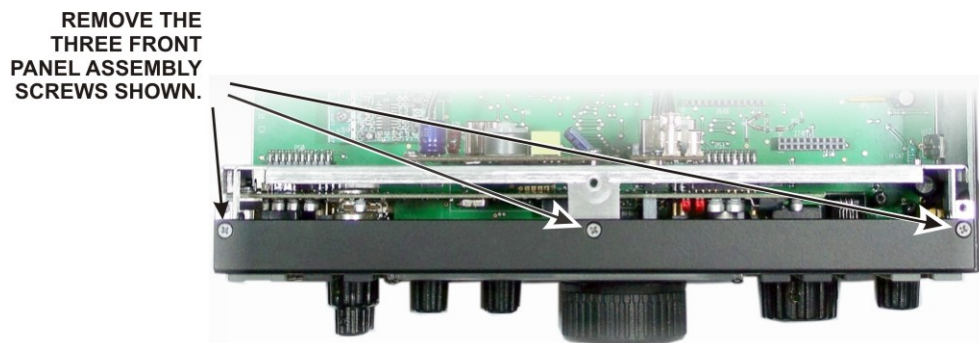


Figure 4. Removing the Top Front Panel Screws.

Turn the K3 upside down. Place it on a clean, soft surface to avoid scratching the top of the front or rear panels.

- Refer to Figure 5 and remove screws 1 through 7, then lift the forward section of the bottom cover off. Put it in a safe place to avoid scratches.

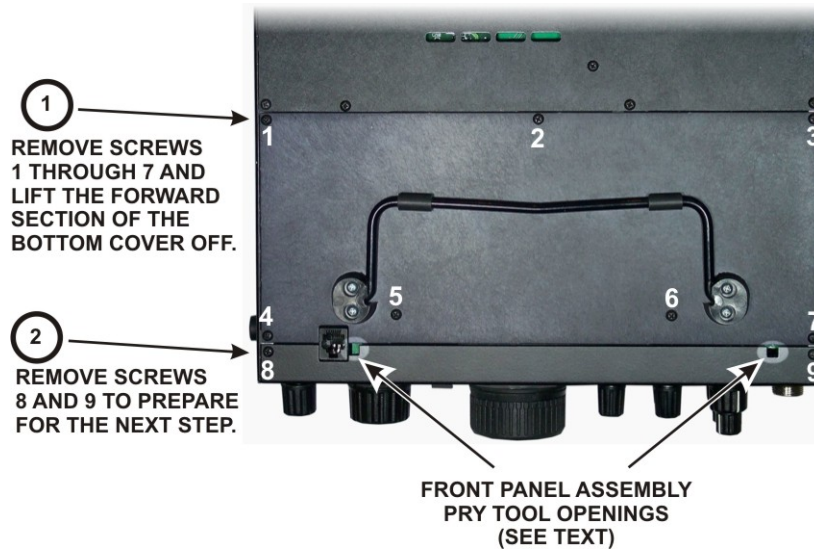


Figure 5. Removing Bottom Cover and Front Panel Assembly Screws.

- Refer to Figure 5 and remove screws 8 and 9 that secure the bottom of the front panel assembly.

⚠ CAUTION: Before continuing on with the next step, be sure you have removed the three top Front Panel Assembly screws shown in Figure 4. You may bend and damage the front panel or shield assemblies if the screws are not removed!

- Use a screwdriver in the pry tool openings to press back against the circuit board while pushing the lip on the front panel assembly toward the front as shown in Figure 6. **Do not insert the screwdriver any farther than necessary to avoid damaging components!** When you have the front panel assembly free, set the main chassis aside in a safe place.

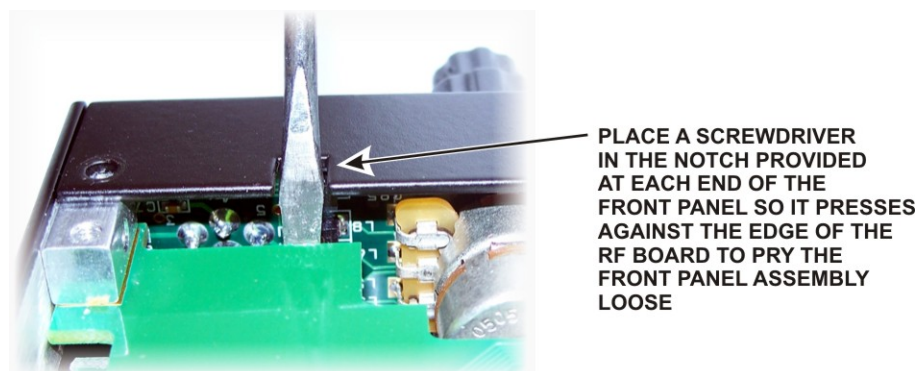


Figure 6. Separating the Front Panel Assembly from the Chassis.

On the front panel, remove the knurled nut from the PHONES jack directly above the MIC connector (see Figure 7). Be very careful not to scratch the paint on the front panel.

Place the front panel assembly face down on a smooth, clean soft surface to avoid scratches to the LCD cover or front panel paint



Figure 7. Phones Jack Knurled Nut.

⚠ CAUTION: The boards are especially vulnerable to ESD damage when unplugged. Wear a wrist strap or touch an unpainted metal ground frequently when handling the boards to avoid ESD damage.

Remove the three screws and split lock washers shown in Figure 8. Depending upon the options you have installed there may be hardware filling the other holes. Remove only the three screws shown.

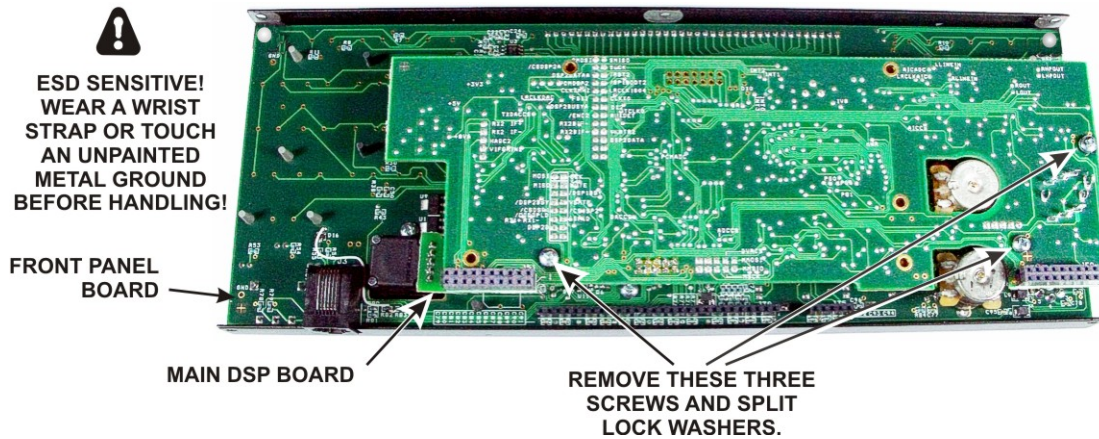


Figure 8. Removing DSP Board Assembly.

With the three screws removed, the main DSP board is held on to the front panel board by two multi-pin connectors. Slip your finger tips between the boards and pull the main DSP board away from the front panel board to unplug it.

A large, thick spacer washer should be lying on the front panel near the hole for the phones jack (see Figure 9). This spacer fits between the phones jack and the back of the front panel board to provide a solid mechanical ground connection when the boards are in place. Remove the washer and set it aside. If it's lying on the inside of the front panel you can tip the panel so it will slide out at the end.

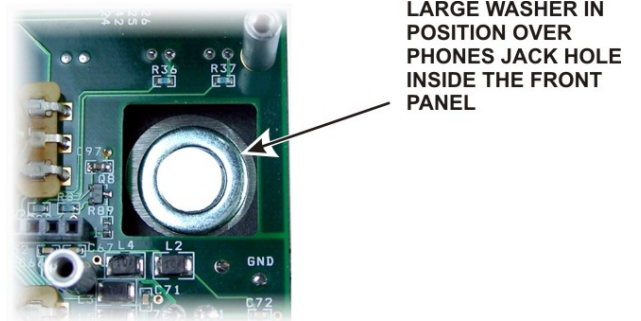


Figure 9. Phones Jack Washer.

Auxiliary DSP Board

If you do not have the KRX3 sub receiver installed, skip the following and go directly to **Remounting the Front Panel Assembly** on page 6 to install your new main DSP board. If you have the KRX3 sub receiver installed an auxiliary DSP board is mounted on the main DSP board. The auxiliary DSP board must be moved to the new main DSP board. All of the audio circuits are contained on the main DSP board, so the auxiliary DSP board need not be replaced.

Remove the three nylon screws securing the auxiliary DSP board to the front side of the main DSP board (see Figure 10).

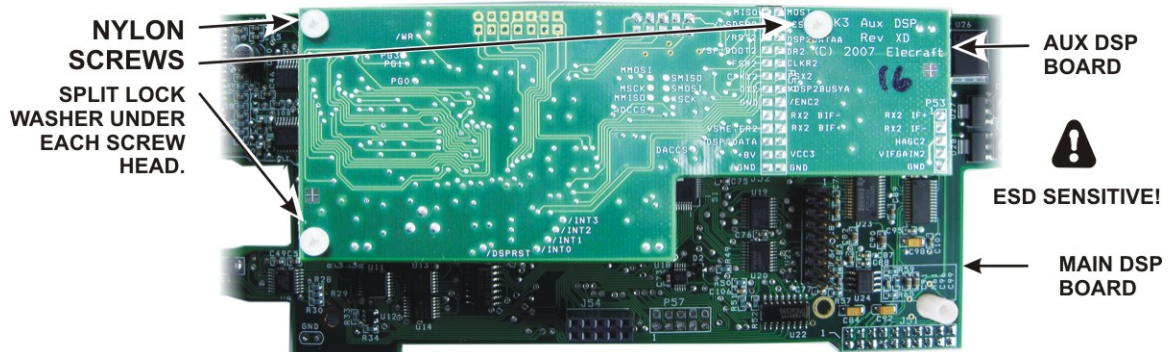


Figure 10. Auxiliary DSP Board.

Unplug the auxiliary DSP board from the main DSP board by slipping your finger tips between the boards and gently prying them apart.

Transfer the three standoffs and their hardware to the new main DSP board. Be sure you install the hardware exactly as shown in Figure 13). Be sure that:

- The standoffs are on the component side of the board as shown.
- No lock washer is used between the standoff and the board.
- On lock washer is used between the nut and the board.

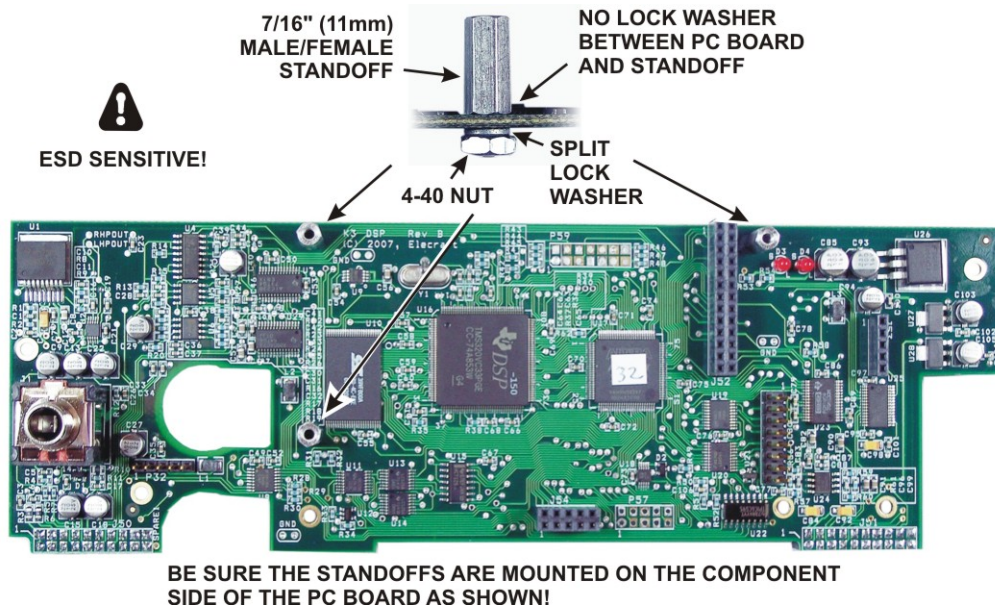


Figure 11. Installing Aux DSP Board Standoffs on the Main DSP Board.

Plug the auxiliary DSP board into the main DSP board by mating P52 and P53 on the narrow end of the auxiliary DSP board with J52 and J53 on the main DSP board. When fully seated, the connectors should be fully engaged so that the pins do not show and the auxiliary DSP board should rest against the top of the standoffs with the holes in the board aligned for the screws. Note that a two-row 10-pin connector at the top of the auxiliary DSP board does not mate with anything on the main DSP board. That is normal.

Secure the board with the three 4-40 1/4" (6.4 mm) *nylon* screws you removed earlier (see Figure 11). Place a split lock washer under each screw head. Do not place washers between the standoff and the pc board. ***Be careful tightening the nylon screws. They are easily stripped!***

Remounting the Front Panel Assembly

- Transfer the nylon standoff to the new DSP board as shown in Figure 12.

⚠ CAUTION: To avoid damaging a circuit trace very close to the metal ring around the screw hole, position the lock washer under the screw so the split faces away from the trace. Tighten the hardware by turning the standoff while holding the screw and lock washer stationary. Do not over-tighten the screw. It is easy to strip the threads in the nylon standoff.

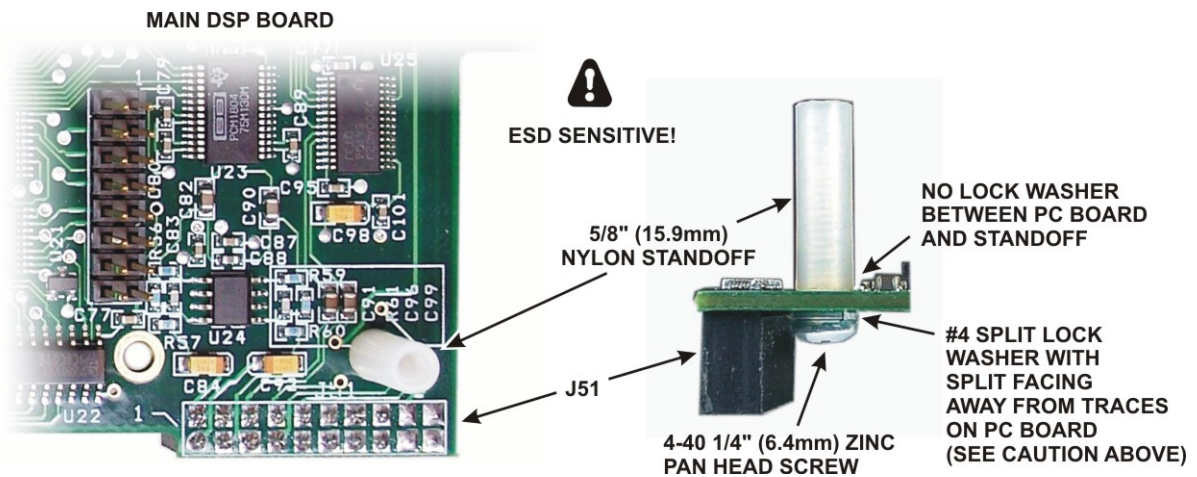


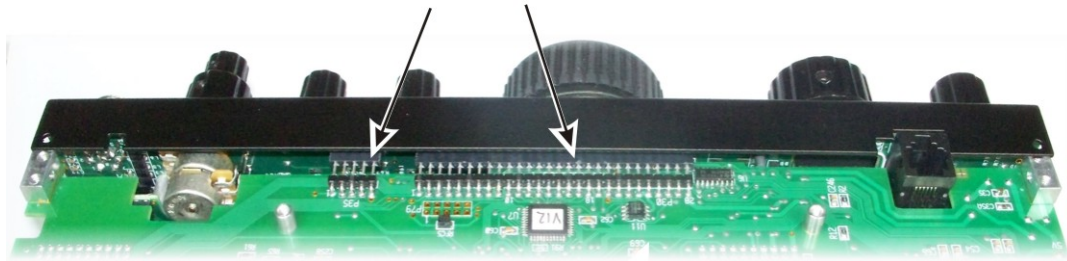
Figure 12. Installing Nylon Standoff on Main DSP Board.

- Mount the new DSP board assembly on the front panel board as follows.
 - Place the front panel assembly face down on a soft, clean surface to protect the finish. The back side of the front panel board should be facing upward.
 - Position the large flat washer on the inside of the front panel over the PHONES jack hole (see Figure 9 on page 5). This is easily done by sliding the washer into place from the end of the front panel.
 - Gently position the DSP board assembly on the front panel board so that the large jack fits through the cutout in the front panel board with the threaded section passing through the large flat washer and the circular opening in the front panel. Adjust the position of the board as needed so you can see the standoffs on the front panel board lined up with the screw holes in the main DSP board. Note: The nylon standoff next to J51 rests against the front panel board, but is not attached to it.
 - Pick up the assembly while holding the DSP assembly board in place and inspect the position of the two male plugs on the DSP board. They should mate with J31 and J32 on the front panel board. J31 is near the encoder for VFO A and J32 is between the two dual potentiometers. Adjust the DSP board's position as needed so the pins enter the corresponding holes in the sockets on the front panel board.
 - Squeeze the boards together while ensuring the pins are mating with the connectors until the DSP board is resting against the three standoffs on the back of the front panel board that you installed earlier. The two connectors will not mate completely. About 1/4" (6.4mm) of the pins may be visible when the DSP board is positioned against the standoffs.

Note: The nylon standoff on the corner of the main DSP board rests against the front panel board. It is not attached to the board.

- Replace the three 4-40 1/4" (6.4 mm) zinc pan head screws you removed earlier with a **split** lock washer under each screw head (see Figure 8 on page 4). Do not use inside tooth lock washers here.
- Replace the knurled nut on the PHONES jack (see Figure 9 on page 5).
- Turn the chassis upside down and position the front panel so the pins of P30 and P35 on the bottom of the RF board just begin to engage the connectors on the lower edge of the front panel assembly as shown in Figure 13). Do not fully mate them yet.

POSITION THE FRONT PANEL ASSEMBLY SO THESE CONNECTORS BEGIN TO ENGAGE, BUT DO NOT TRY TO MATE THEM FULLY YET.

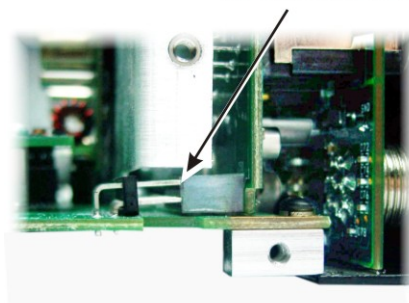


BOTTOM VIEW

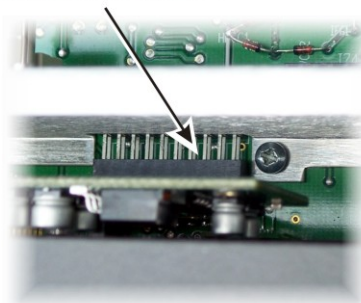
Figure 13. Mounting the Front Panel Assembly- Mating P30 and P35.

- Hold the front panel in place against the chassis assembly and turn the unit over to look at the two multi-pin connectors on the top of the RF board. See if they are engaging the corresponding connectors on the front panel assembly (see Figure 14). Adjust the position of the RF board or the front panel assembly to ensure they are mating properly.

ADJUST POSITION OF FRONT PANEL AND RF BOARD SO THE PINS OF BOTH CONNECTORS ENGAGE



LEFT SIDE (VIEWED FROM END)



RIGHT SIDE (VIEWED FROM TOP)

Figure 14. Mounting Front Panel Assembly - Mating P50 and P51.

- With the pins of all four connectors started, press the front panel onto the RF board connectors. Press only from the bottom of the front panel to avoid flexing the RF board. You can use your fingers to press on the back side of each multi-pin connector on the top of the RF board while holding the front panel to engage them. There may be small areas of pins showing even after they are mated. You will know they are properly mated when the screw holes on the bottom lip of the front panel assembly line up with the screw holes in the 2D fasteners on the bottom of the RF board.
- Secure the front panel assembly at the bottom lip to the 2D fasteners at the forward edge of the RF board with the two 4-40 3/16" (4.8 mm) black pan head screws you removed earlier. No lock washers are used on the external case screws.

- Fasten the top of the front panel assembly with three 4-40 3/16" (4.8 mm) black flat head screws (see Figure 4).
- Replace the 3/16" (4.8 mm) black pan head screw and, if used, lock washer in the 2D fastener (see Figure 3 on page 2).
- Replace the forward bottom cover using seven 3/16" (4.8 mm) black pan head screws (see Figure 5 on page 3).
- Replace the left side panel as follows:
 - Start the six 4-40 3/16" (4.8 mm) black flat head screws through the panel: three along the bottom, one at the top rear, one at the top front, and one just below the front end of the handle. It is normal to adjust the position of the panels slightly when assembling so the screw holes line up. The cabinet will become structurally sound and rigid when all the panels, including the top and bottom covers, are mounted.
 - Tighten all six screws. ***Be sure all the screws are tight, including the screw near the forward end of the handle that threads into the front panel shield.***
- If the K144XV option is installed, replace the chassis stiffener bar, and refer to your K144XV Installation and Operation manual and reconnect all the cables to the module.
- Hold the top cover above the K3, route the speaker wire under the stiffener bar and plug it into P25 on the KIO3 board at the left rear of the K3 as shown in Figure 15.

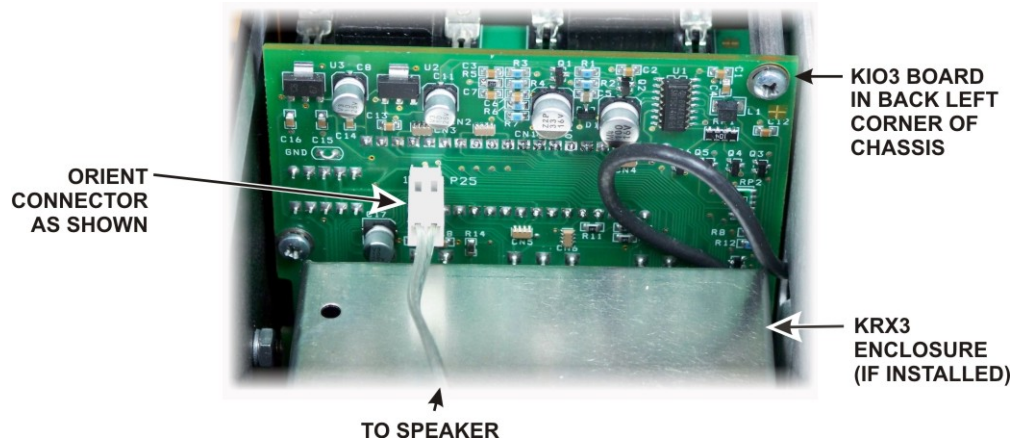


Figure 15. Connecting Speaker Cable.

⚠ IMPORTANT: The cabinet screws are essential for the K3 shielding to work properly. Check all of the cabinet screws including the screws on the left side panel, the three screws at the top of the front panel assembly and the screws on the bottom cover and front panel assembly. Be sure every screw has been replaced and is snug, but do not over-tighten them to point of damaging the screw heads or stripping the threads.