

Elecraft KPAIO3MDKT Installation Instructions

Revision B, August 10, 2016

E740287

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Introduction

This modification applies only to K3S transceivers equipped with the KPA3A 100 watt power amplifier, serial numbers 10732 (factory assembled), 10728 (kits) or below, and to all K3 transceivers with the KPA3 power amplifier that have been upgraded with KSYN3A synthesizers.

Tests at Elecraft have shown that a very small amount of electrical noise associated with the fans on the KPA3 (or KPA3A) amplifier module can be detected in the transmitted signal under laboratory test conditions. This modification suppresses that noise. The noise had always been present, but was only discovered with the addition of the new KSYN3A synthesizer, due to its extremely low phase noise close to the carrier.

This modification was phased into factory assembled units starting with serial number 10732 and kits starting with serial number 10728. This modification kit allows you to make the simple change in the field to an existing K3 or K3S. It requires removing the KPAIO3 interface board and soldering a leaded capacitor supplied onto the board.

If you would like Elecraft to install this modification for you, contact Elecraft technical support at k3support@elecraft.com or call 831-763-4211.

Parts and Tools Required

The only part required is one 470 μ F, 16 VDC electrolytic capacitor, supplied with the kit.

You will need the following tools:

1. A temperature-controlled ESD-Safe soldering station and fine solder.
2. #0 and #1 size Phillips screwdrivers. To avoid damaging screws and nuts, ***do not use a power screwdriver***. Use the screwdriver that best fits the screw in each step.
3. Diagonal cutters.
4. Needle nose pliers are often handy for positioning small parts.

Procedure

Removing the KPAIO3 Interface Board

⚠ A grounded wrist strap and ESD dissipating mat are recommended whenever you work inside your K3. Optionally, touch a bare metal ground frequently while working.

- Disconnect power and all cables from your K3.

☐ Remove the nine screws to free the top cover as shown in Figure 1. After removing the screws, gently lift the cover to reach the speaker wire connector. Unplug the speaker then set the top cover aside in a safe place.

⚠ Whenever you remove screws from a panel, if one screw seems too tight to loosen without damaging it, first loosen the other screws then try again. Sometimes one screw binds in its hole when the other screws are tightened.

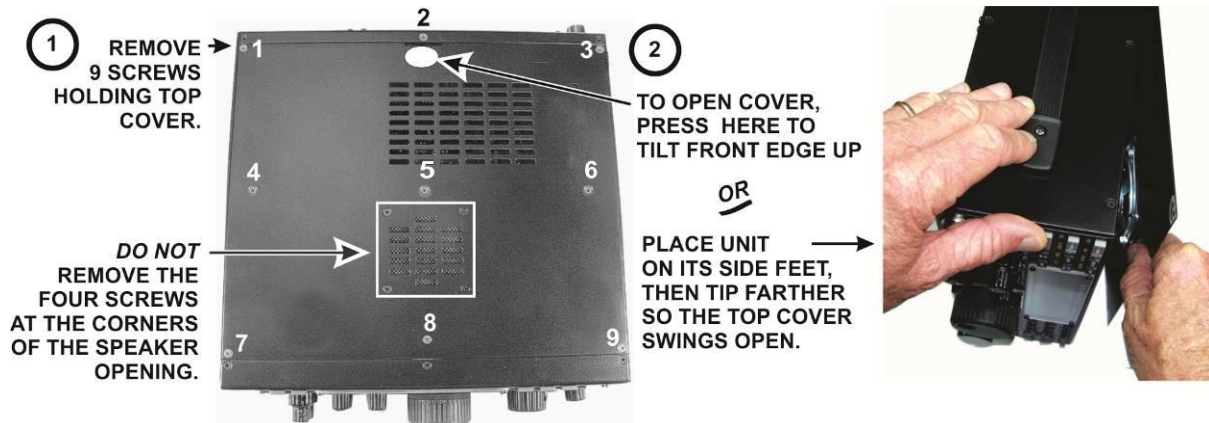


Figure 1. Removing the Top Cover.

☐ Remove the KPA3 fan panel and set it aside (see Figure 2).

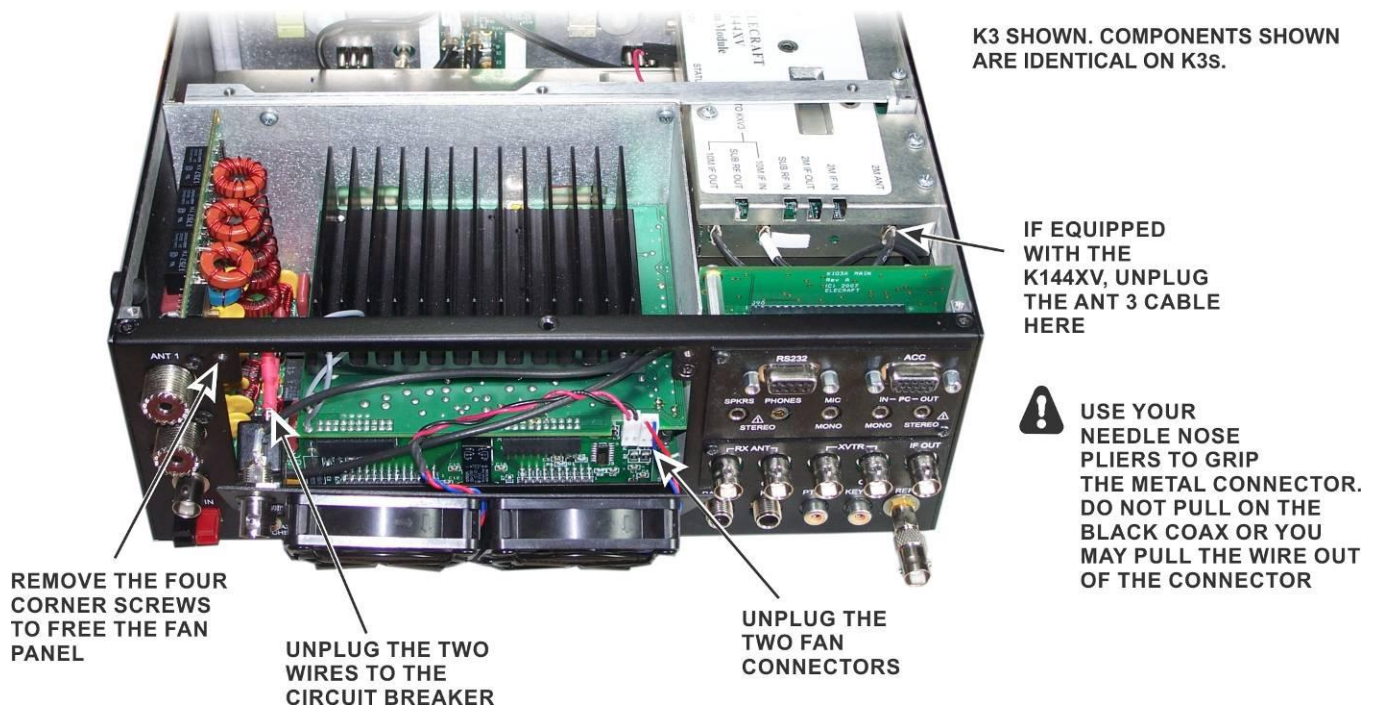


Figure 2. Removing the Fan Panel.

- ☐ Remove the three screws and lock washers holding the KPA3 module in place (see Figure 3)

REMOVE THESE THREE SCREWS AND LOCK WASHERS TO FREE THE KPA3 MODULE

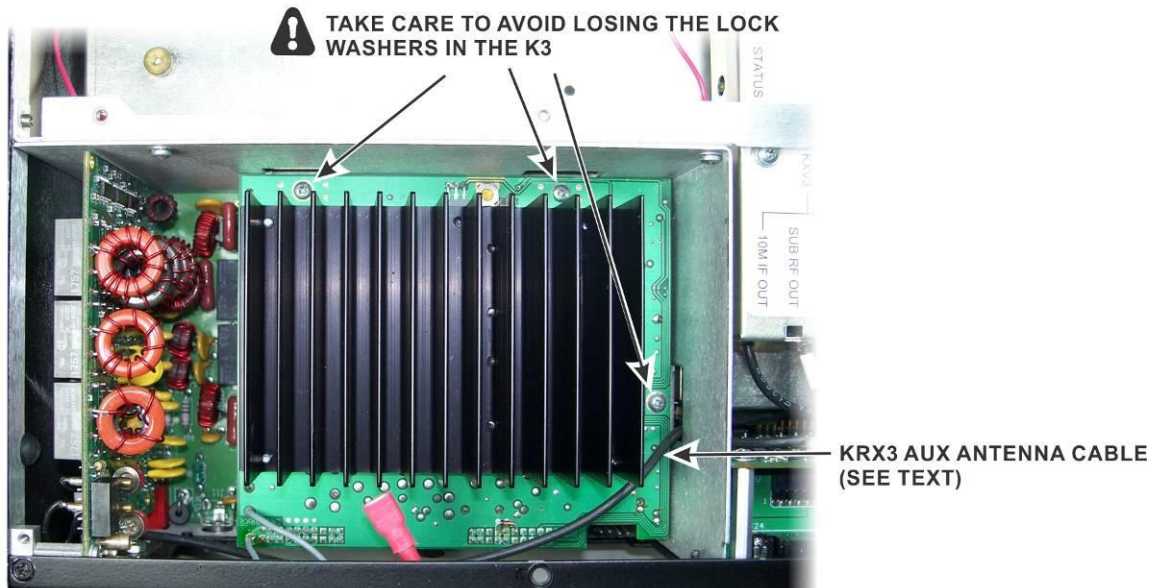


Figure 3. Removing the KPA3 Screws.

! If you have the KRX3 sub-receiver installed and have auxiliary antenna input connected to either the KAT3 or to the rear panel AUX antenna connector, there will a coaxial cable running across the KPA3 module (see Figure 3, above). It is not necessary to remove this cable when removing the KPA3 module. If it runs to the KAT3 antenna tuner, you can unplug it from the tuner if you wish but, in any case, you can remove the KPA3 module with this cable in place. Just route the cable to the rear around the KPA3 module as you remove it, and be sure it is on top of the KPA3 when you reinstall it. You may find that excess cable is between the KRX3 module and the KIO3 board just outside the KPA3 shield area. Pull this cable into the KPA3 shield area to give you enough cable length to work with.

☐ Unplug the KPA3 module from the two multi-pin connectors at the rear edge by placing your thumbs under the back edge of the KPA3 board near the connectors and placing your fingers on the heat sink to gently move the opposite edge of the KPA3 up and down (see Figure 4). This will “walk” the connectors apart, freeing the module.

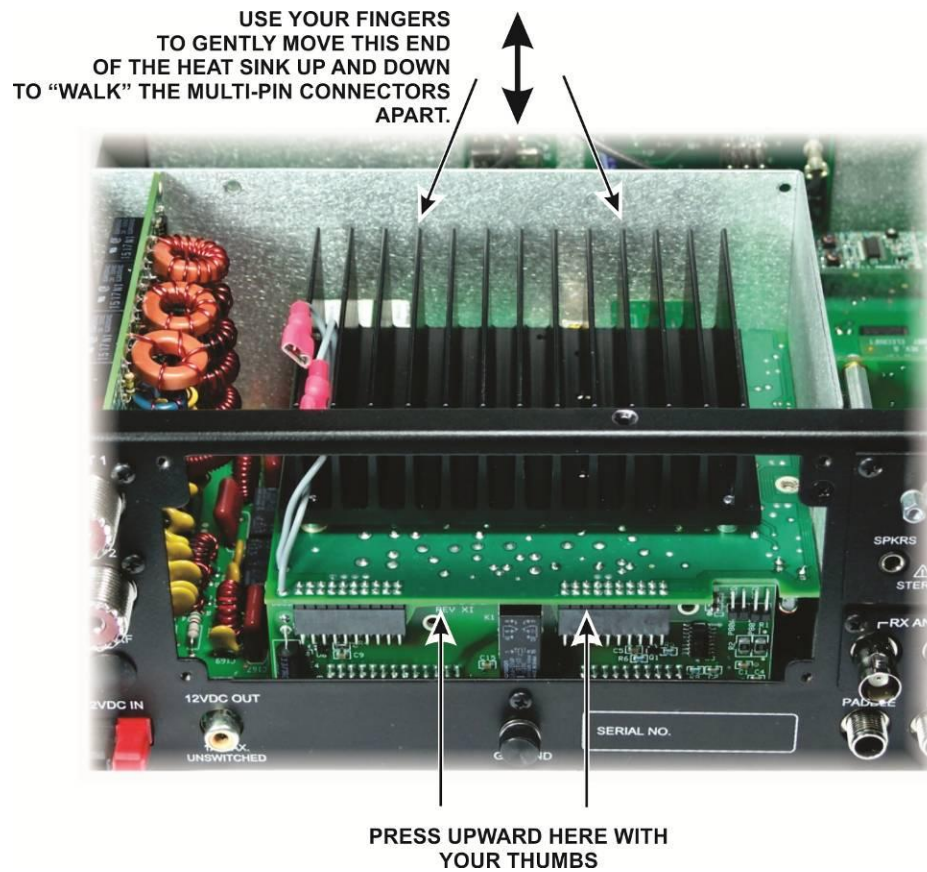
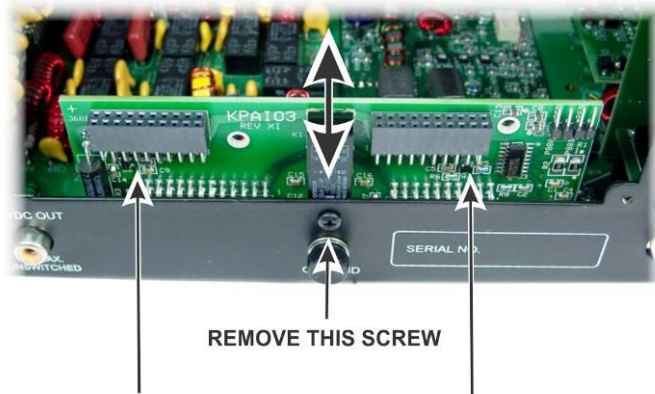


Figure 4. Removing the KPA3 Module.

⚠ Your KPA3 module may produce a rattling sound when shaken. This is normal. It is caused by ferrite beads sliding along wire leads in the module.

- ❑ Remove the KPAIO3 board as show in Figure 5. The KPAIO3 is held in place by the screw shown and two multi-pin connectors mating with connectors on the RF board at the bottom. Remove the screw, and then lift the KPAIO3 board while rocking it back and forth to ‘walk’ the connectors apart, much as you did when removing the KPA3 module.



LIFT UPWARDS WHILE ROCKING THE BOARD
BACK AND FORTH TO “WALK” IT OUT OF THE
MULTIPIN CONNECTORS AT THE BOTTOM

Figure 5. Removing the KPAIO3 Module.

Installing the Capacitor

- ❑ Solder the capacitor on the back of the KPAIO3 module board as shown in Figure 6.

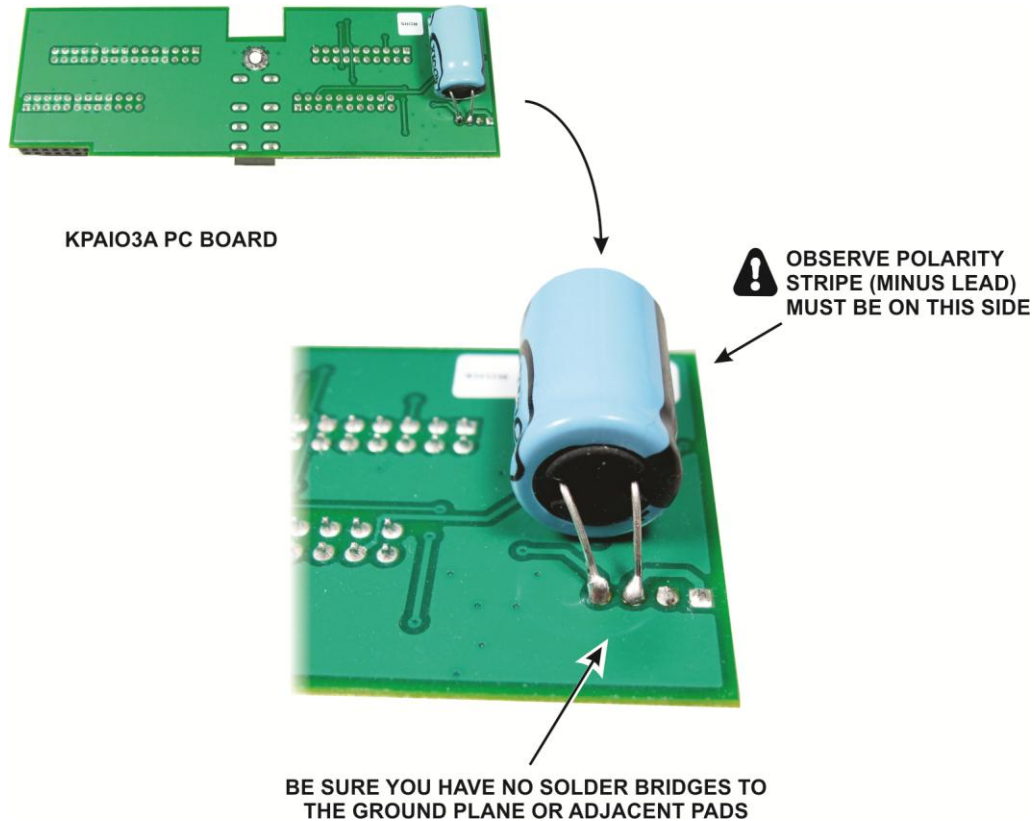


Figure 6. Soldering the Capacitor on the KPAIO3 Module.

Reassembling the K3S

☐ Replace the KPAIO3 board as shown in Figure 7. Press down on one end and then the other while rocking the KPAIO3 board to fully mate both connectors with the connectors on the RF board underneath and then replace the screw that holds the KPAIO3 board.

⚠ If you have a K3 transceiver equipped with a KPAIO3A board rather than the KPAIO3 board, you will find there are fewer pins on P67B on the K3 RF board than holes in the mating connector J67B on the KPAIO3A. This is normal. The KPAIO3A is fully compatible with the K3 but these pins are not used by the K3. Install the KPAIO3A so all of the pins of P67A on the K3 RF board mate with J67B on the KPAIO3A board and the screw hole in the K3 rear panel lines up properly with the threaded standoff on the KPAIO3A board.

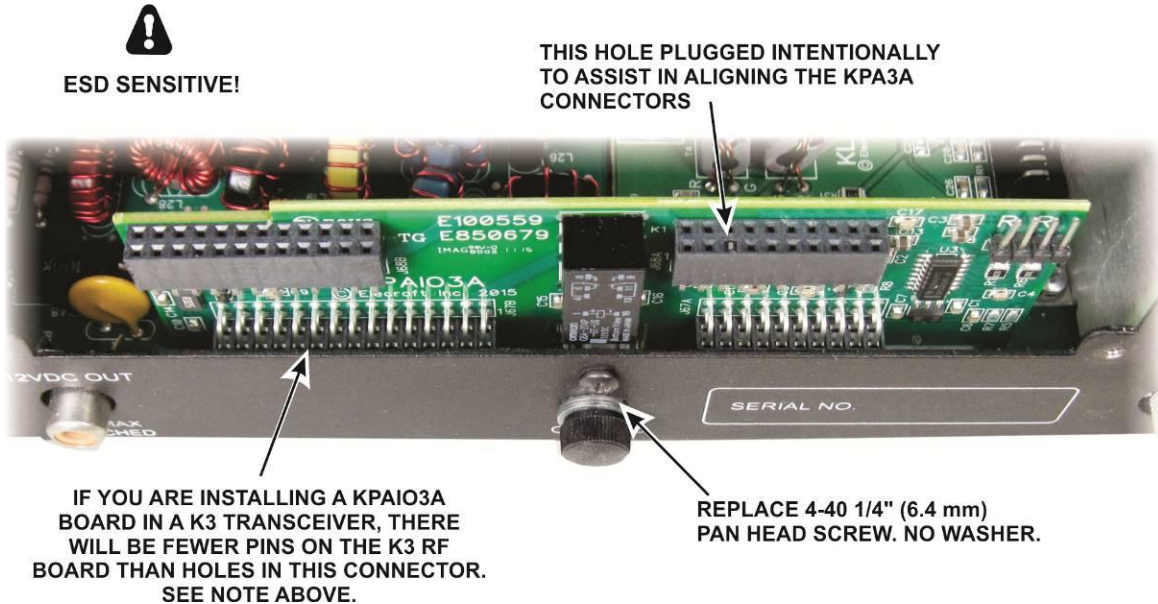


Figure 7. Replacing the KPAIO3 Module.

Place the KPA3 module inside the shield from the top. Note that one pin in the KPA3A connector has been cut off and a plug is in the mating hole on the KPAIO3 board as shown in Figure 7. Mate the two connectors fully with the KPAIO3 board as shown in Figure 8. If the coaxial cable to the KRX3 sub receiver is present running across the KPA3 enclosure, be sure it is routed above the KPA3 board as shown.

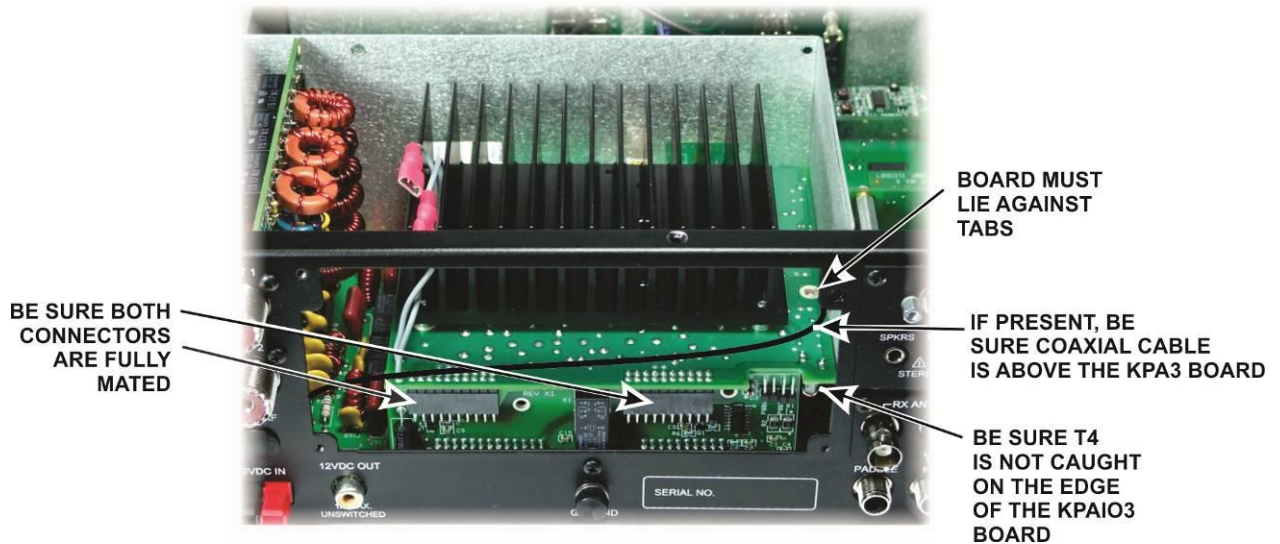


Figure 8. Reinstalling the KPA3 Module.

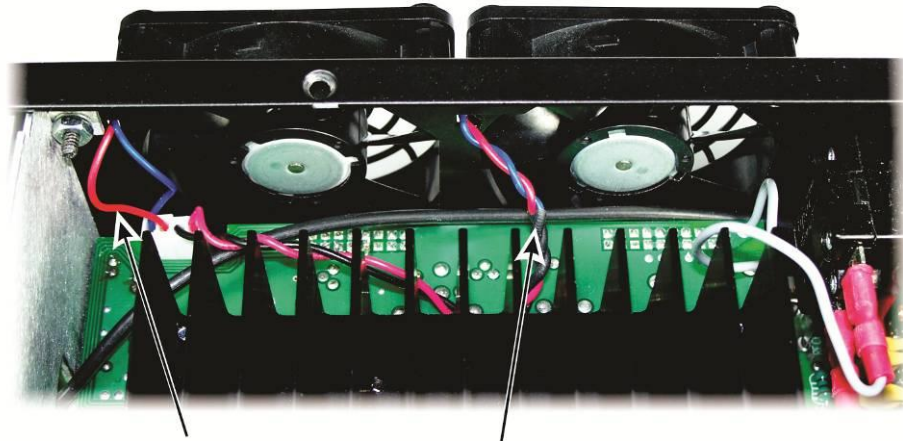
Secure the KPA3 module with the three 4-40, 1/4" (6.4mm) zinc pan head screws and lock washers you removed earlier (see Figure 3).

Replace the fan panel (see Figure 2).

- Be sure the connectors on the circuit breaker fit snugly. If they are loose, squeeze them gently with your needle nose pliers to tighten the fit.
- Orient the fan connectors so the red wires are to the left, looking at the assembly from the rear. The colors are marked on the circuit board as well. Installing them backward will cause the fans to run in reverse, severely limiting the PA cooling.

☐ Dress the fan leads so they are well clear of the blades (see Figure 9). Ensure both fans turn freely. If you have the K144XV 2-meter option installed, a second coaxial cable will run from the ANT3 connector on the fan panel, across the top of the KPA3 board alongside the cable shown.

! BE SURE BOTH FANS TURN FREELY FOR PROPER COOLING

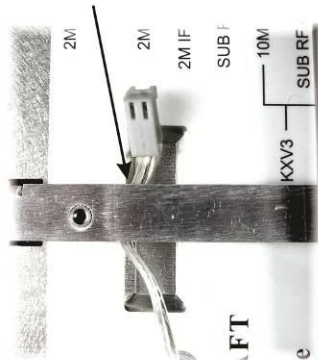


POSITION LEADS SO THEY ARE WELL CLEAR OF THE FAN BLADES.

Figure 9. Positioning the Fan Leads.

☐ Hold the top cover above the K3 and reconnect the speaker wire (see Figure 10), then replace the top cover and secure it with the nine 4-40 3/16" (4.8 mm) black flat head screws you removed earlier.

PASS THE SPEAKER WIRE UNDER THE STIFFENER. IF EQUIPPED WITH THE K144XV 2-METER OPTION, PASS THE SPEAKER WIRE UNDER THE STIFFENER ABOVE THE RECESS IN THE K144XV COVER.



PLUG CONNECTOR INTO KIO3 BOARD ORIENT CONNECTOR AS SHOWN

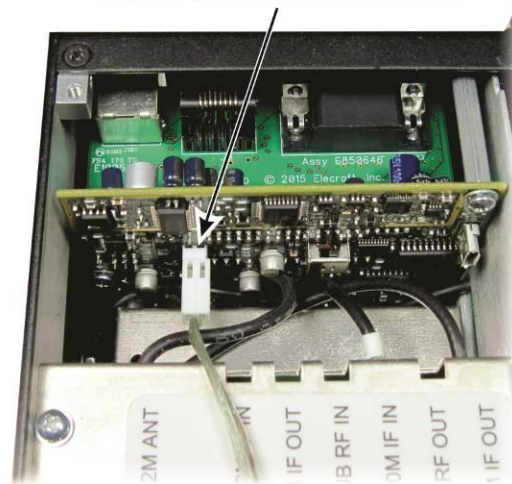


Figure 10. Reconnecting the Speaker Wire.

! REPLACE ALL THE SCREWS!

The K3's chassis has excellent rigidity despite its light weight. The screws that hold the covers in place are an important part of the structural design. Please be sure to replace all the screws and verify they are tight whenever you replace the cover or other panels

That completes the modification.