

# Elecraft K3

## 12VDC OUT Current Modification

Revision C, December 22, 2016

E740176

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### Introduction

This modification raises the current available from the 12VDC OUT connector on the K3 from 0.5A to 1.0A. It involves replacing three components on the K3 RF board: diode D34, choke RFC 48 and resettable fuse F2. This modification applies only to older K3 transceivers. Later K3 transceivers and all K3S transceivers provide 1.0A capability from the 12VDC OUT connector.

### Parts and Tools Required

You will need a temperature-controlled ESD-Safe soldering station, fine solder, and your normal hand tools such as needle nose pliers and diagonal cutters. In addition, you will need de-soldering tools such as a solder-sucker or high-quality de-soldering wick. The action of de-soldering wick is often improved by adding a small amount of pure rosin-based liquid soldering flux.

A kit containing the required parts is available from Elecraft. Order K312MDKT

| QUANTITY | DESCRIPTION                 | ELECRAFT PART NUMBER |
|----------|-----------------------------|----------------------|
| 1        | Choke, 10uH 1.28A           | E690303              |
| 1        | Diode                       | E560063              |
| 1        | Resettable Fuse, 1.1A       | E980223              |
| 1        | Label, 1.0A SWITCHED, Mylar | E980226              |

### Procedure

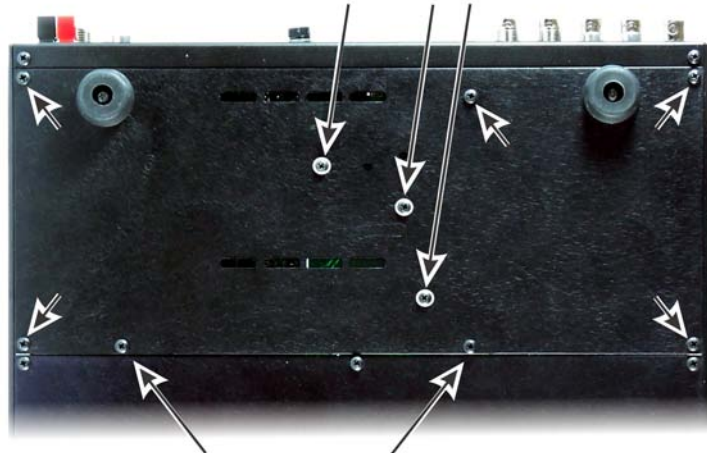
**⚠ A grounded wrist strap and ESD dissipating mat are recommended whenever you work inside your K3. Optionally, touch a bare metal ground frequently while working.**

Disconnect power and all cables from your K3.

**⚠ 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.**

Remove the screws from the rear section of the K3's bottom cover shown in Figure 1. If either of the two screws indicated turns but does not unscrew, the spacer it screws into inside is loose. You'll need to remove the front section of the bottom cover and hold the spacer with long-nose pliers or strong tweezers to remove the screw. Later you will be instructed to remove the K3 top cover. When you do that locate the screw from above the pc board that threads into the spacer and tighten it securely.

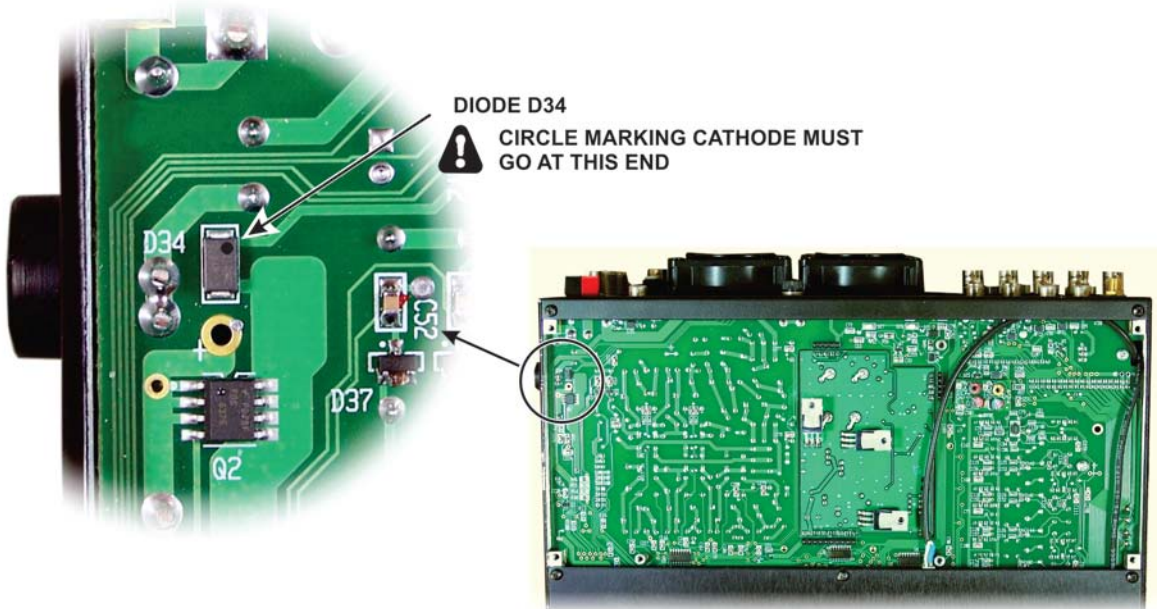
THESE THREE SCREWS HAVE LOCK WASHERS.  
KEEP THE SCREWS AND LOCK WASHERS SEPARATE  
FROM THE OTHERS.



SEE TEXT IF EITHER OF THESE  
SCREWS TURNS BUT DOES NOT  
UNSCREW

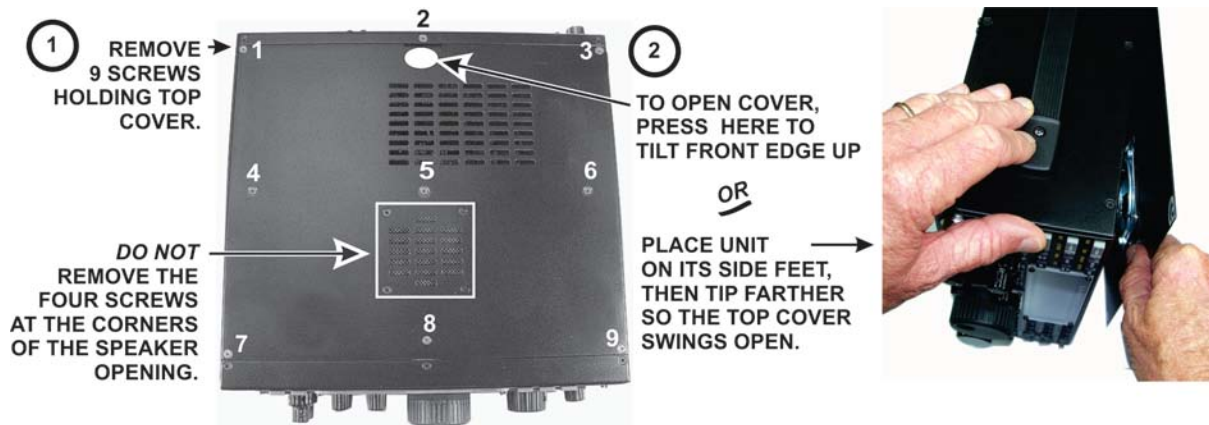
**Figure 1. Removing Rear Section of Bottom Cover.**

☐ Replace SMD diode D34 with the new diode supplied with the mod kit (see Figure 2) . The old diode is easily removed without special SMD handling tools by heating and lifting one end of the existing diode at a time using a thin screwdriver or knife blade under the diode.



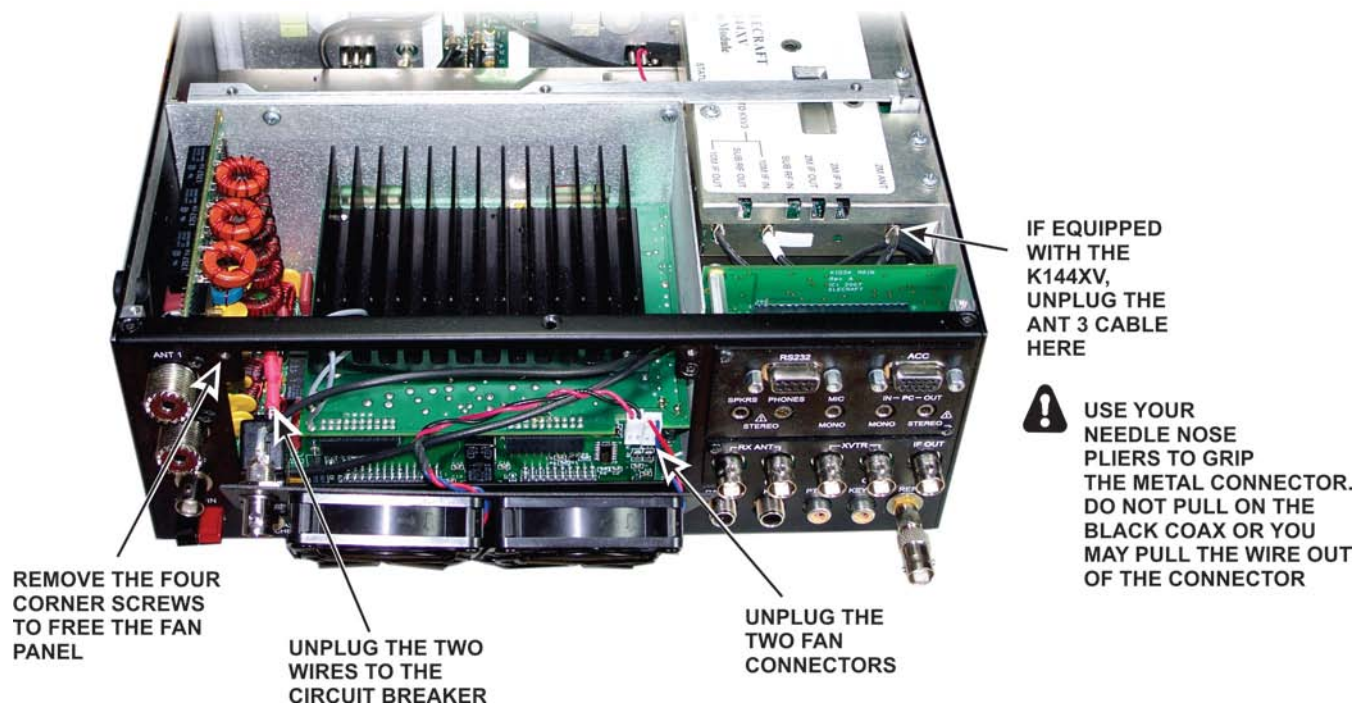
**Figure 2. Diode D34.**

☐ Leave the bottom cover off for now, turn the K3 over and remove the nine screws to free the top cover as shown in Figure 3. After removing the screws, lift the cover gently to reach the speaker wire connector. Unplug the speaker then set the top cover aside in a safe place.



**Figure 3. Removing the Top Cover.**

☐ Remove the KPA3 fan panel and set it aside (see Figure 4). If you have a K3/10, there will be a blank panel in place of the fan panel that also removes with four screws. Remove the panel and skip the next two steps.

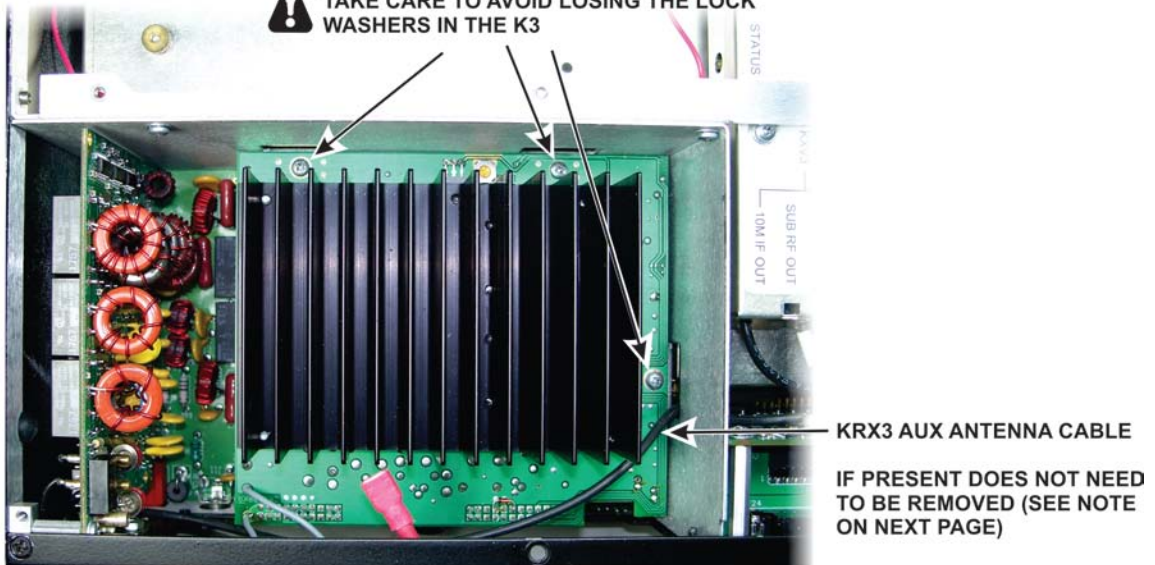


**Figure 4. Removing the Fan Panel.**

It may be possible to reach the remaining components to be replaced without removing the KPA3 module, but it is a lot easier and you are less likely to accidentally damage the KPA3 if you remove it. There are three screws holding it in place (see Figure 5). Remove them and their lock washers.

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

**! TAKE CARE TO AVOID LOSING THE LOCK  
WASHERS IN THE K3**



**Figure 5. Removing the KPA3 Screws.**

☐ 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 6). This will “walk” the connectors apart, freeing the module.

⚠ 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 be a coaxial cable running across the KPA3 module (see Figure 5). 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.

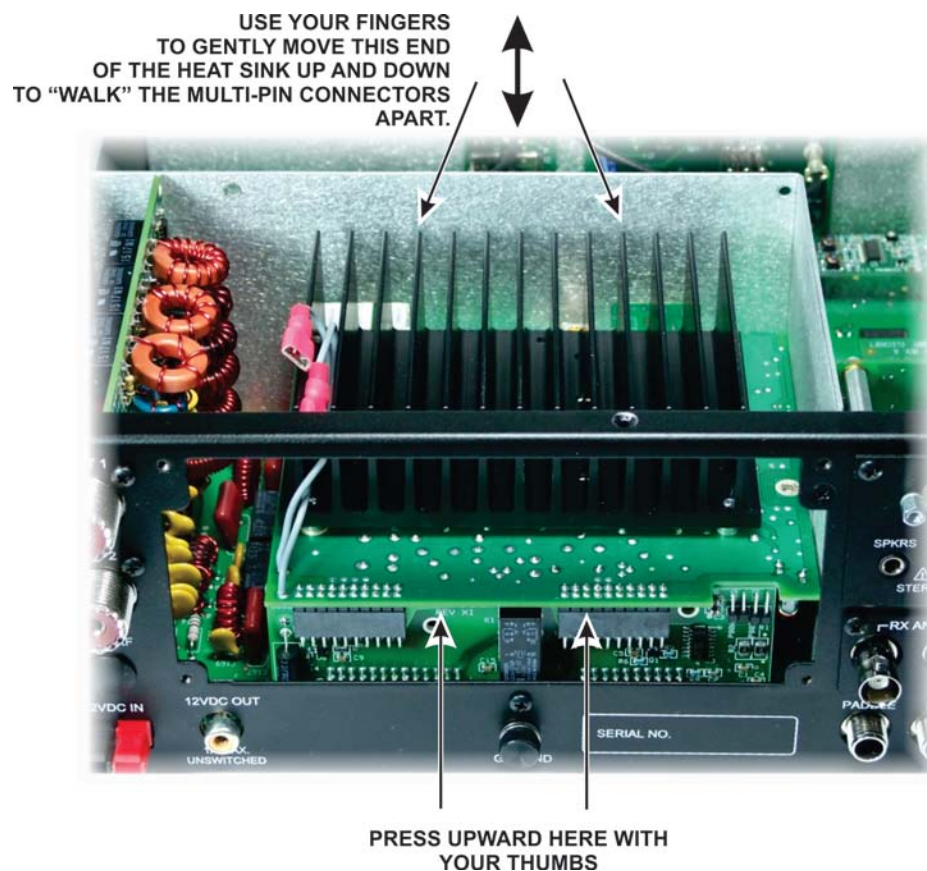
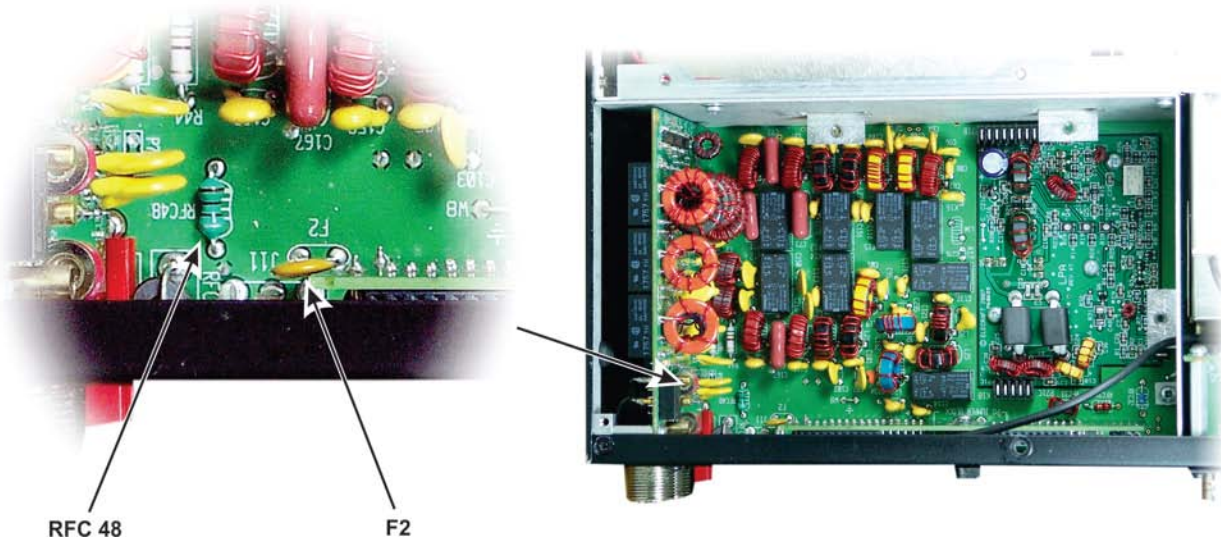


Figure 6. Removing the KPA3 Module.

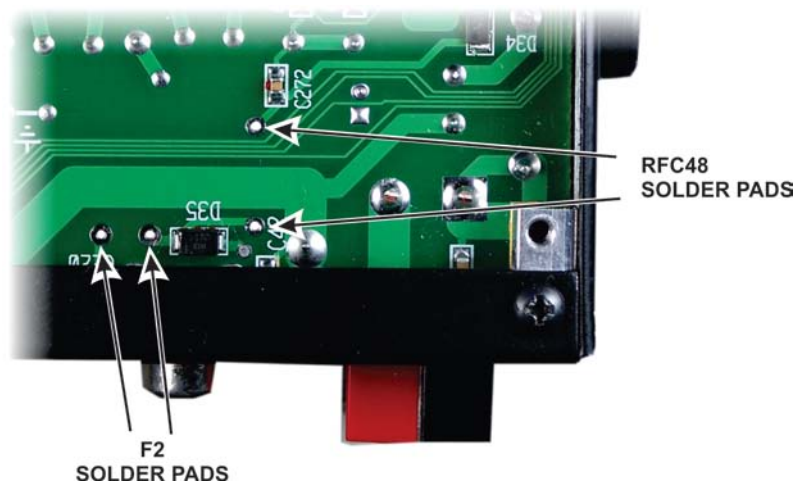
⚠ Your KPA3 module may produce a rattling sound when shaken. This is normal. It is caused by ferrite beads sliding along wire leads in the module.

☐ Locate resettable fuse F2 and choke RFC48 (see Figure 7). Remove both RFC48 and F2. Clear the holes of solder. The cleared solder pad locations on the bottom of the board are shown in Figure 8.

**⚠ Be sure the holes are completely clear of solder, especially the holes for F2. The replacement F2 has leads that fit very snugly in the pads, and any solder remaining will prevent inserting the leads.**

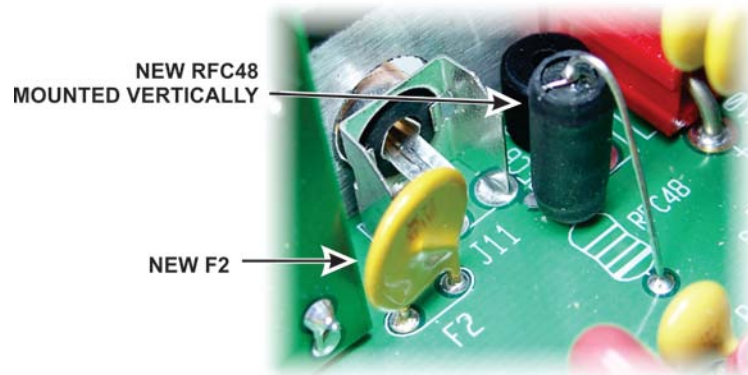


**Figure 7. RFC 48 and Resettable Fuse F2 Locations.**



**Figure 8. RFC48 and Fuse F2 Solder Pads on the Bottom of the Board.**

Install the new resettable fuse F2 and choke RFC48 in the holes and solder. Unlike the diode, they are not polarized. It does not matter which lead goes in which solder pad. However, the new RFC48 is larger than the hole spacing. Install it vertically as shown in Figure 9.



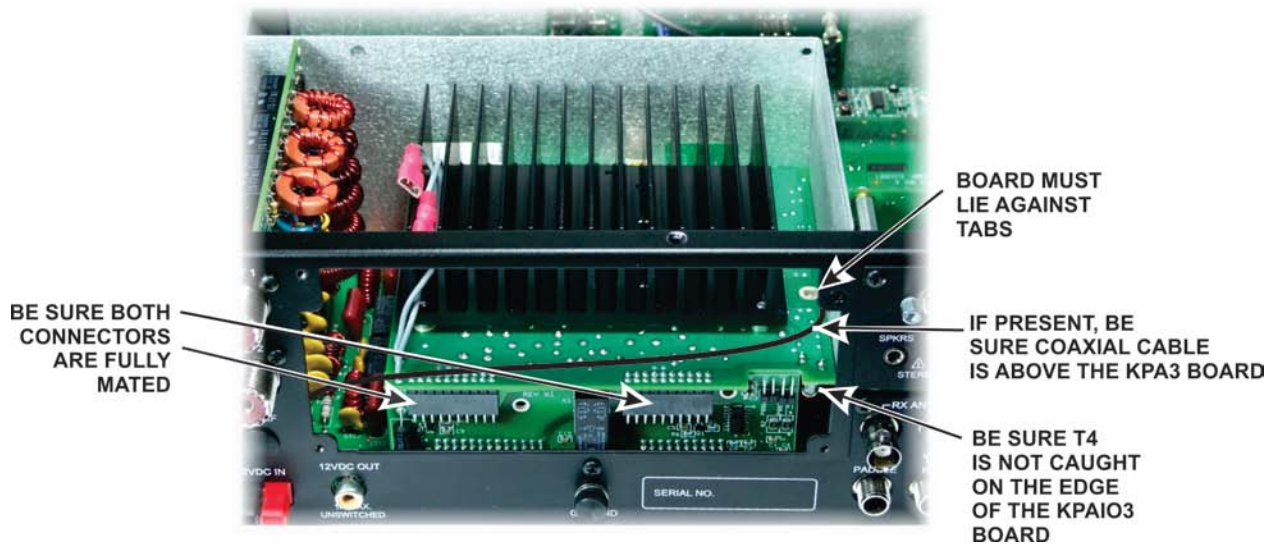
**Figure 9. New RFC48 and F2 Installed.**

Trim the leads to F2 and RFC48 flush with the bottom of the board.

Trim the leads flush with the bottom of the board and reinstall the bottom cover (Figure 1).

**⚠ CAUTION!** Be sure you replace the three longer screws with their lock washers in the locations shown in Figure 1. Failure to do so will lead to premature failure of the LPA power transistors.

Place the KPA3 module inside the shield from the top. Mate the two connectors fully with the KPAIO3 board as shown in Figure 10. If a coaxial cable is present running across the KPA3 enclosure, be sure it is routed above the KPA3 board as shown.



**Figure 10. 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 5).
- Replace the fan panel (see Figure 4).
  - 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 11). Ensure both fans turn freely.



**Figure 11. Positioning the Fan Leads.**



- Hold the top cover above the K3 and reconnect the speaker wire (see Figure 12), 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.

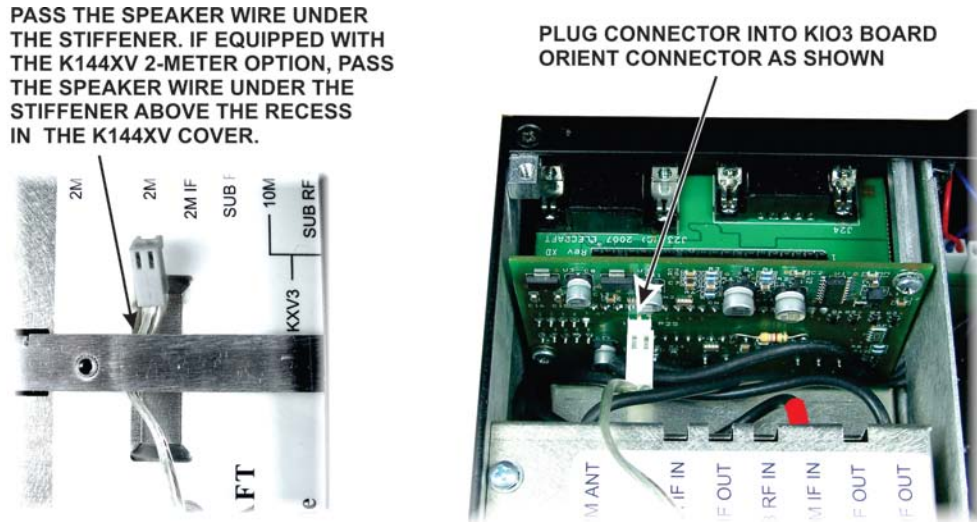


Figure 12. Reconnecting the Speaker Wire.

**⚠ 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.

- Peel the backing off of the self-adhesive label and place it over the original 0.5A legend below the 12VDC output connector in the K3 rear panel as shown in Figure 13..

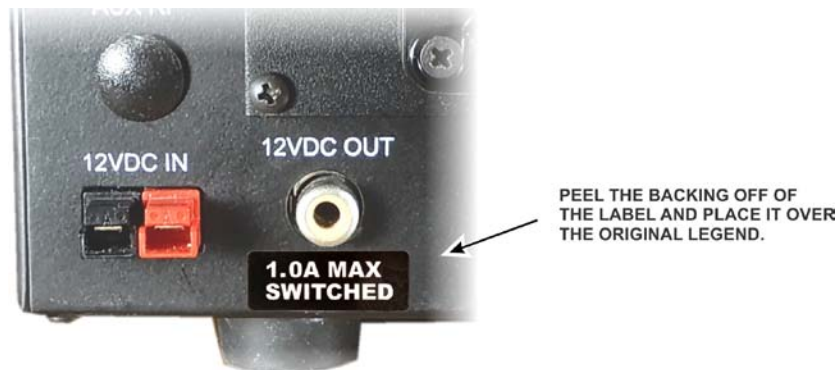


Figure 13. Installing the New Label.

That completes the modification.