ELECRAFT® K3

HIGH-PERFORMANCE 160 – 6 METER TRANSCEIVER

KXV3 INTERFACE OPTION
INSTALLATION INSTRUCTIONS

Rev B, October 30, 2007

Contents

Introduction

The KXV3 Interface provides a separate receive antenna input and output, inputs and outputs for use with an external transverter, and a buffered i.f. output. Complete details for using the KXV3 are included in the K3 Owner's manual. This manual covers the installation of the KXV3 Interface option in your K3 transceiver.

Only a few basic hand tools are needed (see page 5) to perform the installation. No soldering or wiring is required.

Customer Service and Support

Technical Assistance
You can send e-mail to support@elecraft.com and we will respond quickly - typically the same day Monday through Friday. Telephone assistance is available from 9 A.M. to 5 P.M. Pacific time (weekdays only) at 831-662-8345. Please use e-mail rather than calling when possible since this gives us a written record of the details of your problem and allows us to handle a larger number of requests each day.

Repair / Alignment Service *(We want to make sure everyone succeeds!)*
If necessary, you may return your Elecraft product to us for repair or alignment. (Note: We offer unlimited email and phone support to get your kit running, so please try that route first as we can usually help you find the problem quickly.)

IMPORTANT: You must contact Elecraft before mailing your product to obtain authorization for the return, what address to ship it to and current information on repair fees and turn around times. (Frequently we can determine the cause of your problem and save you the trouble of shipping it back to us.) Our repair location is different from our factory location in Aptos. We will give you the address to ship your kit to at the time of repair authorization. *Packages shipped to Aptos without authorization will incur an additional shipping charge for reshipment from Aptos to our repair depot.*

Preventing Electrostatic Discharge Damage

There is no climate or work location where the components of your K3 are safe from Electrostatic Discharge (ESD) unless you take specific steps to prevent such damage. Many of the components in your K3 can be damaged by static discharges of only a few volts: far too little for you to notice. It is those low-voltage but destructive discharges that easily happen anywhere and under virtually any environmental conditions.

ESD damage may not be apparent at first. The damaged components may not fail completely. Instead, the damage may result in below-normal performance for an extended period of time before you experience a total failure.

How ESD Damage Occurs

Whenever an object containing a static charge touches a circuit in your K3, current will rush into the circuit until the components reach the same voltage as the source of the static charge. If the voltage or current that passes through a component during that brief period exceeds its normal operating specifications, it may be damaged or destroyed.

Preventing ESD Damage

ESD damage cannot occur if there is no voltage difference between the components in your K3 and any object that touches them. That is how anti-static packaging works. Anti-static bags allow the static charge to flow over their surface, so that any part of the bag that touches the components inside are all at the same potential at all times. Anti-static foam keeps the leads of sensitive components at the same potential.

At your work bench, avoiding a dangerous voltage is achieved most easily by tying everything together and connecting them to a common mains safety ground. This includes your K3, individual boards or other sensitive components as well as everything they may touch at the work table.

Inexpensive static dissipating work mats are readily-available that will steadily and safely drain off any charges built up on parts or circuit boards placed on them. They are supplied with a lead that connects the mat to the common workbench ground. Also, metal cabinets on test equipment used on the bench should be tied together and connected to the common ground.

Most importantly, you must have a way of continuously draining off any static charges that occur on your body. Such charges are easy to create, even while sitting quietly at the work bench. Moving your feet on the floor, shifting position in your chair or even moving your arms so that clothing rubs against itself can produce destructive static charges. You can discharge yourself by touching an unpainted metal ground, but that will last only until you move in a way that produces a new static charge. The safest technique is to wear a grounded wrist strap with a series 1-megohm resistor that continuously drains off any charges. Such wrist straps are readily-available and inexpensive.

⚠ *WARNING*

> **DO NOT attach a ground directly to yourself without a current-limiting resistor as this poses a serious shock hazard. A wrist strap must include a 1-megohm resistor to limit the current flow. If you choose to touch an unpainted, metal ground to discharge yourself, do it only when you are not touching any live circuits with your other hand or any part of your body.**

We strongly recommend you take the following anti-static precautions (listed in order of importance) to avoid trouble:

- Leave ESD-sensitive parts in their anti-static packaging until you install them. The packaging may be a special plastic bag or the component's leads may be inserted in conductive foam. Parts which are especially ESD-sensitive are identified in the parts list and in the assembly procedures.

- Wear a conductive wrist strap with a series 1-megohm resistor. If you do not have a wrist strap, touch a ground briefly before touching any sensitive parts to discharge your body. Do this frequently while you are working. You can collect a destructive static charge on your body just sitting at the work bench. **DO NOT attach a ground directly to yourself as this poses a serious shock hazard.**

- Use a grounded anti-static mat on your work bench.

- If you choose to use a soldering iron to work on your K3 for any reason, be sure your iron has an ESD-safe grounded tip tied to the same common ground used by your mat or wrist strap.

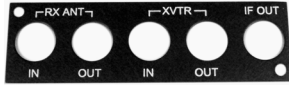# Preparing for Installation

Tools Required

1. #0 and #1 size Phillips screwdrivers. To avoid damaging screws and nuts, a power screwdriver is *not* recommended. Use the screwdriver that best fits the screw in each step.
2. Wrench to remove jack screw nuts on the K3 back panel. 3/16" nut driver recommended.
3. Small diagonal cutters.
4. Small needle-nose pliers or tweezers to position small parts.
5. Soft cloth or clean, soft static dissipating pad to lay cabinet panels on to avoid scratching.

The following tools are strongly recommended:

1. ESD wrist strap.
2. Static dissipating work pad.

Parts Included

The following parts should be included in your kit. Check to ensure you have them all. If any parts are damaged or missing, contact Elecraft for replacements (see *Customer Service and Support*, page 3).

ILLUSTRATION	DESCRIPTION	QTY.	ELECRAFT PART NO.
	XV3 Printed Circuit Board Assembly **⚠ ESD Sensitive.**	1	E850244
	XV3 Connector Panel	1	E100224SS
	KXV3 TMP Cable Assembly	1	E850292
	Screw, 4-40, 1/2" (13 mm)	2	E700030
	Lockwasher, 4-40, inside tooth	2	E700010
	Nut, 4-40	2	E700011

Installation Procedure

⚠ **SPECIAL NOTE FOR K3 KIT BUILDERS:** **If you were directed here by the K3 Kit Assembly Manual to install your KXV3 Module, inventory the parts in this kit then begin installation at the step indicated on page 9.**

☐ 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 then set the top cover aside in a safe place.

(1) **REMOVE 9 SCREWS HOLDING TOP COVER.**   (2) **TO OPEN COVER, PRESS HERE TO TILT FRONT EDGE UP OR PLACE UNIT ON ITS SIDE FEET, THEN TIP FARTHER SO THE TOP COVER SWINGS OPEN.**
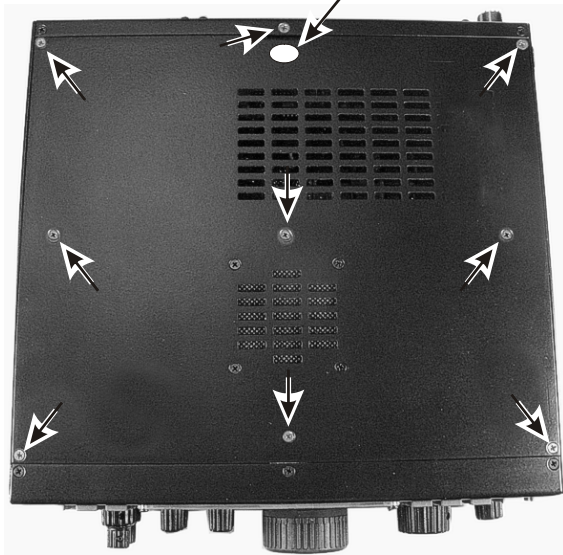

Figure 1. Removing K3 Top Cover.

⚠ **CAUTION:** **Touch an unpainted metal ground or wear a grounded wrist strap before touching components or circuit boards inside the K3. See** *Preventing ESD Damage* **on page 4 for more information.**

☐ Remove the four jack screw nuts with their lock washers and the two black pan head screws from the KIO3 rear panel as shown in Figure 2.
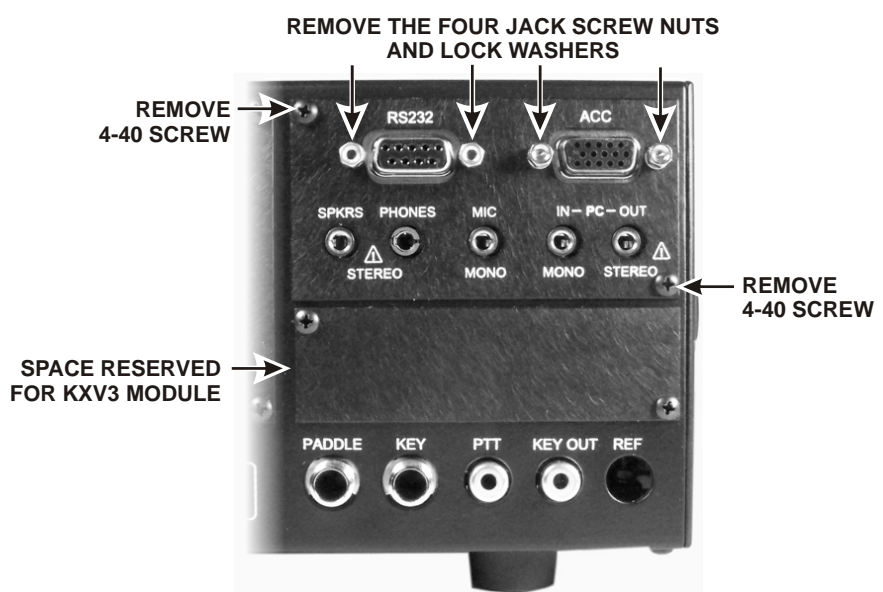

Figure 2. Removing KIO3 Panel.

☐ With the back cover of the KIO3 removed, remove the upper Remote I/O daughter board holding the RS232 and ACC connectors as shown in Figure 3. Only the upper daughter board need to be removed. The lower Audio I/O interface board may be left in place.

⚠ *CAUTION:* **The Remote I/O daughter board is ESD sensitive. Put it in a safe place until you reinstall it.**
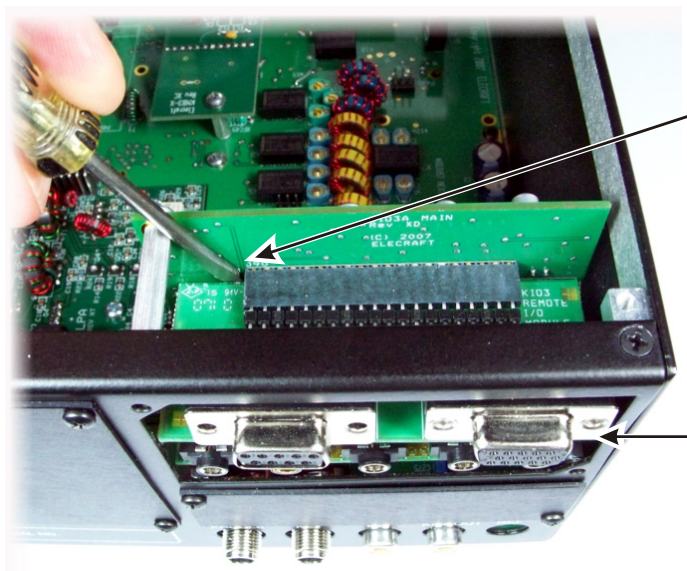
Figure 3. Removing the KIO3 Remote I/O Daughter Board.

☐ Tilt the top of the KIO3 Main board toward the front panel gently so the standoff at the top clears the lip on the rear panel, then use the standoff at the top to lift up on the board while rocking it from side to side to unplug the connector.

⚠ *CAUTION:* **The KIO3 Main board is ESD sensitive. Put it in a safe place until you reinstall it.**

☐ Remove the blank panel covering the space for the KXV3 module (see Figure 2). This panel will not be replaced.

☐ Turn the K3 upside down and remove the bottom covers (see Figure 4).
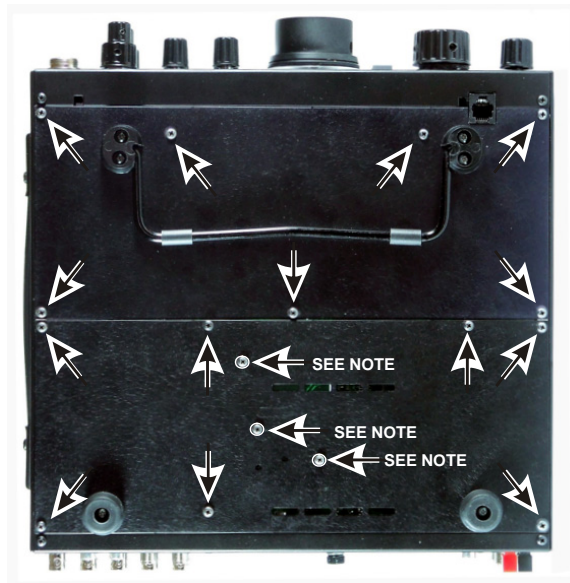
REMOVE ALL THE
SCREWS INDICATED
AND LIFT THE
BOTTOM COVERS
OFF.

NOTE:
THESE THREE SCREWS
ARE 1/4" (6.4 mm) LONG
AND HAVE INSIDE TOOTH
LOCK WASHERS UNDER
THE SCREW HEADS.
ALL THE OTHER SCREWS
ARE 3/16" (4.8 mm) LONG
AND HAVE NO LOCK
WASHERS.

Figure 4. Removing the Bottom Covers.

⚠ **SPECIAL NOTE TO KIT BUILDERS:** **If you were directed here to install your KXV3 module as part of the overall kit assembly, begin with the following step.**

☐ Cut jumpers W1 and W2 on the RF board (the large board filling the bottom of the chassis). These jumpers are located under where you just removed the KIO3 boards (see Figure 5). *Take care to identify the correct jumpers. Do not cut nearby jumpers W20 or W21!* It is not necessary or desirable to unsolder the jumpers. Simply cut them with your diagonal cutters, taking care not to lose the bits of the jumper wire inside the K3, but be sure to cut the ends short. No more than 1/8" (3 mm) of jumper should be left at each solder pad to avoid the possibility of its shorting to a nearby circuit.

KEY AND PADDLE JACKS

REAR PANEL

⚠

ESD SENSITIVE!
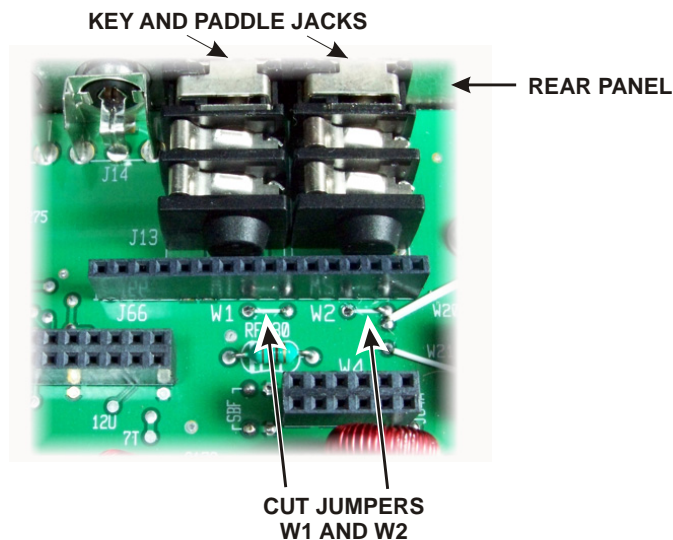
**CUT JUMPERS
W1 AND W2**

Figure 5. Locating Jumpers W1 and W2.

☐ Inspect the white connector at the end of the TMP cable. The side nearest the connector holes must be smooth and flat. Use your diagonal cutters or a hobby knife to cut away any bumps or ridges (see Figure 6).

TRIM AWAY ANY RIDGES OR BUMPS TO PROVIDE A FLAT, SMOOTH SURFACE

Figure 6. Preparing TMP Cable for Installation.

⚠ *CAUTION:* **The KXV3 board is ESD sensitive. Wear a grounded wrist strap or touch an unpainted metal ground before handling it.**

☐ Remove the KXV3 board assembly from its packaging. If the black panel is mounted on the assembly, remove it. Set the screws and washers aside to be installed later.

☐ Fit the TMP coaxial connector onto J87 on the KXV3 board assembly (see Figure 7).

☐ Thread the square connector on the TMP cable through the gap between Q3 and the side of the RF board, then plug the KXV3 board assembly into J66 on the RF board with the four BNC connectors facing out through the rear panel (see Figure 7). The pins will just clear the top of J66 when the BNC connectors are up against the top of the opening in the rear panel.

PLUG COAXIAL CONNECTOR INTO J87

CABLE PASSES BETWEEN EDGE OF BOARD AND KIO3 BOARD

ROUTE CABLE TO UNDERSIDE OF RF BOARD
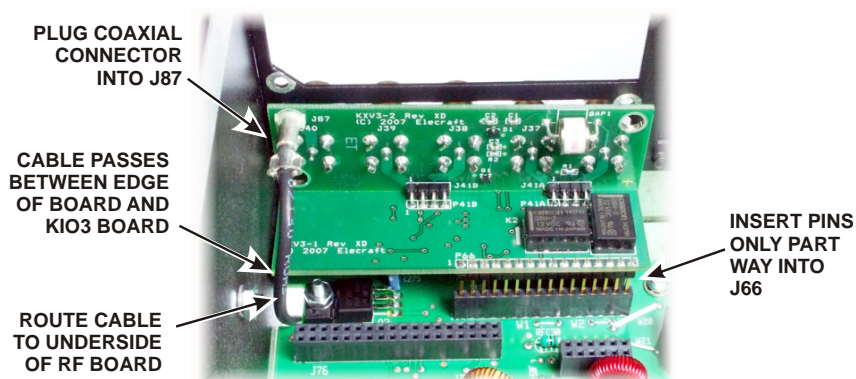
INSERT PINS ONLY PART WAY INTO J66

Figure 7. Mounting KXV3 Board.

☐ Push the connector pins into J66 only as far as needed so the holes in the KXV3 connector bushings are aligned with the holes in the back panel as shown. These connectors do not fully mate and the bushings hold the board away from the rear panel. .

⚠ **As you install components and reassemble your K3, be sure all the screws are in place and secure, but do not over tighten them. Failure to tighten all screws may result in poor shielding of sensitive components, resulting in possible noise or birdies in the receiver as well as other difficult-to-trace problems.**

☐ Mount the KXV3 rear panel over the BNC connectors using two 4-40 1/2" (13mm) black pan head screws through the corner holes with #4 inside tooth lock washers and 4-32 nuts on the inside as shown in Figure 8. Do not fully tighten the nuts yet.
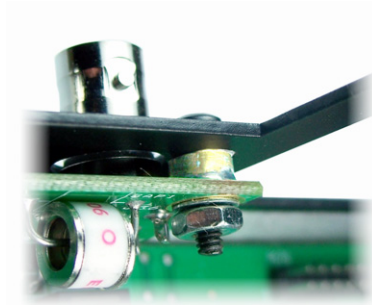

Figure 8. Mounting Hardware.

☐ Adjust the depth the KXV3 board connector mates J66 on the RF board so the KXV3 connector panel is parallel with the back panel. The pins on the KXV3 board connector do not go all the way into J66 as shown in Figure 9.
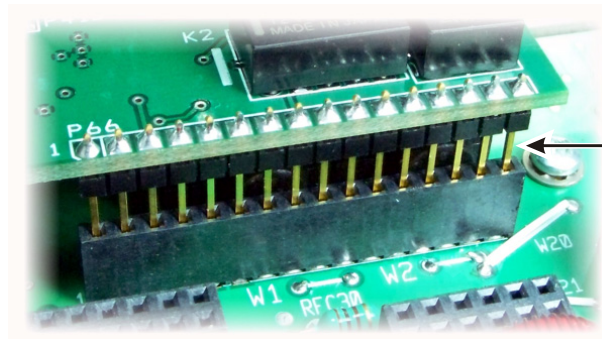
⚠

ESD SENSITIVE!

TYPICAL CONNECTOR POSITION WHEN INSTALLATION COMPLETE

Figure 9. Typical Connector Fit.

☐ Tighten the screws and nuts holding the KXV3 to the back panel that you installed earlier (See Figure 8) .

☐ Route the coaxial cable from the KXV3 board to connector P86 on the bottom of the RF board as shown in Figure 10. Mate the connector to P86 as shown. If the connector does not appear to fit, check to make sure there are no plastic ridges on the side toward the RF board (see Figure 6).
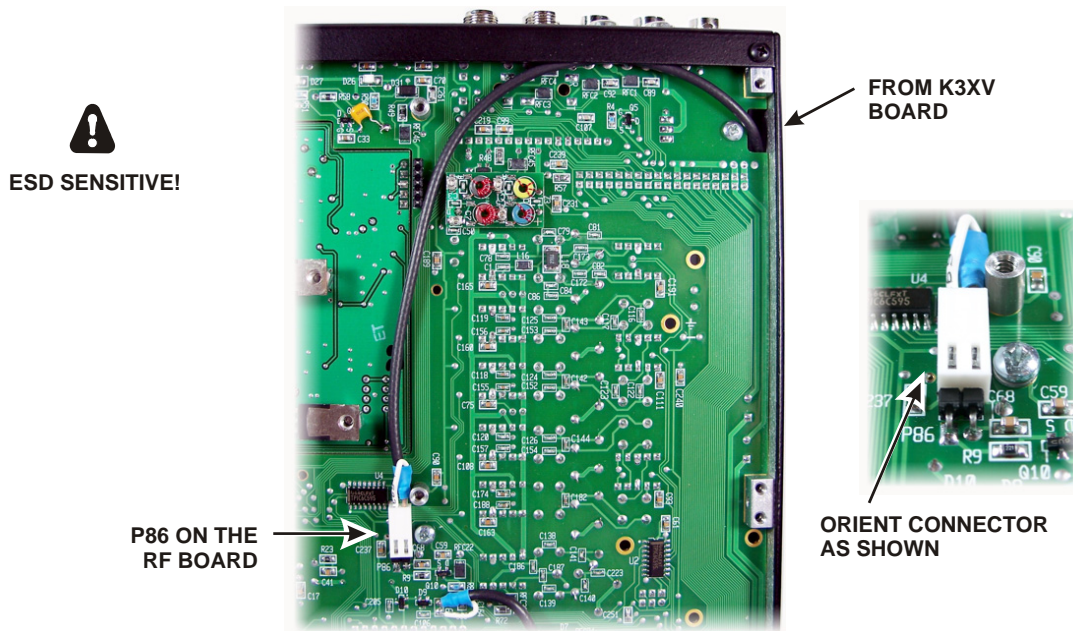

Figure 10. Routing KXV3 Cable to P86.

⚠ **SPECIAL NOTE TO KIT BUILDERS:** **If you were directed here to install your KXV3 module as part of the overall kit assembly, installation of the KXV3 module is complete. Return to the K3 Kit Assembly Manual where you left off.**

☐ Replace both bottom covers using the 4-40 black pan head screws you removed earlier. Note that three locations take the 4-40 1/4" (6.4 mm) black pan head screws with lock washers as shown in Figure 4, while the remainder are 4-40 3/16" (4.8 mm) screws . Be sure to replace these screws in the correct locations. Make sure all the screws are secure, but do not over tighten them/

CAUTION!

Failure to replace the three 1/4" (6.4 mm) screws with their lock washers in the locations shown in Figure 4 may destroy power transistors in your K3!

☐ Check the KIO3 board and ensure the screws holding the two standoffs are tight. Also check to ensure the connector on the Audio I/O daughter board is fully mated with J91 on the KIO3 Main board (see Figure 11).
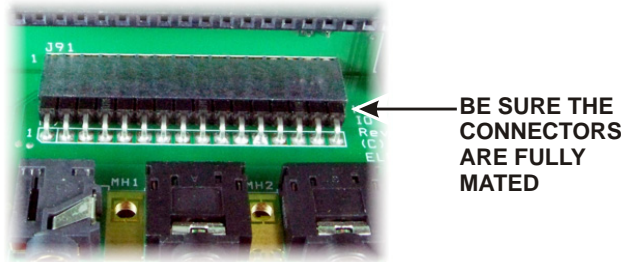

BE SURE THE
CONNECTORS
ARE FULLY
MATED

Figure 11. Check KIO3 Audio I/O Board Mating.

☐ Replace the KIO3 Main Board with the Audio I/O daughter board attached in the K3 as shown in Figure 12. The Audio I/O board fits just over the KXV3 board assembly and the TMP cable passes through the space between the edge of the KXV3 board and the KIO3 board. Ensure the KIO3 connectors are fully mated so the standoffs line up with the holes in the rear panel.

TILT BOARD JUST
ENOUGH FOR THE
STANDOFF TO CLEAR
THE LIP ON THE REAR
PANEL

BE SURE CONNECTORS
ARE ALIGNED WITH
ALL PINS ENGAGED
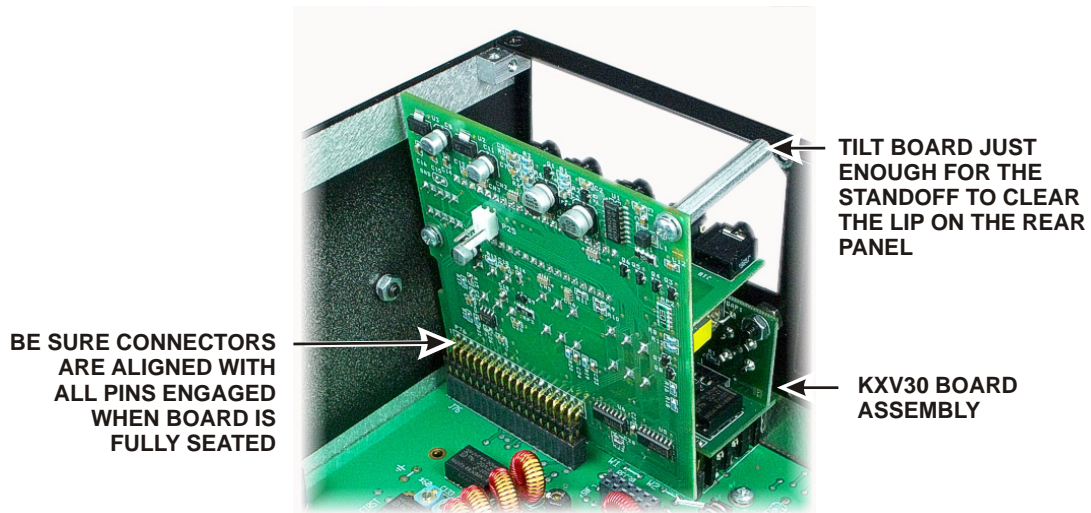WHEN BOARD IS
FULLY SEATED

KXV30 BOARD
ASSEMBLY

Figure 12. Installing KIO3 Main Board.

☐ Install the KIO3 Digital I/O daughter board as shown in Figure 13. Be careful to support the KIO3 main board as shown while pressing the daughter board in place.
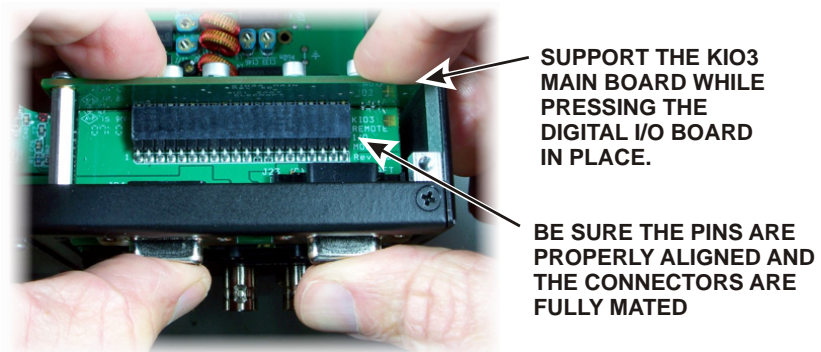

ESD SENSITIVE!

SUPPORT THE KIO3
MAIN BOARD WHILE
PRESSING THE
DIGITAL I/O BOARD
IN PLACE.

BE SURE THE PINS ARE
PROPERLY ALIGNED AND
THE CONNECTORS ARE
FULLY MATED

Figure 13. Installing the KIO3 Digital I/O Board.

☐ Install the KIO3 rear panel as shown in Figure 14.

4-40 3/8" (9.5 mm) BLACK PAN HEAD SCREW (NO WASHER) IN EACH CORNER

BE SURE AUDIO JACKS ARE ALIGNED WITH PANEL CUTOUTS

KXV3 INTERFACE OPTION (IF INSTALLED)

USE A 4-40 SPLIT LOCK WASHER UNDER EACH JACK SCREW NUT (4 PLACES)
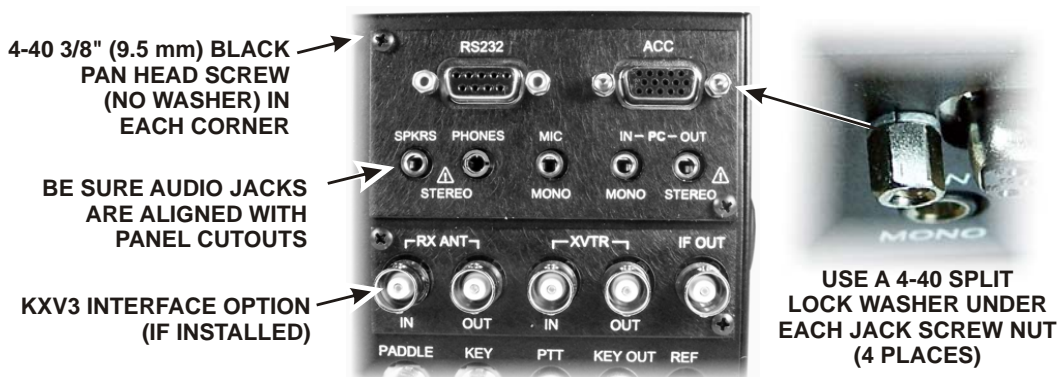
Figure 14. Mounting the KIO3 Rear Panel.

☐ Hold the top cover above the K3 and plug the speaker wire into P25 on the KIO3 board at the left rear of the K3 as shown in Figure 15.

KIO3 BOARD IN BACK LEFT CORNER OF CHASSIS

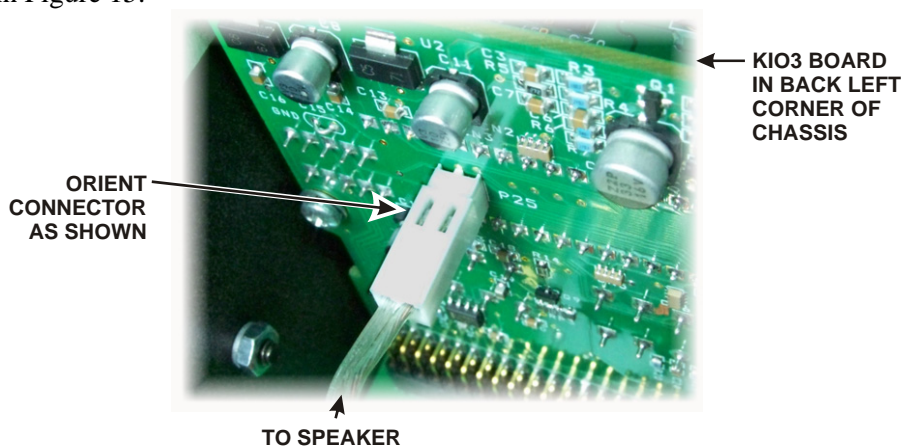**ORIENT CONNECTOR AS SHOWN**

TO SPEAKER

Figure 15. Connecting Speaker Cable.

☐ Position the top cover on the K3. Note that the tab on the back center goes under the rear lip of the K3 rear panel. Secure the top cover with the nine 4-40 3/16" (4.8 mm) black flat head screws you removed earlier.

⚠ REPLACE ALL THE SCREWS!

The K3's chassis has excellent rigidity despite its light weight. The screws that hold the top cover 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

☐ Reconnect power and antenna (or dummy load) to your K3 and turn it on. Enable your KXV3 interface using the `CONFIG` menu as described in the Owner's Manual.

This completes the installation of the KXV3 interface in your K3 transceiver.