

Elecraft KX3 VFO Tuning Noise Suppression Modification

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Introduction

This is an *optional* modification. Many KX3s will not need it.

You should only consider making the mod if all of the following are true:

- your KX3 has a KXFL3 filter module installed
- the KXFL3 was not already modified (see **Identifying Factory-Modified KXFL3 Modules** below)
- you can hear objectionable levels of “zipper” noise when the VFO is tuned across some bands *even with an antenna connected* (there is no way to completely eliminate audible artifacts without an antenna)
- **Firmware-Based Noise Reduction Techniques** (see below) do not provide optimal results

NOTE: Even if you do make the modification, there is no guarantee that tuning noise will be reduced on all bands. The mod often provides a significant benefit in cases where the tuning noise was quite strong, typically on the highest bands.

Identifying Factory-Modified KXFL3 Modules

Factory assembled KX3s from serial number 4668 up, and kits from serial number 4753 up, have been shipped with an updated KXFL3 filter module if this option was ordered.

You can also inspect the module itself. (See next page for instructions on locating the module.) If pins 11 and 12 of the 12-pin connector have been removed from the board, the KXFL3 has been modified. Even though the modification discussed in this document removes a third pin as well, the factory's mod achieves the same results by removing a component from the PC board.

Firmware-Based Noise-Reduction Techniques

To minimize the noise on a given band, you should try the following, in this order:

- set the VFO NR menu entry to ON
- set the RX SHFT menu entry to 8.0
- turn on the KX3's regular noise blanker, setting it to a low level (requires KX3 firmware rev 1.48 or later)

All of the above settings are per-band, so they need only be used on affected bands.

Optional KXFL3 Modification

The hardware modification described here is an alternative for those who have the KXFL3 module. In most cases the mod will reduce the noise on some bands, especially on 6 meters where it is the most noticeable. It is not guaranteed to reduce or eliminate noise, so you may still want to use the firmware techniques described above on some bands.

The modification removes three pins from the KXFL3 connector that plugs into the KX3 RF board. No soldering is required. You will need a No.1 Phillips screwdriver, small diagonal cutters and small long-nose pliers.

Procedure

⚠ A grounded wrist strap and ESD dissipating mat are recommended whenever you work inside your KX3. Optionally, touch a bare metal ground frequently while working.

Disconnect any leads, including external power if used, and open the KX3 as if you are replacing the batteries. This procedure is described in the KX3 Owner's Manual under Internal Batteries.

Locate the KXFL3 board located between the battery holder nearest the end of the KX3 and the heat sink. Loosen the retaining screw and remove the KXFL3 board as shown in Figure 1.

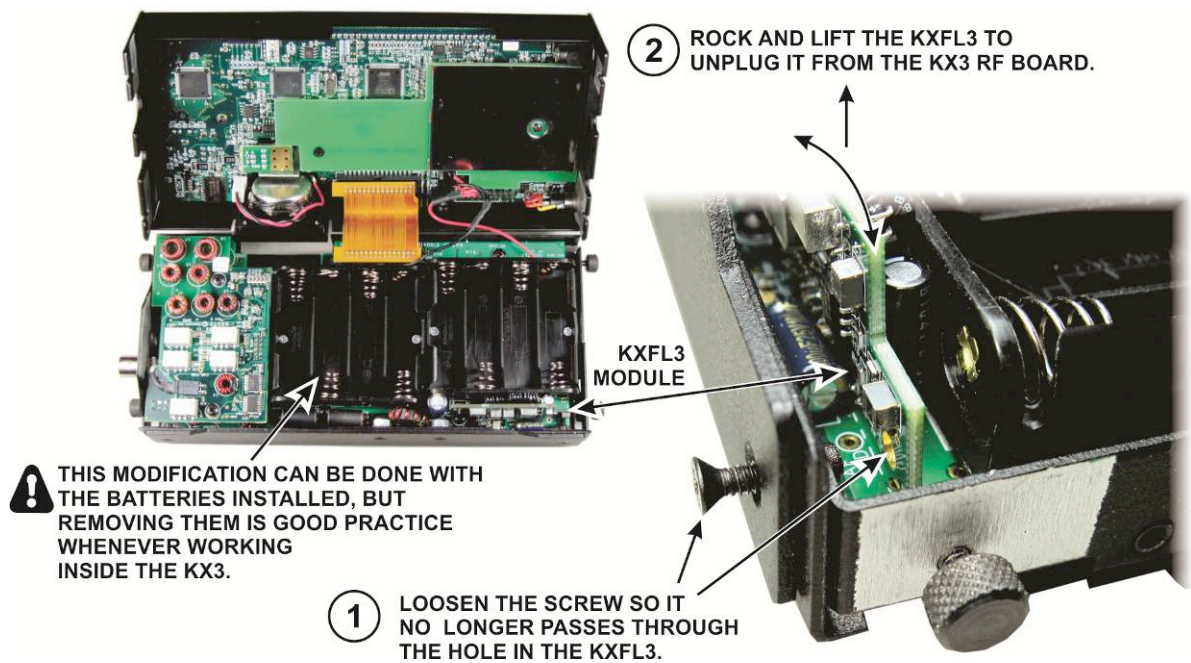
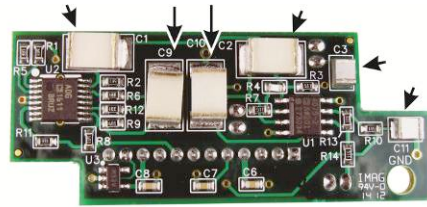


Figure 1. Removing the KXFL3 Module.

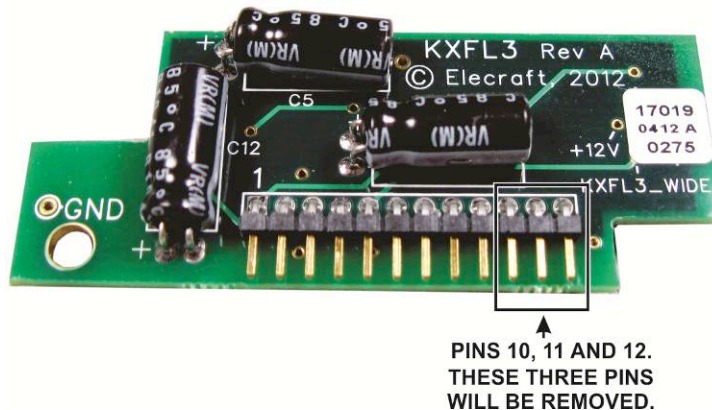
⚠ Handle the KXFL3 board carefully. Do not press on the square capacitors C1, C2, C3, C9, C10 or C11 shown in Figure 2. If you do, you may alter their capacitance enough that you will need to repeat the entire calibration procedure found in the KXFL3 manual. (If needed, the KXFL3 manual can be downloaded from www.elecraft.com.)



⚠ DO NOT PRESS AGAINST THESE CAPACITORS WHILE WORKING.

Figure 2. Sensitive Capacitors.

On the front of the KXFL3 module, locate pins 10, 11 and 12 (see Figure 3).



**PINS 10, 11 AND 12.
THESE THREE PINS
WILL BE REMOVED.**

Figure 3. Connector Pins to be Removed.

Cut through the plastic to separate Pins 10, 11 and 12 from the others. Cut as close to pin 10 as possible to avoid removing the plastic from pin 9 next to it (see Figure 4). Handle the board gently. Do not press down against the sensitive capacitors (Figure 2).

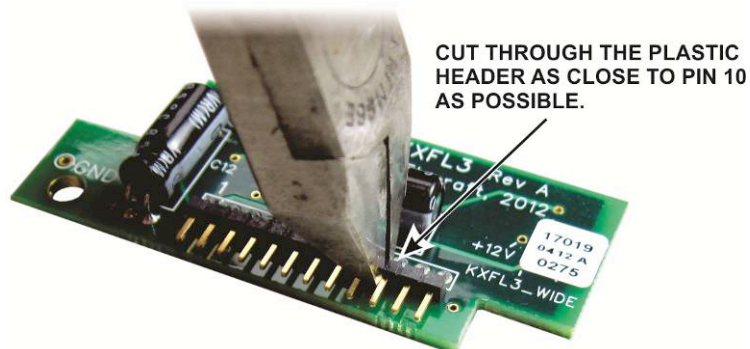


Figure 4. Cutting the Plastic Header.

- Once the plastic header is cut through, use your needle nose pliers to bend the pins 10, 11 and 12 up away from the board as shown in Figure 5.

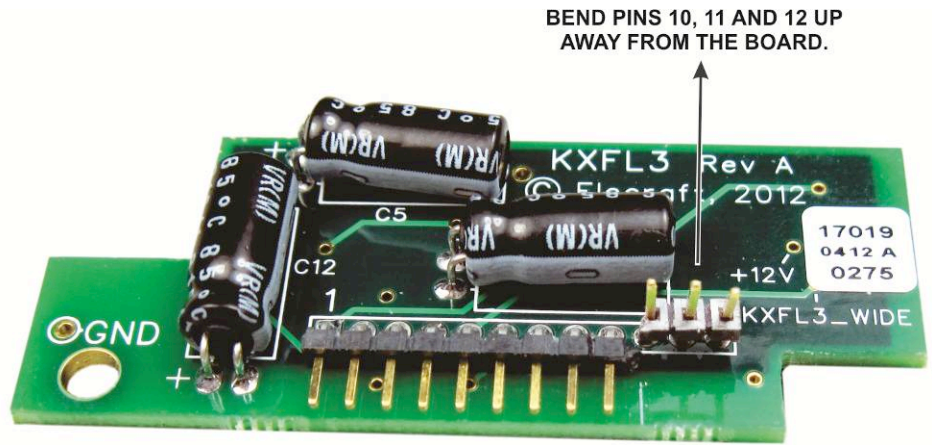


Figure 5. Preparing to Cut Pins 10, 11 and 12.

- Cut pins 10, 11 and 12 off close to the pc board as shown in Figure 6.

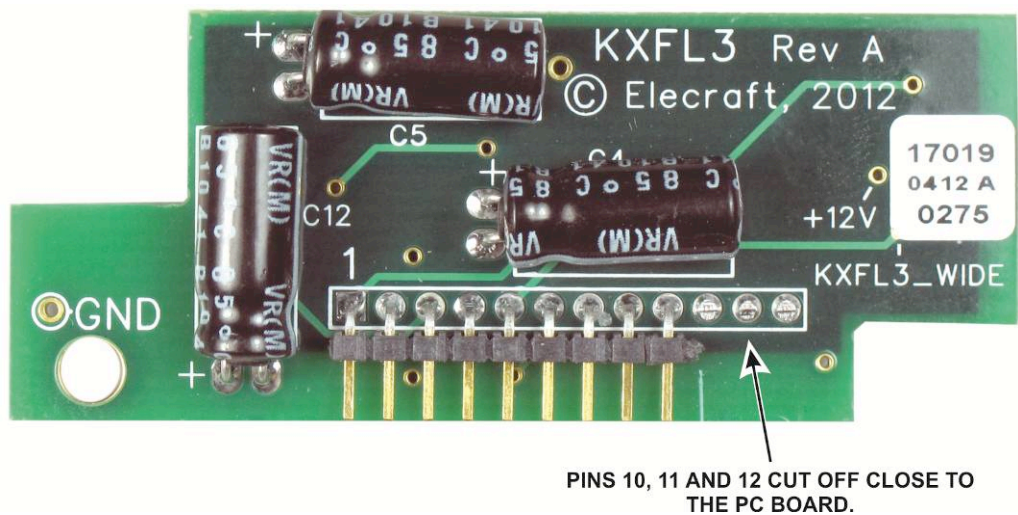


Figure 6. Pins 10, 11 and 12 Cut.

- Replace the KXFL3 module in the KX3 and tighten the screw that retains the board as shown in Figure 7. The screw is there only to ensure the KXFL3 module cannot be dislodged by rough handling of the KX3. It does not provide a ground return or other function.

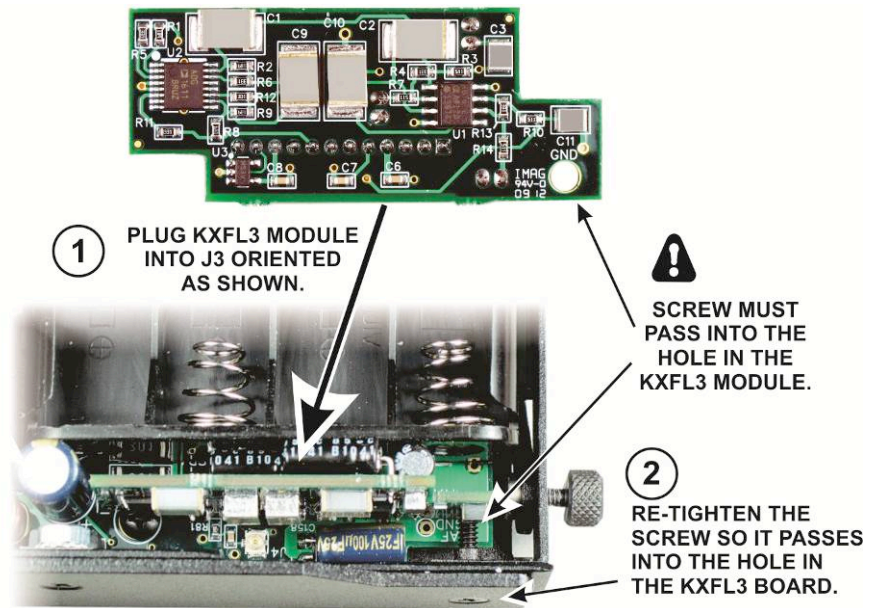


Figure 7. Replacing the KXFL3 module in the KX3.

- Replace the KX3 internal batteries (if used) and reassemble the KX3.

This completes the modification.