

## TS-2000: Installing the Inrad #92 Filter

The TS-2000 is an excellent radio. Its performance can be significantly improved on CW and SSB by replacing the Kenwood XF-6 filter with International Radio's 2.1 kHz 8 pole filter #92. (NOTE: These instructions also apply to the #90 1000 Hz filter for those interested in a CW only radio.)

Listening tests after the installation show a large reduction in off-channel CW signals. The 2.1 kHz bandwidth gives fuller use of the DSP. For those who say this radio suffers from blow-by, this is a rewarding modification and well worth the effort. The TS-2000 radio has lots of small and delicate components, so exercising care is important.

### Installation Instructions

Carefully read the instructions all the way through before beginning this modification.

**Warning:** *Modern radios contain components which may be damaged by static discharge. Precautions must be taken to eliminate any static electricity buildup between the operator and the radio before any of the internal circuits are touched. If you are not familiar with the proper techniques for this, consult the Radio Amateurs Handbook.*

1. Disconnect the DC line cord from the transceiver.
2. Remove the bottom cover.
3. Remove the seventeen screws that hold down the TX-RX1 Unit circuit board.
4. Remove the heat sink clip from IC9 (there is no insulating washer here).
5. Note the location of the Kenwood XF-6 filter on the component side of the PCB assembly. It is chrome plated and clearly labeled.
6. Unplug the RF cable from CN49 (near XF-6).
7. Carefully turn the TX-RX1 board assembly over.
8. Using a small, grounded tip soldering iron and solder braid, carefully clean the solder from the four pins and the two mounting lugs of XF-6 - and gently remove it.
9. Cut the supplied RG-174 coax into two 12" long pieces.

10. Prepare the ends of the coax according to Figure 1, and solder one side of each cable to the appropriate pins on the filter (Figure 2).
11. Bring the remaining side of each cable to the area where XF-6 used to be. Insert the center conductor and ground lead of each cable into the appropriate through-hole locations on the top side of the PCB. Carefully solder these wires on the back side of the assembly. Figure 3 shows the cables mounted in place.
12. Carefully bring the route the filter between the cables to the empty area near the fan. Using the double-stick foam tape, mount the back of the filter to the main chassis. Figure 4 shows the completed installation.
13. Reinstall all screws on PCB, plug RF cable back into CN49 and reinstall bottom cover.

Sweep of the original filter and International Radio's #92 filter superimposed:

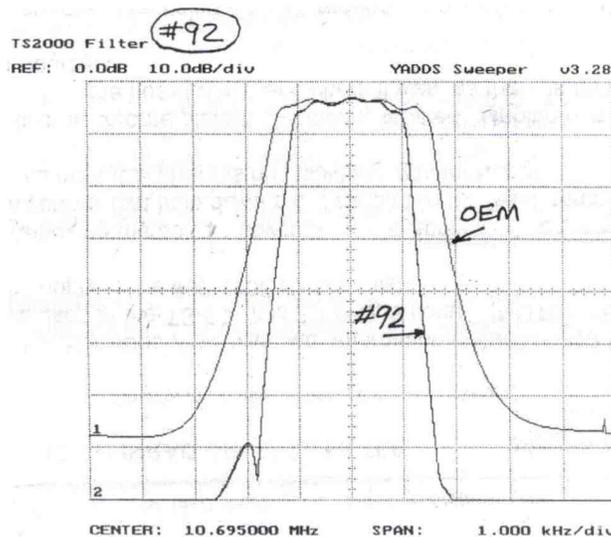
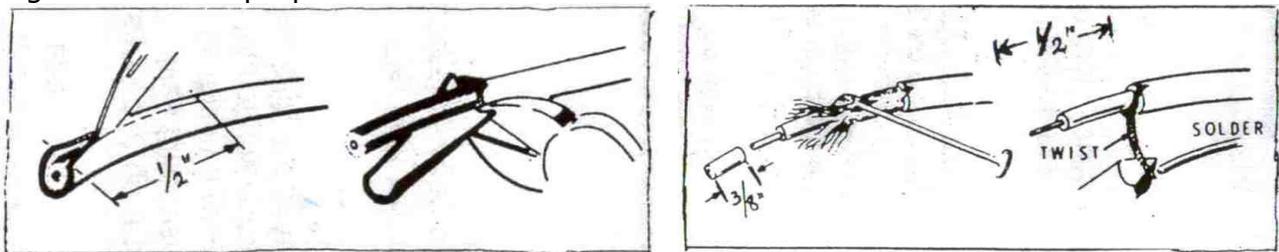


Figure 1. Cable preparation.



Prepare the coax as shown. Cut the lengths to fit your installation if necessary. Using a very sharp knife, cut through the outer insulation and remove about 1/2", but take care not to cut through the outer shield of very thin wires. Comb out these shield wires and twist them tightly together. Remove 3/8" of inner insulation. Apply a small amount of solder to the end of the shield wires and the inner lead. Use only enough heat for the solder to flow.

Figure 2. Cable connections to filter.



Figure 3. Cable connections to TX-RX1 PCB.

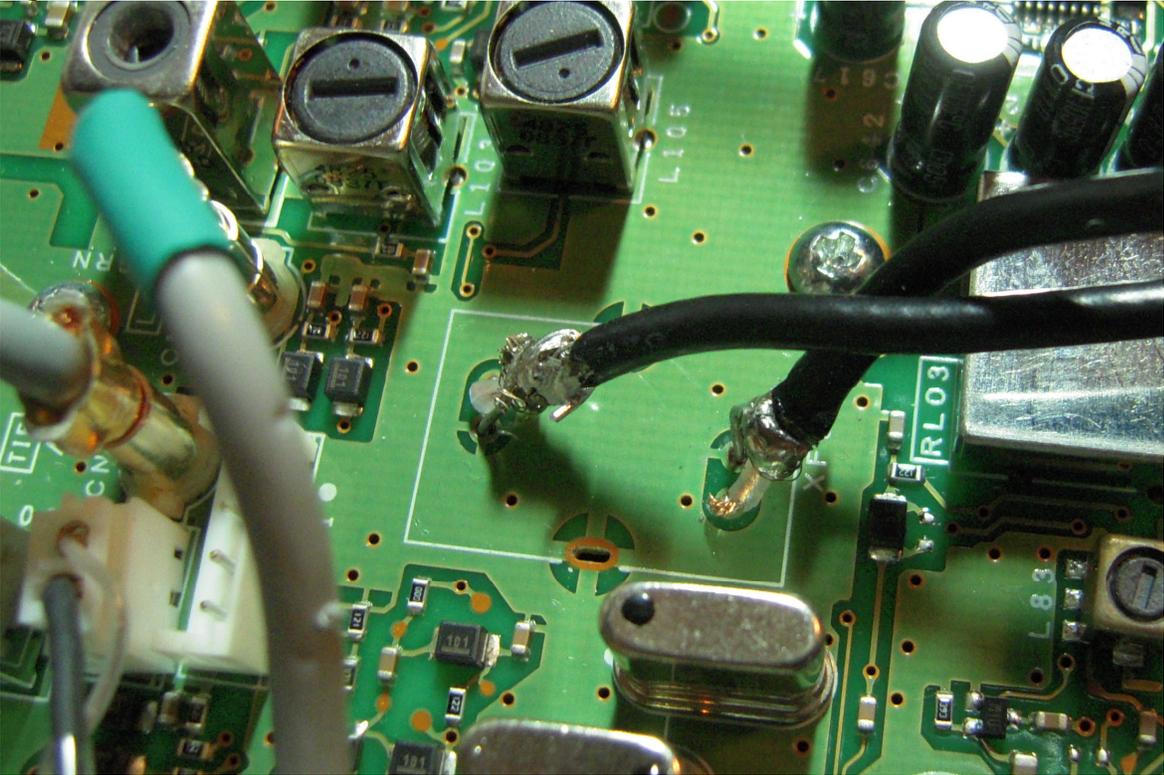
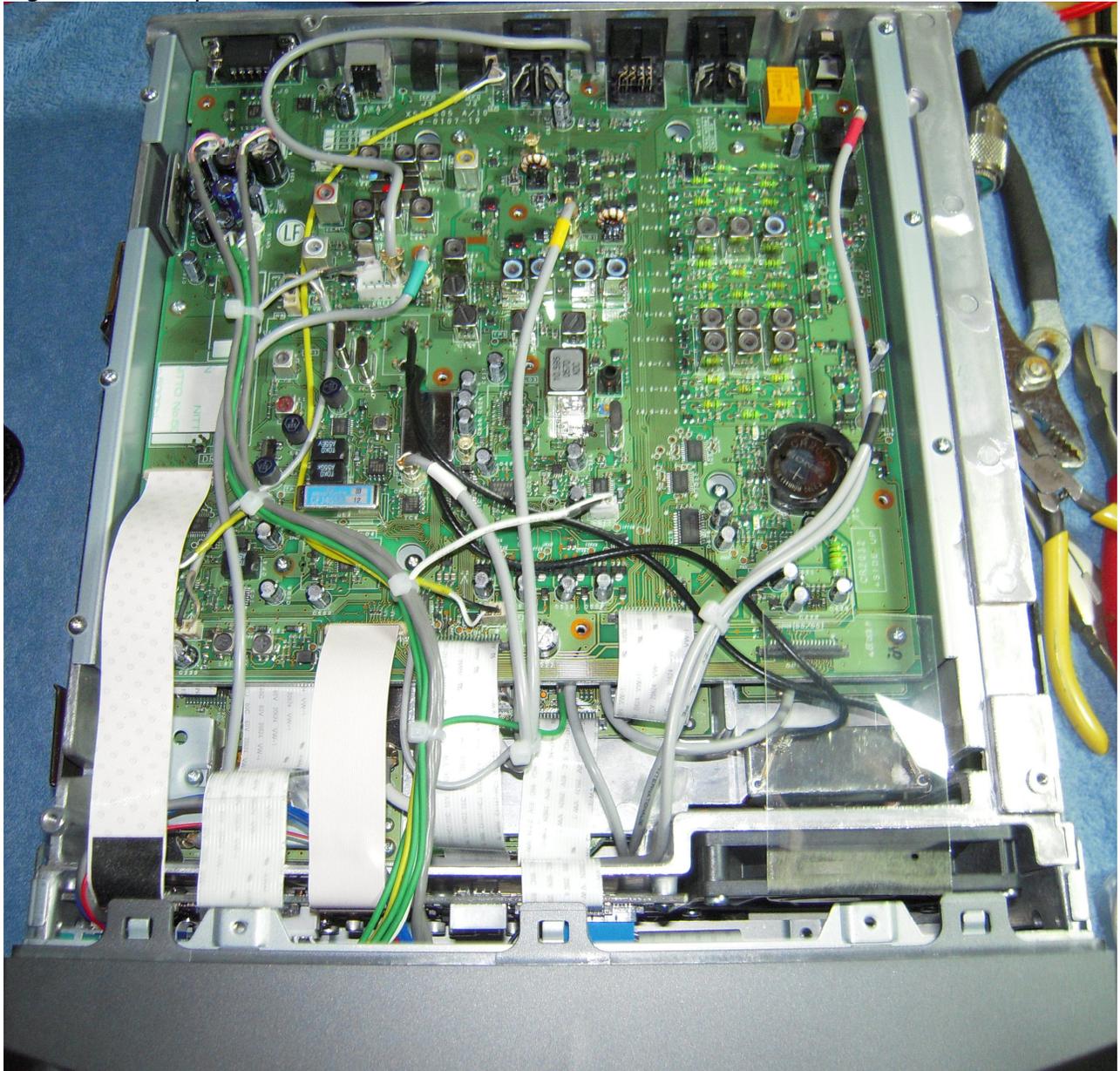


Figure 4. Completed filter installation.



#### Parts List

- Inrad #92 filter
- 24" RG-174 miniature coax
- 3" double-stick foam tape