

Hi All:

This is a modification to incorporate an INRAD roofing filter and performance board into the Yaesu FT-847 1st IF. These are listed as experimental VHF filter on International Radio's site. The INRAD roofing filter performance board used is the ICOM IC-765 type with INRAD's FT-847 Yaesu 45.705 Mhz crystal roofing filter.

On the INRAD board R8 is unsolder at the junction of C7, J2 and soldered to the ground side of C9. This allows a current path to ground for switching. The +8 volts for the performance board switching is derived by soldering an LM7808 voltage regulator to the input and ground leads of Q1111. It is positioned over Q1111, (near the large power leads on the AF/CNTL board) and held in place by the soldered leads. The output lead is bent over and a wire soldered to it for the +8 volts. The transceivers +8 volt buss was not used because of it's noise and hash. A simple means of switching the filter in and out can be had by mounting a toggle switch into the external die cast enclosures cover and supplying it with the +8 volts.

A more complex method of switching using the transceivers soft mode button switches can also be utilized. Epoxy glue two 2N5447 PNP TO92 transistors top down near CF1002 on the AF/CNTL board. The emitters are soldered together and tied to the +8 volts described. The collectors have individual wires soldered to them and routed to the top and out through the upper air slot behind the RF section. These go to +8T and +8R on the INRAD performance board. One base goes through a 4.7 K ohm 1/8 or 1/4 watt resistor soldered vertically to TP1013.

Test pads TP1013 and TP1014 each have shortened cathode leads of 1N4148 diodes soldered to them. The anodes are tied together and go through a 4.7 K ohm 1/8 or 1/4 watt resistor to the other transistor base. When CW or SSB is selected these test pads go low. When AM or FM is selected TP1013 goes low.

The transceiver uses its +8 volt buss for switching filters so utilizing this scheme using PNP transistors the added supply can't be higher in voltage than the buss voltage. Be very careful in construction if using this switching scheme as the FT-847 test pads and circuit traces are EXTREMELY fragile!

The cable at J3009 is unplugged at the AF/CNTL board and routed out the upper rear air slot behind the RF board. I purchased an RF cable from Yaesu parts and pulled its connectors off. After reaming the pins with a miniature drill bit these connectors were soldered to a 19 inch long RG-188A/U teflon coax. This cable is routed from J1001 on the AF/CNTL board to the top section and out the upper rear air slot also.

The cable connectors are replaceable with RFM-2100-1 which are available from online sources. Powell Electronics or [jkelect.com](http://jkelect.com) were a couple of sites. If INRAD kits this mod they may supply an RF cable of sufficient length.

The die cast enclosure for mounting the performance board is a Hammond 1590 L, Mouser part #546-1590L. It measures 4 X 2 X 1 inches. Looking at the back measure 1.820 inward from its right edge. From the lower edge measure .750 inches. Where these scribed lines intersect drill a #20 hole. Countersink it on the enclosure inside for a 4 MM x 16 MM flat head screw available at most hardware sources.

On the vertical edge of the enclosure facing the transceiver center scribe a line .300 inch from the upper lip where the cover fits. Clip off all four corners of the PC board at a 45 degree angle about half way across the existing mounting holes so it will fit and then place the PC board into the enclosure. Mark where the RF connector centers are on the enclosure. Where these three points intersect drill two 3/16 inch holes and slot them vertically so the RF connectors will fit through.

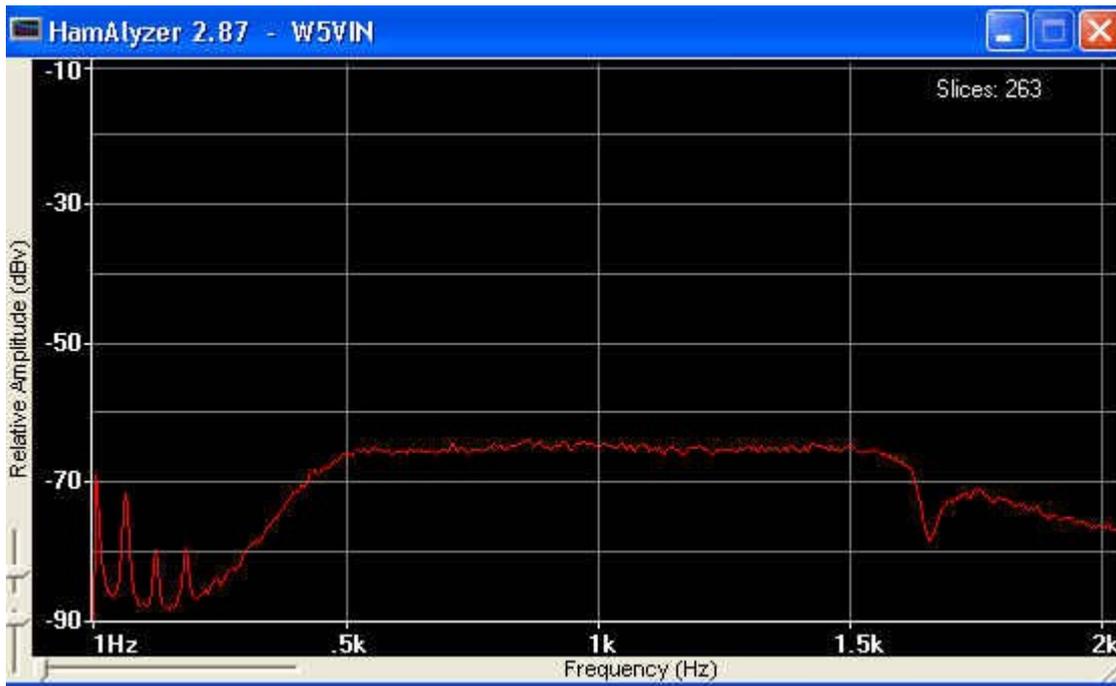
Between these slotted holes drill a hole for the +8 volt wire or two switching wires. Drill a #34 hole through the PC board in an open area between D1 and the crystal filter. Place the PC board into the enclosure and drill a #34 hole through the backside inline with the PC board hole. Insert a 4-40 screw from the backside and an internal tooth LW and 4-40 nut for a board standoff. Remember to clip off all soldered connections on the PC board to prevent shorts.

The die cast enclosure is mounted to the transceivers ground lug using the flathead screw. Do all drilling on the enclosure before mounting it to keep metal chips out of the transceiver. If one uses the toggle switch method of switching filters this is actually an easy mod. No surgery to the transceivers boards are necessary and the performance board to transceiver uses existing RF connectors. Either downloading or purchasing a service manual is a big plus. I assume no responsibility for someone damaging their rig in doing this mod. If you feel unqualified get someone knowledgeable to help.

I also experimented with the INRAD feedback amplifier by changing out the transistors with 2SC3355 lower noise units. R5 was changed to 18 ohms and R6 to 270 ohms for a circuit gain of 6 dbm. As evident by the audio spectrum sweeps quiescent receiver noise dropped by 4-5 dbm even with the added 6 dbm gain of the feedback amplifier. MDS with DG2IAQ's Shottsky diode bandpass filter mod approaches -135 to -138 dbm in CW and -133 to -135 dbm in SSB. The bandpass diode mod is a big plus in lowering receiver quiescent noise and improving sensitivity. Performance wise it's a great mod and does what all of the INRAD series roofing filters are designed for. Simply put if it falls out of the roofing filters passband it doesn't go into the receiver.

The miniature drill bit mentioned is a pin vise drill bit set used for cleaning acetylene torches and are great for cleaning solder from thru holes. They can be purchased from welding supply sources but specify the drill set tip cleaner.





73' Charlie W5VIN

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