IC-756Pro3 IF Tap For HF SDRs

The info for this mod was given to me on the SDR-IQ Yahoo news group from Tim Taylor and I believe he found the info on the SDR-14 Yahoo group from Kjell. Thank you guys.

I made this doc because I had trouble finding this info. I lay no claim to being clever enough to sort this out for myself and I would not have done this mod if the information wasn't given to me from the work of other people.

Warning: *Modern radios contain components which may be damaged by static discharge. Precautions must be taken to eliminate any static electricity build-up 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.*

Do this at you own risk. If you fry it – it's your problem.

Matt -VK2DAG-

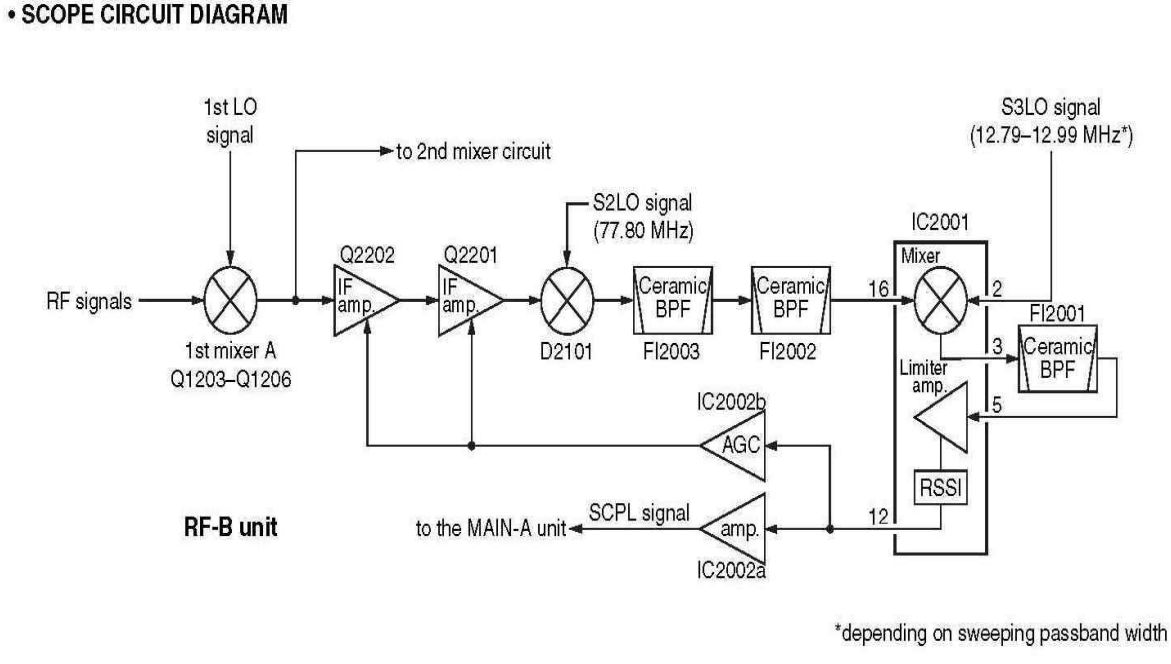

Figure 1

The IF for the IC-756PRO series of radios is up around 64 MHz and is outside of the range of most of the HF SDRs doing the rounds. So a tap point that is below 30 MHz needed to be found. The spectrum scope receiver takes its signals after the A band 64.445 MHz IF filter and mixes it with the S2LO freq of 74.800 to give us a handy 13.345 MHz before it mixes it down to drive the spectrum scope. All of the 756 series use the same method for the spectrum scope. An added bonus of tapping the spectrum scope receiver is that you aren't screwing around with your radio's main IF chain and any loading on the receiver will just show up on the spectrum scope display. No biggie.

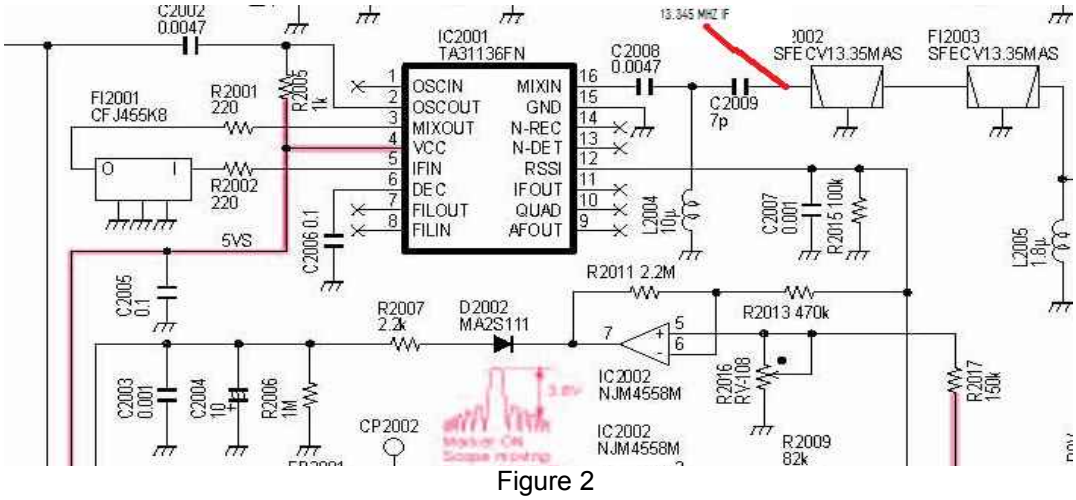

Figure 2

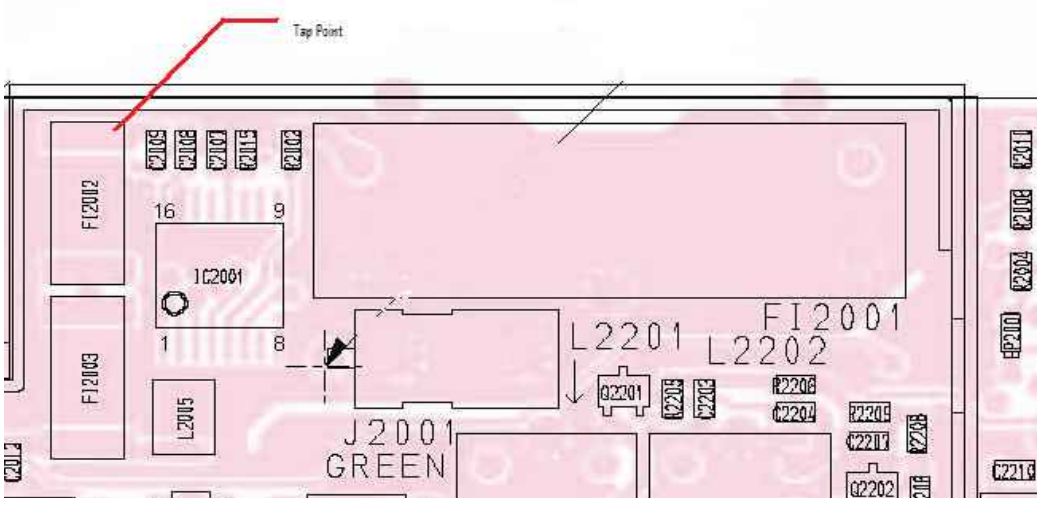

Figure 3

The point we want is the junction of C2009 and FL2002.

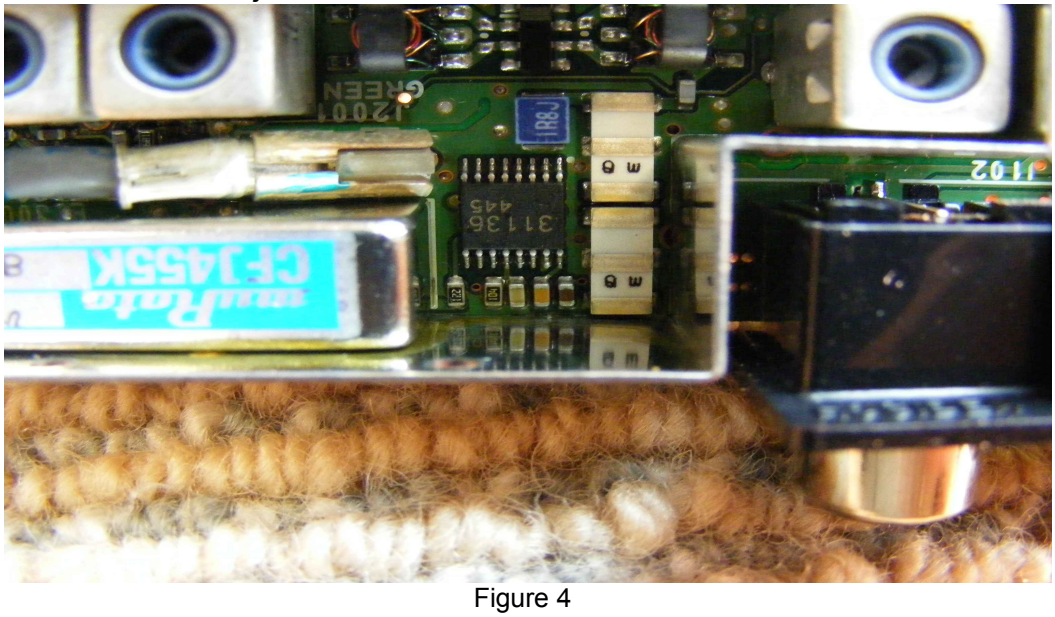
Figure 4

The end of FL2002 is easy to get so you don't have to disconnect all the cables and pull the PCB out of the radio.

Preparing the Radio for Modification

1. Remove the DC power cord from the transceiver.

Figure 5

2. Place the radio on a soft surface with the front panel facing you. Remove the top and bottom covers (Fig 5).

3. Turn the radio upside down and remove the shield plate on the left side. The RF-B unit is the board at the rear. Pop the top cover of the shielded enclosure at the rear of the radio closest to the “Transverter” and “Receive Antenna” RCA connectors (next to the antenna tuner connector). See Fig. 6.

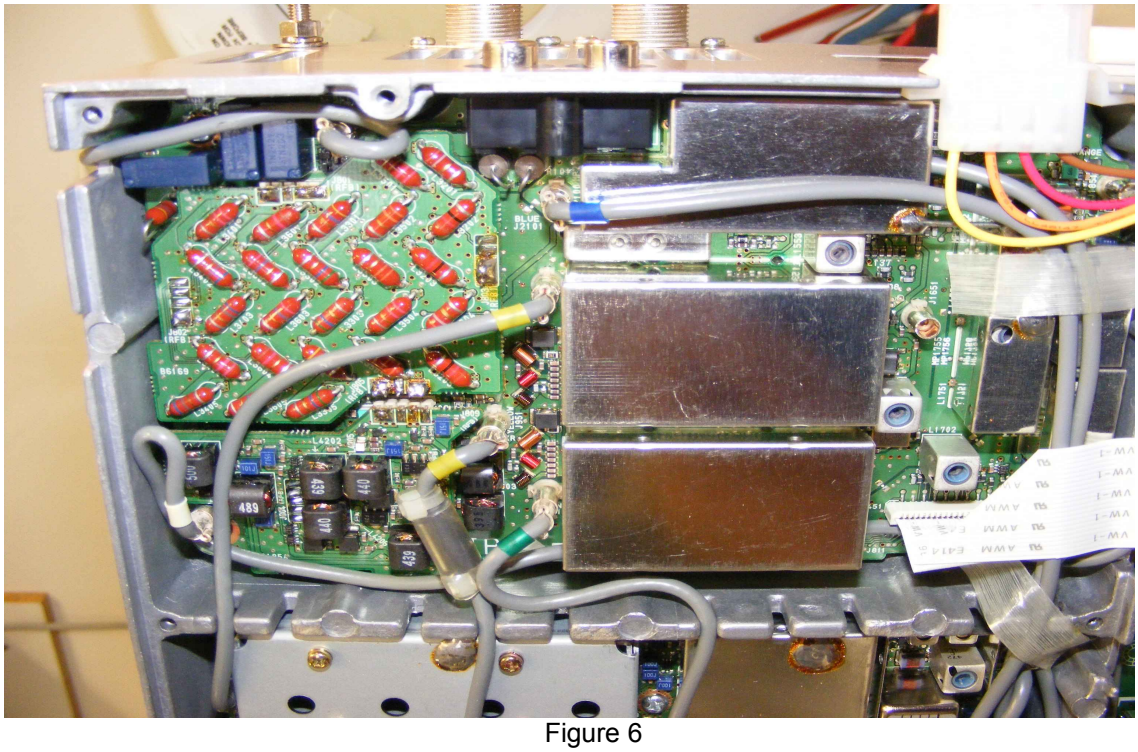

Figure 6

4. Cut and strip a piece of Teflon coax that is long enough to reach from the inside of the enclosure to where you are going to mount the buffer/amp circuit board.

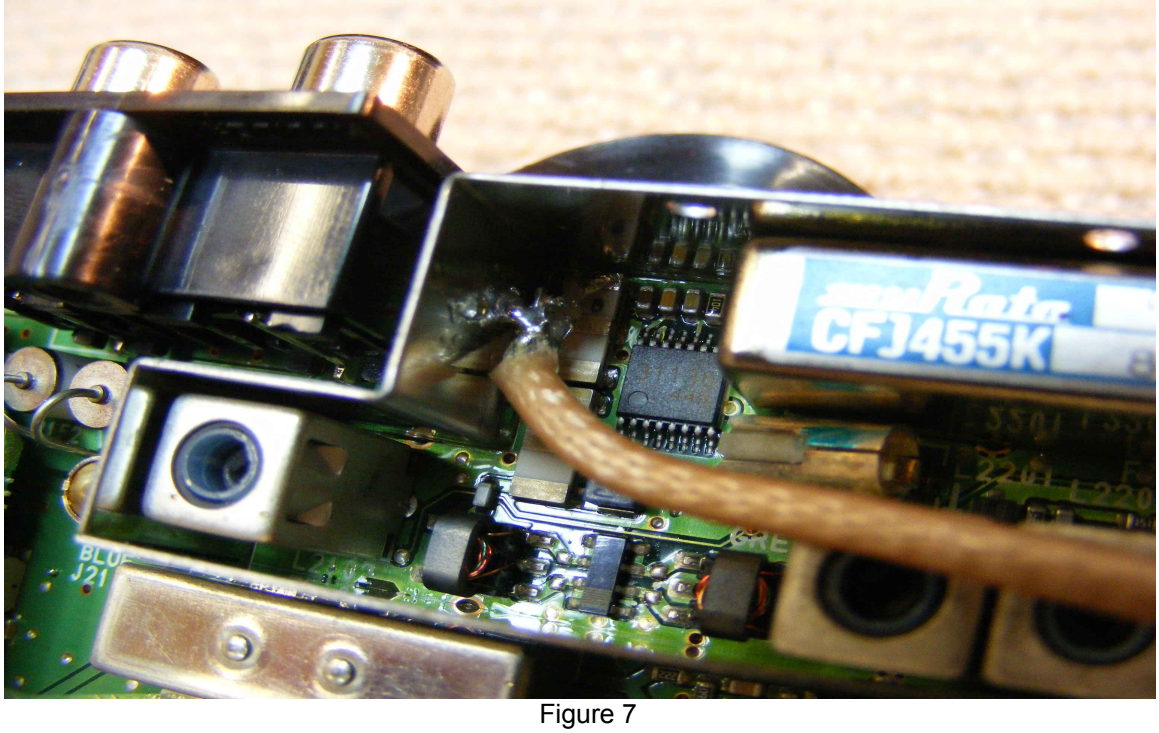

Figure 7

5. Solder the centre of the coax to the end of the filter. The filter end tabs are easy to solder to and are much easier to get to than the end of C9001. Solder the braid of the coax to the side of the enclosure (Fig 7).

6.The Teflon cable will fit through the hole with the other cable from the enclosure. Pop the lid back on.

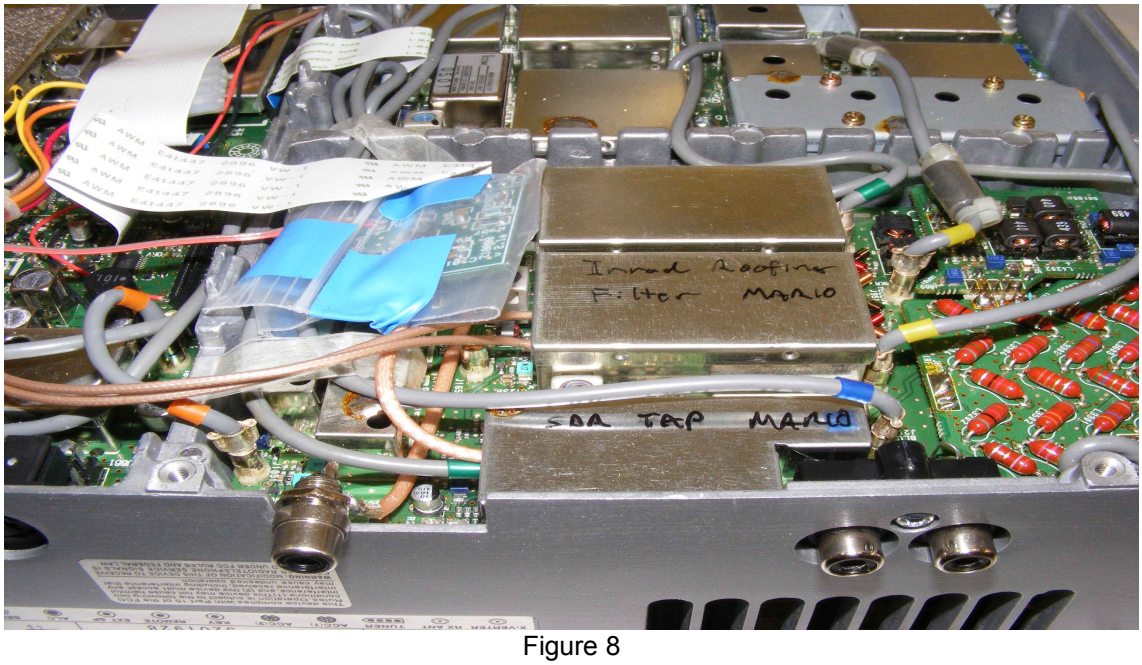

Figure 8

7. I fitted the Clifton Labs Buffer/Amp next to the IF filter enclosures and wrapped it in a plastic bag to insulate it (nothing flash here)(Fig 8).

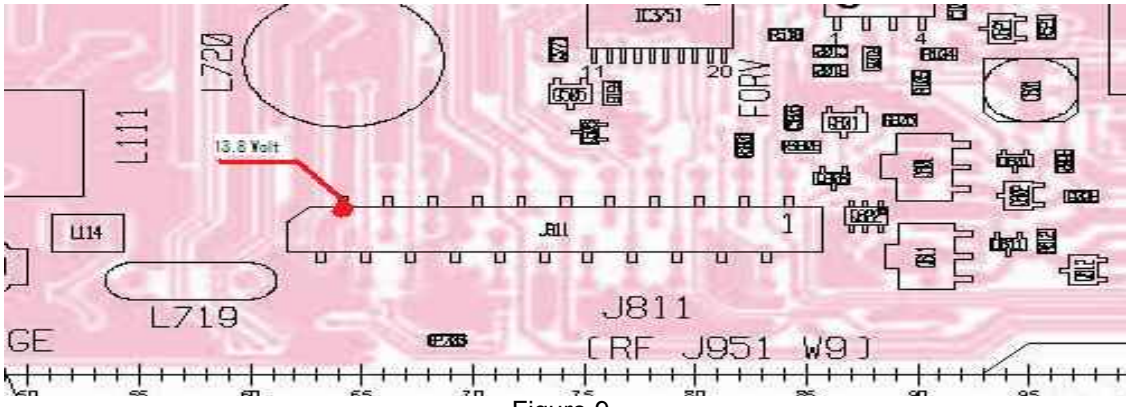

Figure 9

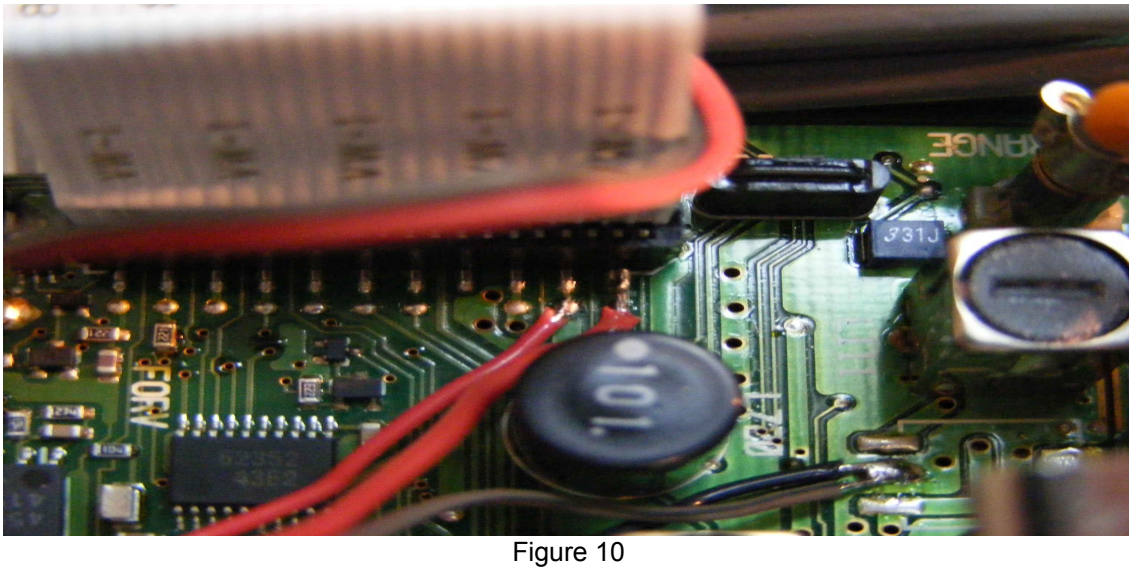

Figure 10

8.I found power for the buffer on connector J811 on the Main Unit A PCB (Fig 9).
The red wire on the left is 8 volts for the Inrad roofing filter. The red right wire on the end of the connector is the 13.8 volts for the Clifton Labs Buffer/Amp. Deck is to the far right (Fig 10).

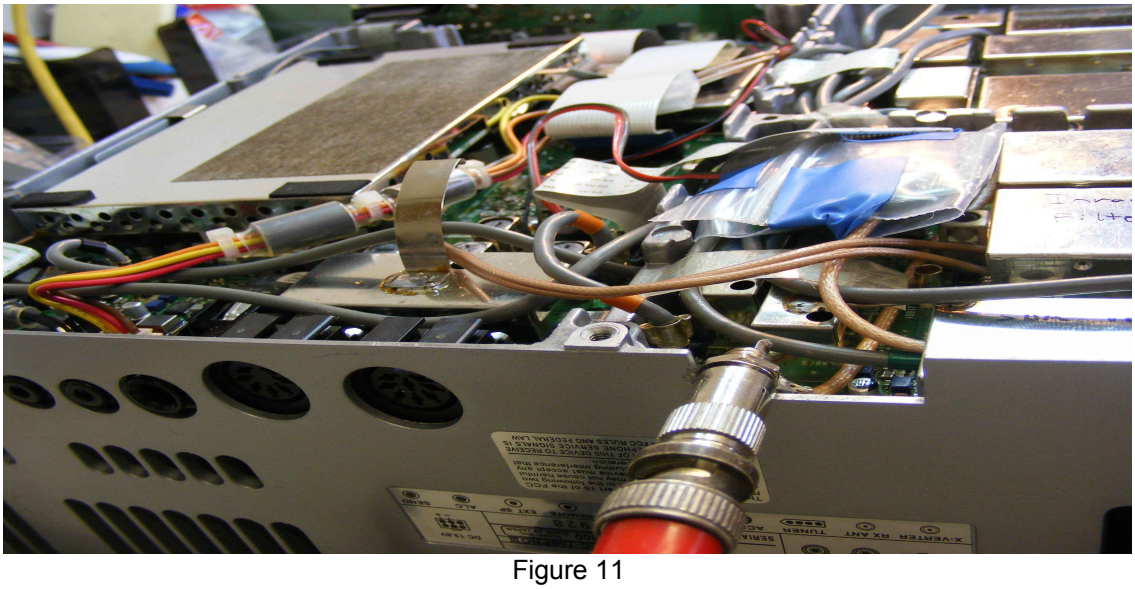
Figure 11

9.I didn't want to drill holes in my radio and I don't use an external antenna tuner so I slipped the antenna tuner connector off and secured it inside the radio. I then mounted an RCA connector on the edge of the hole and screwed the shield plate back on, which also holds the connector in place (Fig 11).

10. Put your radio back together and test.

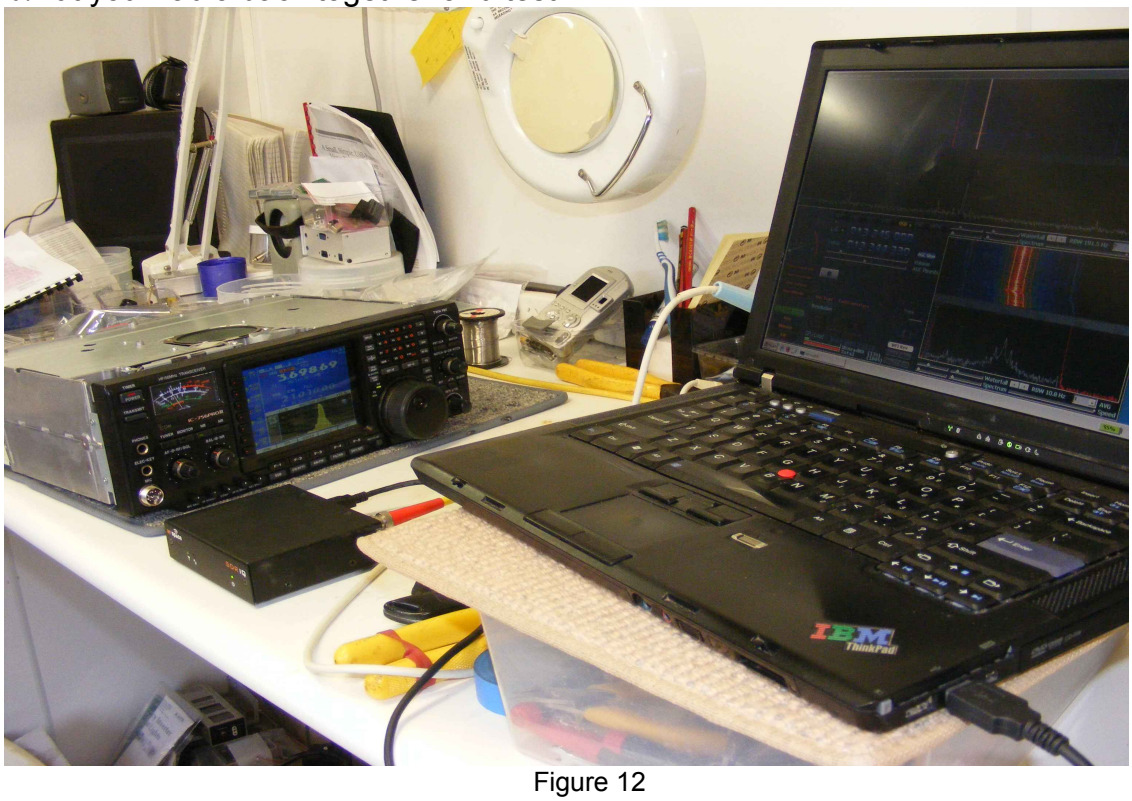

Figure 12

Figure 13

At the same time I did this mod I also added an Inrad Roofing filter. A little bit more involved! See Fig 13.

I set the gain in the Clifton Labs Buffer/Amp to -2.5 dB. Any more gain caused the display to have a large dip in the middle. You don't have to use Clifton Labs kits any JFet buffer amp design around will do the job. You just need some isolation between the spectrum scope's receiver and the input for your SDR.

11. Fire up your preferred SDR software tuned to 13.345 MHz and smile at your cleverness.

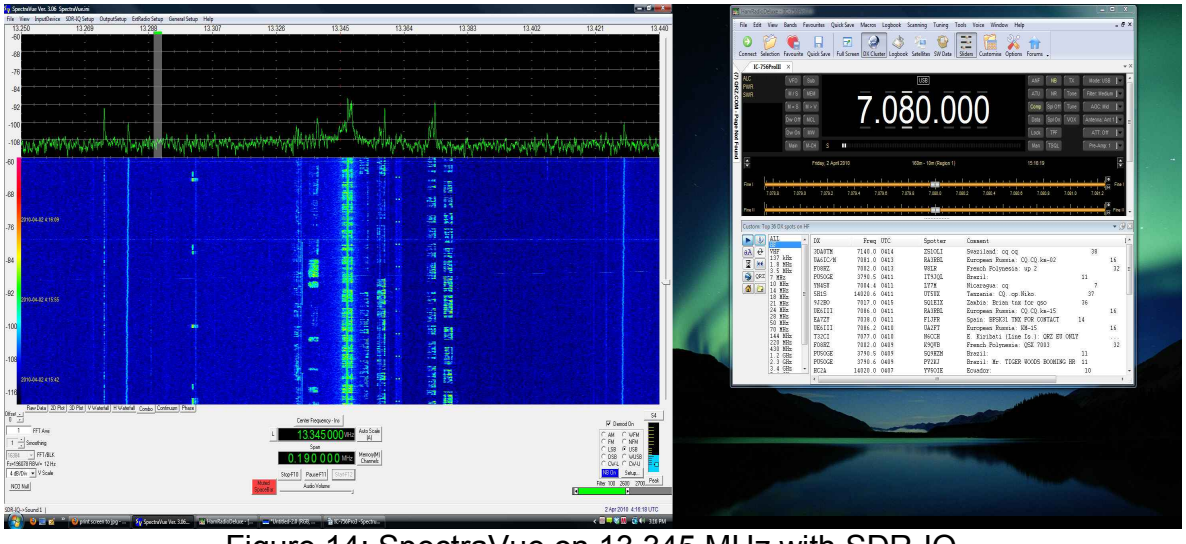

Figure 14: SpectraVue on 13.345 MHz with SDR-IQ

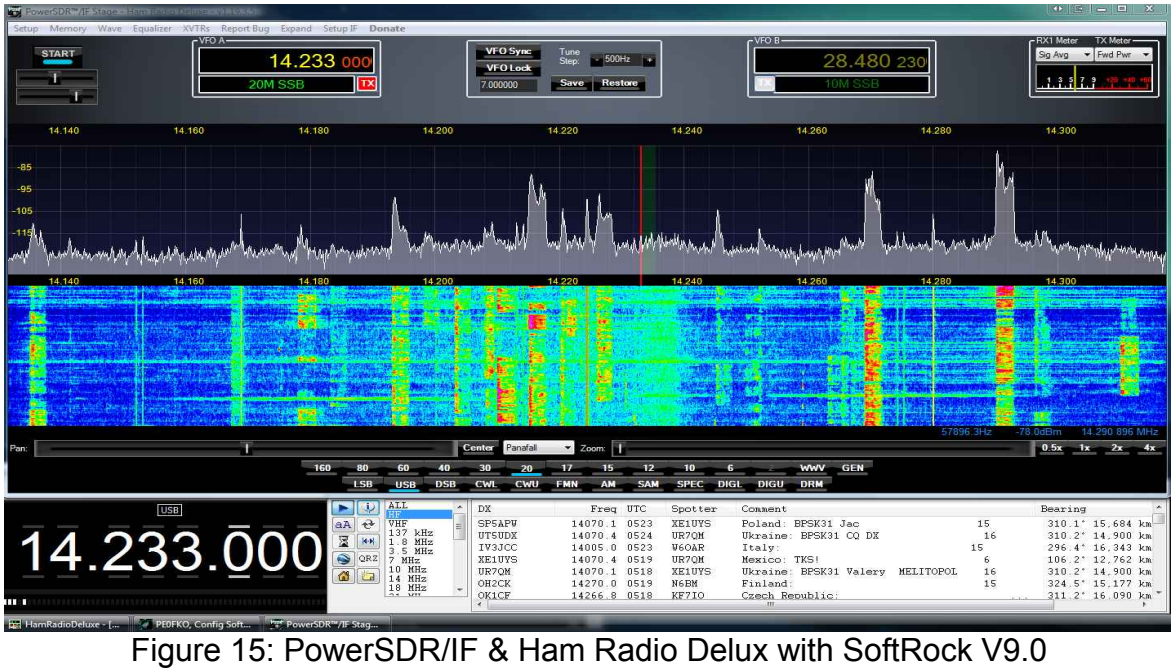

Figure 15: PowerSDR/IF & Ham Radio Delux with SoftRock V9.0

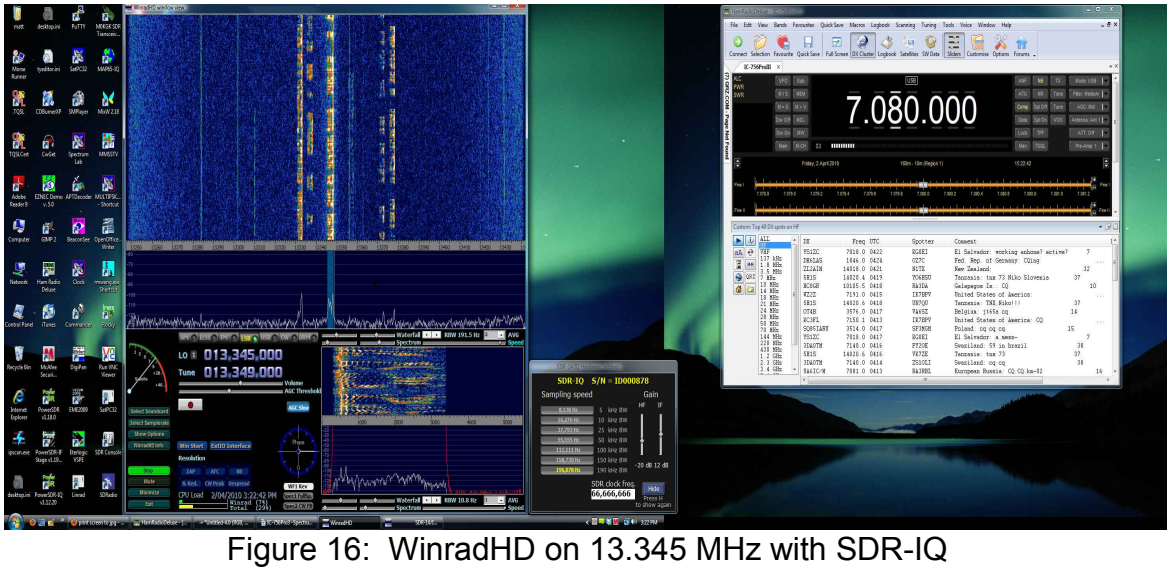

Figure 16: WinradHD on 13.345 MHz with SDR-IQ