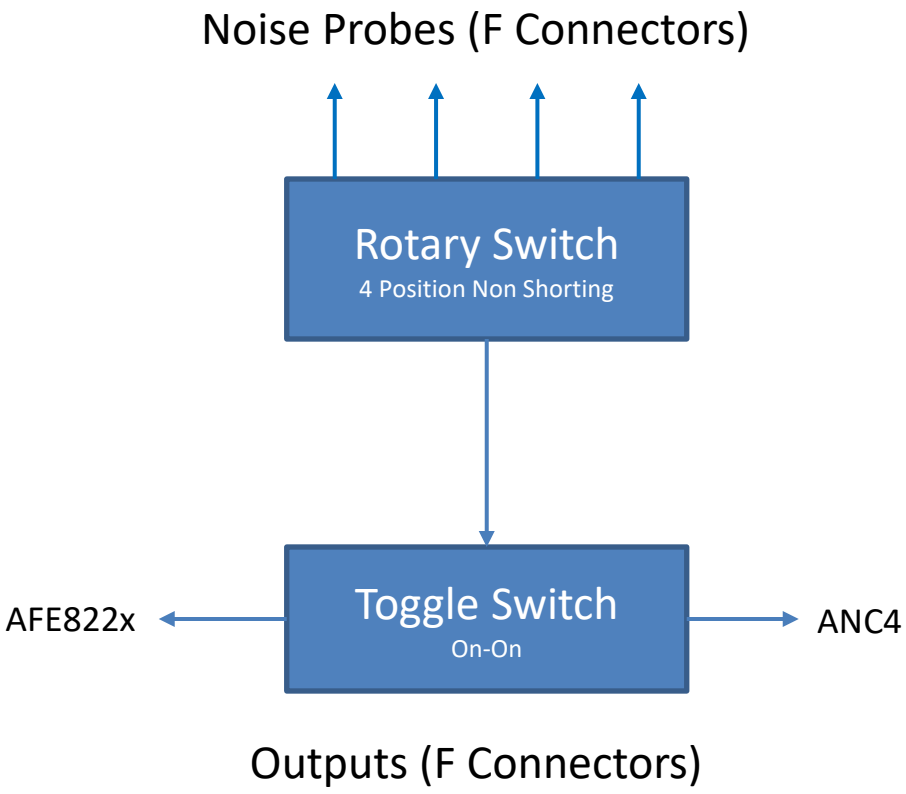


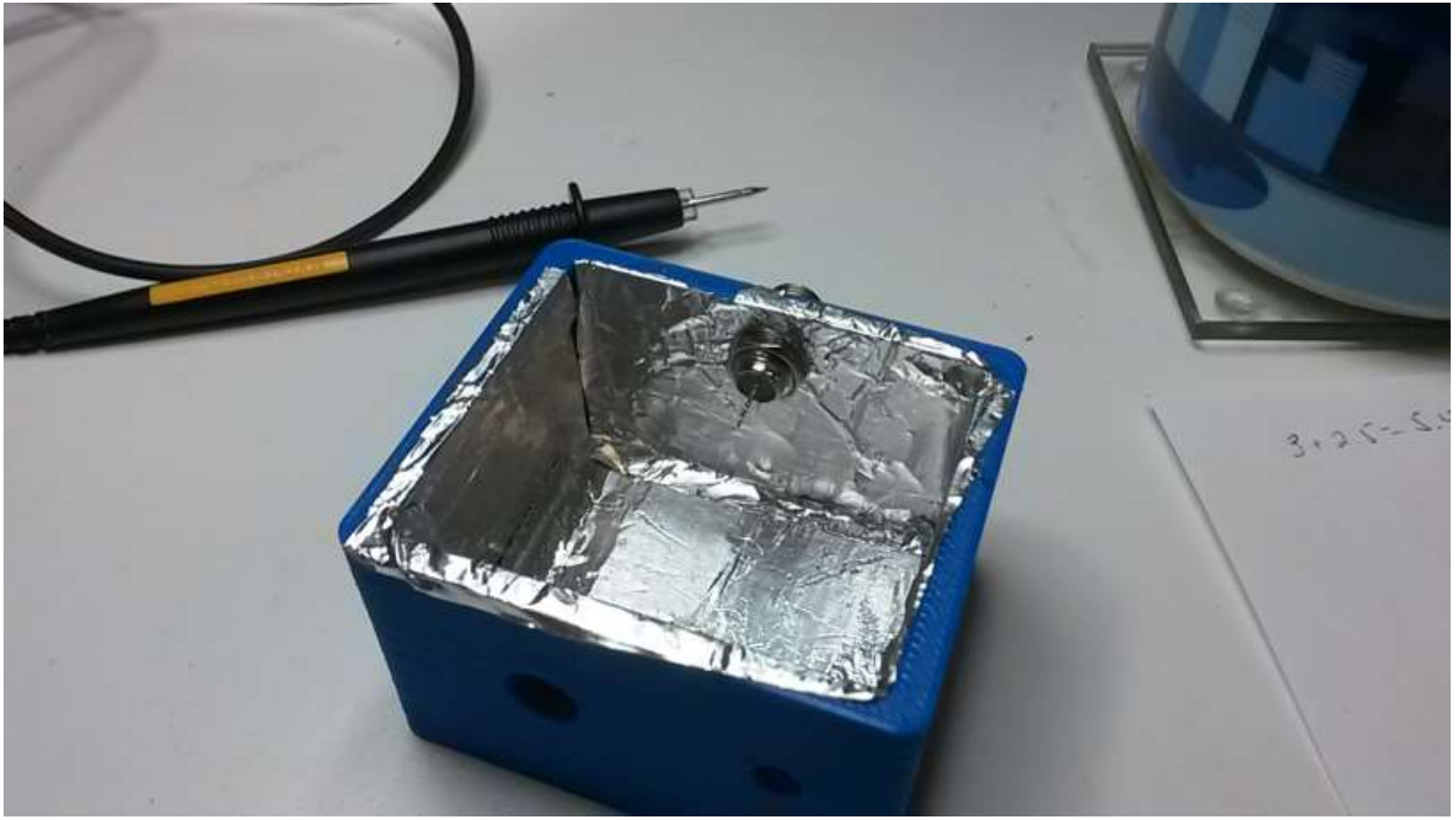
Recently, I acquired the Afedri AFE822x dual channel coherent SDR. I wanted a simple way to switch my noise probe antennas between the Afedri and the ANC4 phasing unit, which I use for all my other receivers. The solution would be a shielded switch box.

In my junk box, I found a 12 position rotary switch (non shorting), a miniature On-On toggle switch, and a bunch for chassis-style F connectors. I use RG6 coax for running receiver connections between different radios. The “cable television” patch cords work fine and we all have a ton of them in the junk box. It’s easy to adapt the F connectors with BNC, PL-259 or SMA adapters to hook up the radios. (The slight impedance mismatch does not matter on receive HF.)

So, I decided to use a 3D printed plastic box, and add shielding. Layout was simple, with six F Connections on the back, and mounts for the toggle and rotary switched on the front. Easy to print a 60 by 70 by 40 mm. box. I included extrusions for the F connector nuts to hold them tight, as well as a key hole for rotary switch stability. The PLA print took around 3 hours. Since the holes were small, I did not bother with “supports”.

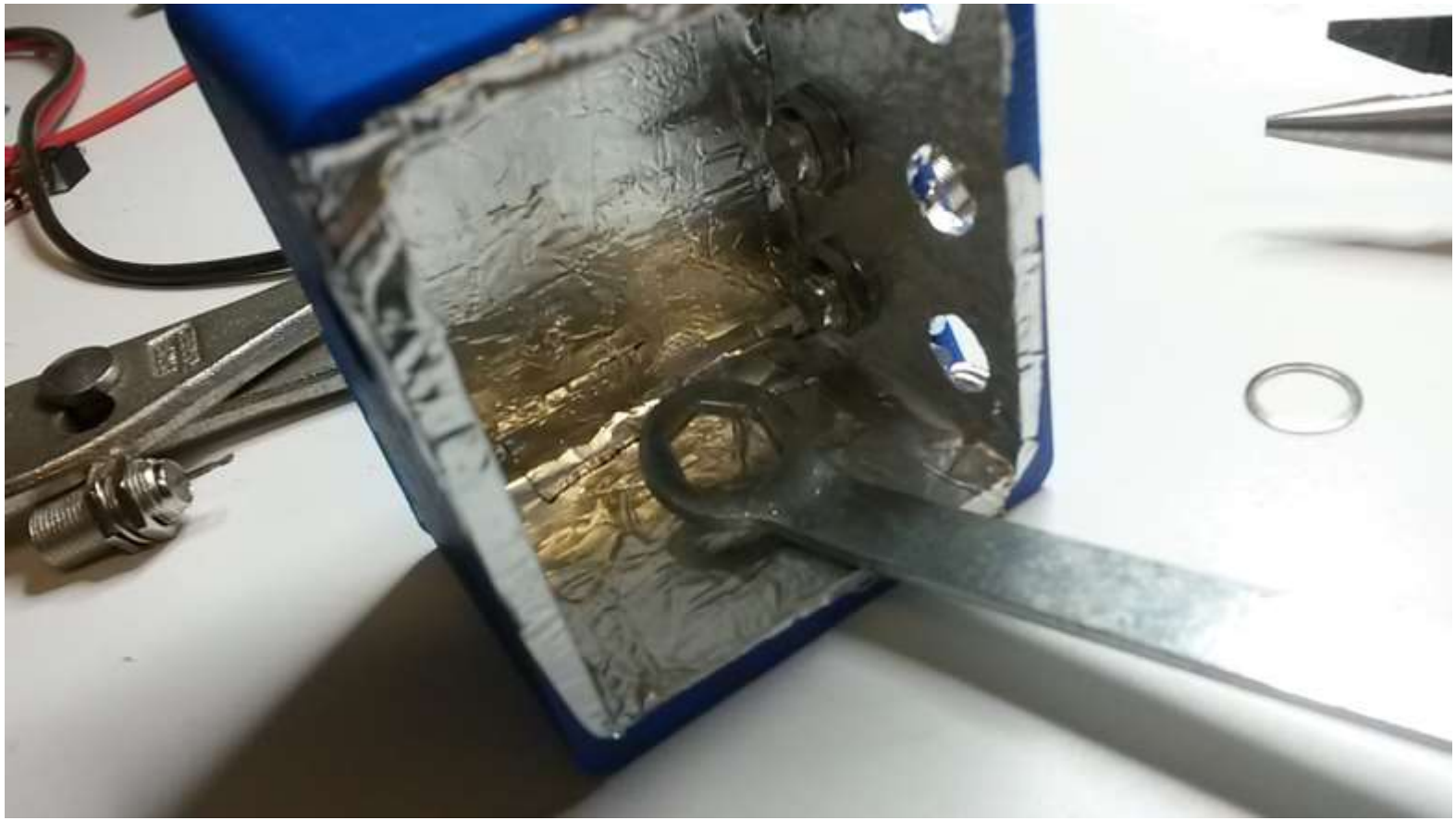
For shielding, I covered the inside of the plastic box with Nashua 330X Extreme Weather HVAC Foil Tape from Home Depot. The aluminum foil is 3.5 mil or about 0.1 mm. thick. Acrylic adhesive on the back.

After covering the inside walls, I confirmed shielding with a conductivity test. All good.

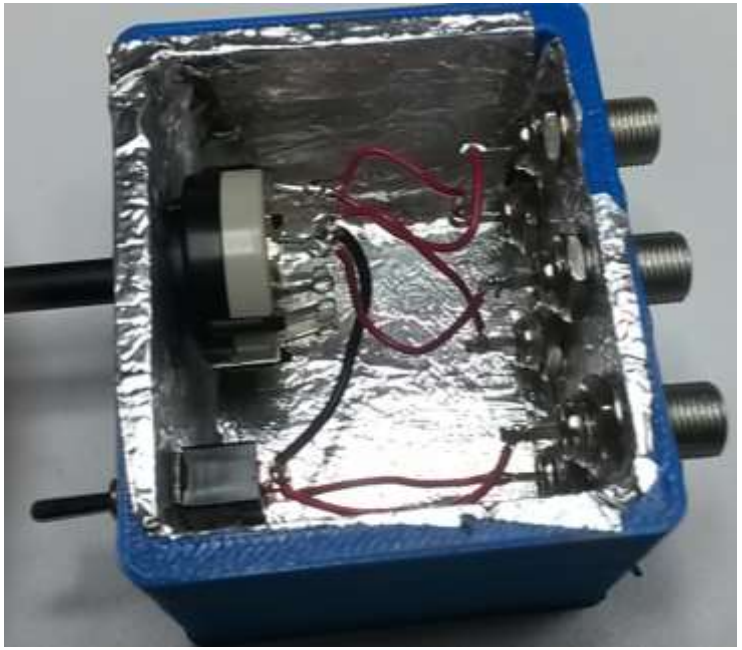


I also did a conductivity test with one F connector to make sure that the connector ground was physically well connected to the foil when screwed tight.

Assembly proceeded by seating the switches and F connectors one at a time.
Made sure to capture a physical connection to the foil as much as possible.



If you build something like this, do some advanced planning to make sure there is enough space to get a tool in the box to tighten the nuts on the connectors.



I measured the wire lengths needed and soldered the wires to the switches before mounting. Then, finishing the connections one-by-one. Finally, check for continuity or shorts. In theory, at HF with small signals, this should all work as well as a metal box.

I also printed a base cover for the switch, and shielded with more foil. The base is press fit into the main switch box. The captured nut in the middle is so I have the option of using a screw to mount the box securely in the future.

Finally, with all cables attached, I mounted the switch box in the shack. Also printed a knob for the rotary switch and added some labelling.