The NVARC “Ugly” Filter Project

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The 40 Meter Filter

Parts List

This section updated 20 June 2009

Case
1 each Power Supply Case with hardware
1 each internal shield

The coils for the 40 meter filter use one inch PVC pipe as the coil form. The form outside diameter is 1.315 inches and the other dimensions are listed below.

Coil #	Pipe Size	Pipe Length	# Turns	Winding Length
L1,3,4	1 inch	2-1/4 inches	13	1.30 in (1-5/16)
L2	1 inch	1-3/4 inches	4	0.40 inches

#14 solid conductor insulated wire.
3 each 72 inches
1 each 24 inches

C1 – 2 each 56 pf 3KV Panasonic P/N ECC-A3F560JGE

C2 – 2 each 68 pf 3KV Panasonic P/N ECC-A3F680JGE

C3 – 1 each 330 pf 1KV Panasonic P/N ECC-A3A331JGE, 270 pf 1KV Panasonic P/N ECC-A3A271JGE, 33 pf 1KV Panasonic P/N ECC-A3A330JGE

C4 – 2 each 82 pf 3KV Panasonic P/N ECC-A3F820JGE

Mounting hardware 4-40 brass
3 each 1-1/4 machine screws
19 each ¼ machine screws
23 each nuts
5 each washers

Misc
2 each SO-239 connectors
1 each ground lug
Connector labels

Construction Notes

This section updated 1 September 2008

The coils for the 40 meter filter use one inch PVC pipe as the coil form. The form dimensions are listed below.

The coils are wound using #14 solid conductor insulated wire.

Coil #	Pipe Size	Pipe Length	# Turns	Winding Length
1, 3, 4	1 inch	2-1/4 inches	13	1.30 inches
2	1 inch	1-3/4 inches	4	0.40 inches

The length of the actual coil winding is for reference purposes.

Prepare the case

Drill the mounting holes for connectors, coil mounting hardware, and shield.

Prepare the horizontal coils per the general instructions. The shorter vertical mounted coil should have the lead that comes out closest to the end of the coil form trimmed as a terminal post. The opposite end should be fed out its respective end, stripped, and formed into a loop that extends from coil such that when stood on end it can be attached to the base of the case with a 4-40 X ¼ inch screw, flat washer and nut. See photos for relative position.

For the capacitors that require two or more in parallel prepare the capacitors by gently twisting the leads one turn and soldering the entire length.

Mount the connectors, coil supporting hardware, and lugs.

Mount L3 first so you can swing it to get the internal nut in place.

Mount the vertical coil L2. See above for discussion and photos for position.

Mount L1 and L4.

You will need the entire length of C3's leads. Form one end of C3 into a small hook at a right angle to the lead. Attach the hook on C3 to the terminal formed by the lead on the top of L3. Slip the lower lead in to the lug at the bottom of the L3 mounting screw. Bend the lug up if necessary.

Install the rest of the capacitors and solder in place.

Mount the shield to two sides of the cover along the center line with four 4-40 X ¼ inch brass machine screws and nuts so that it separates the input and output coils. Drill clearance holes in the base and tap holes in the shield to secure it in place when the cover is installed.

Photos

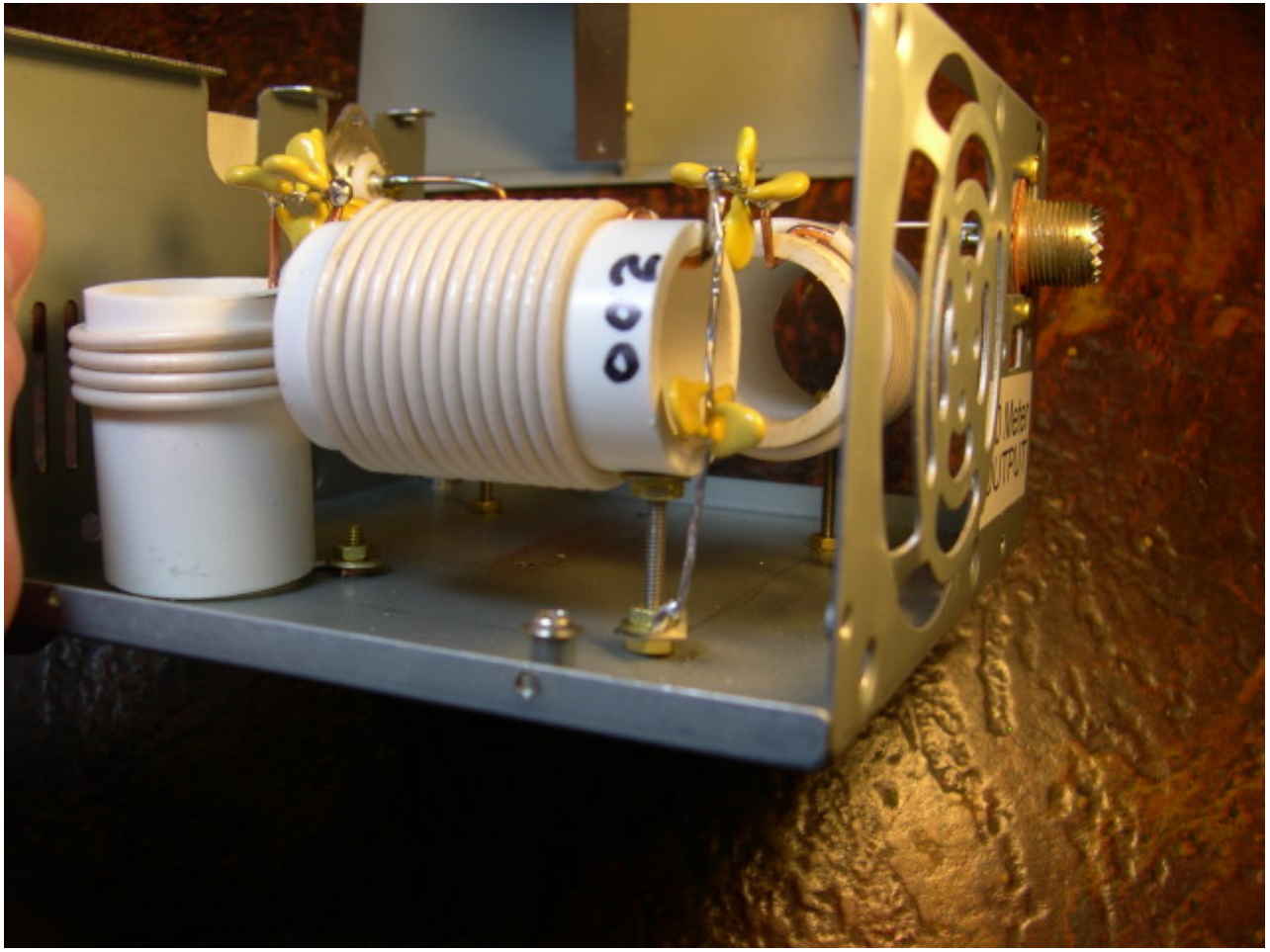

Figure 1: Capacitor and middle coil end of filter. Note the use of the ground lug at the base end of the mounting bolt to connect the shunt capacitors. See the fanned capacitors at the top right and the vertical coil mounted by the coil wire formed into a hook attached with a screw, washer and nut through the base. [high resolution version]

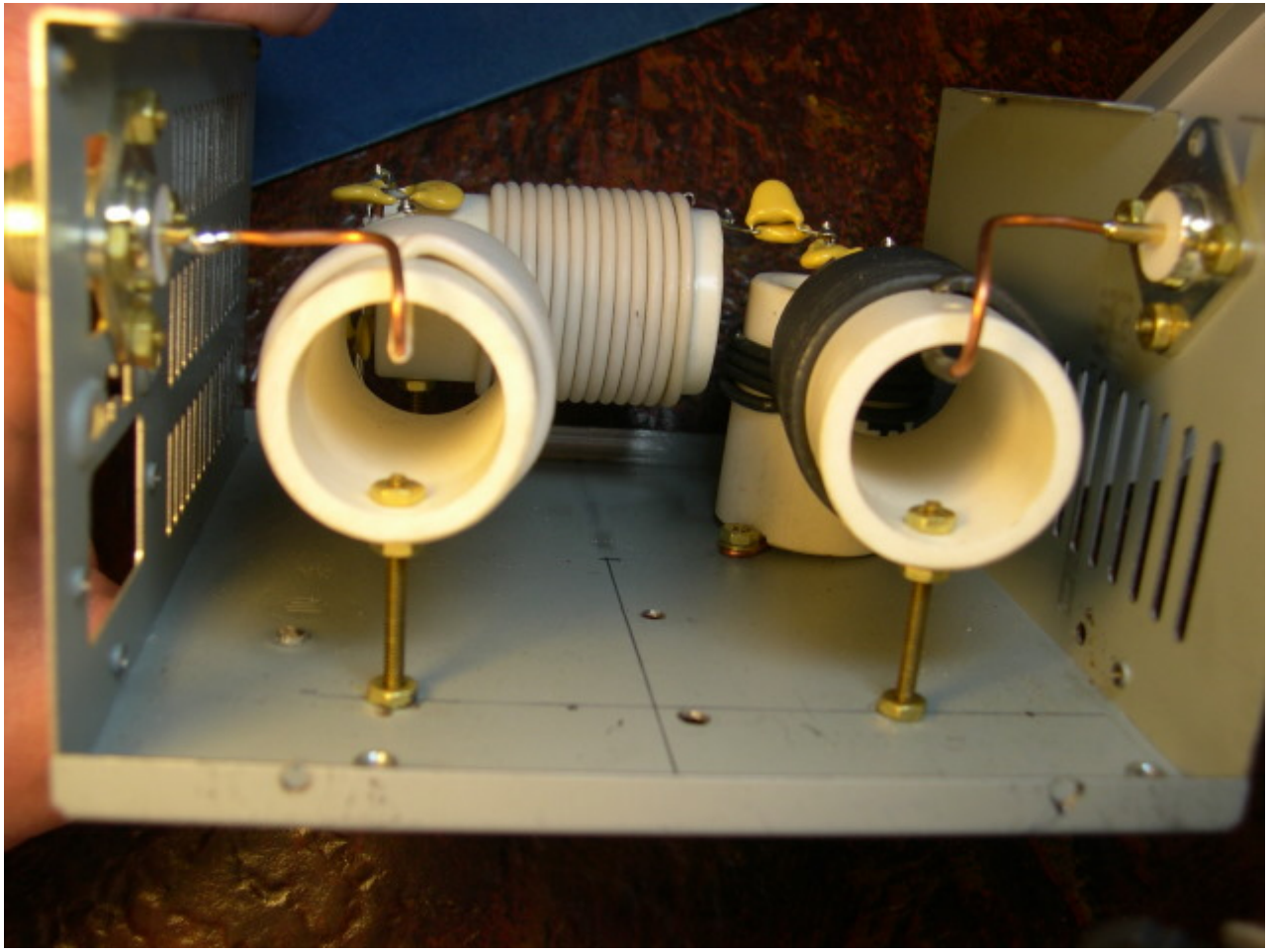

Figure 2: Connector end of case showing coil to input and output connectors. Also showing the coil mounting hardware of nut and washer on outside and nut on inside. [high resolution version]

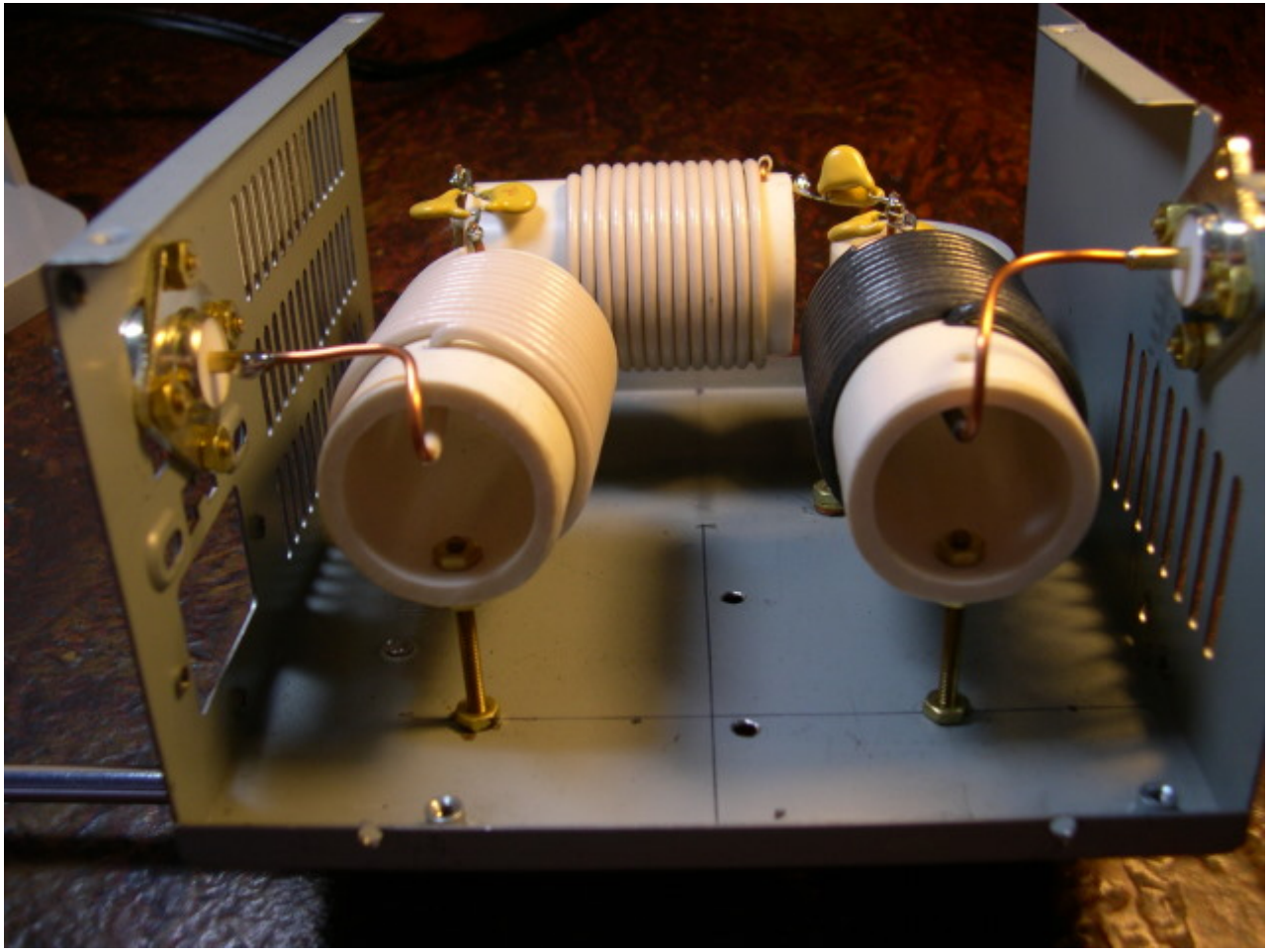

Figure 3: Connector end showing the coil mounting detail. A small notch in the base end of the vertical coil helps it sit flat on the base. [high resolution version]

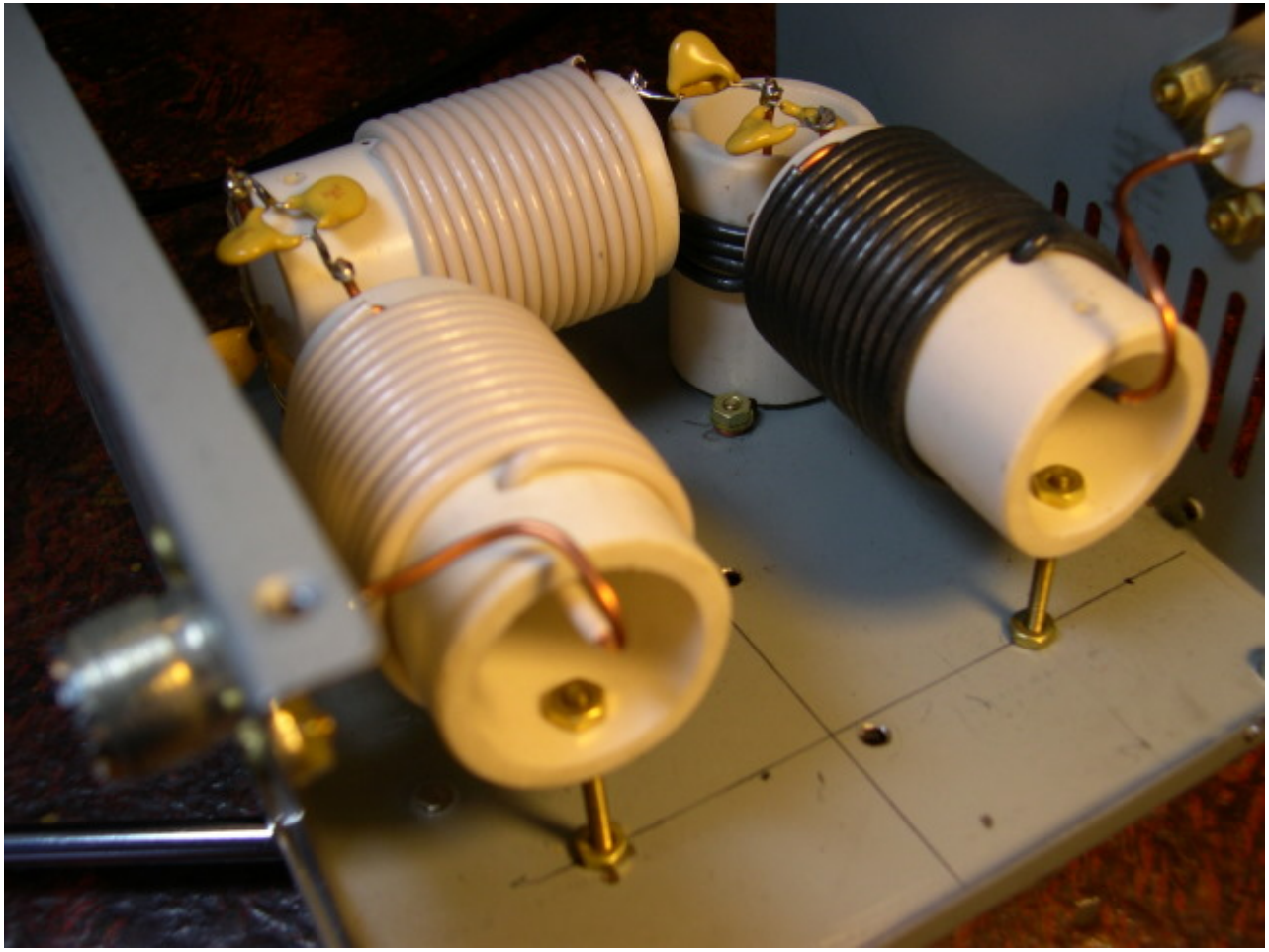

Figure 4: More detail of the capacitor wiring. [high resolution version]

Bench Test Results

Figure 5: Attenuation vs. frequency [full resolution version]

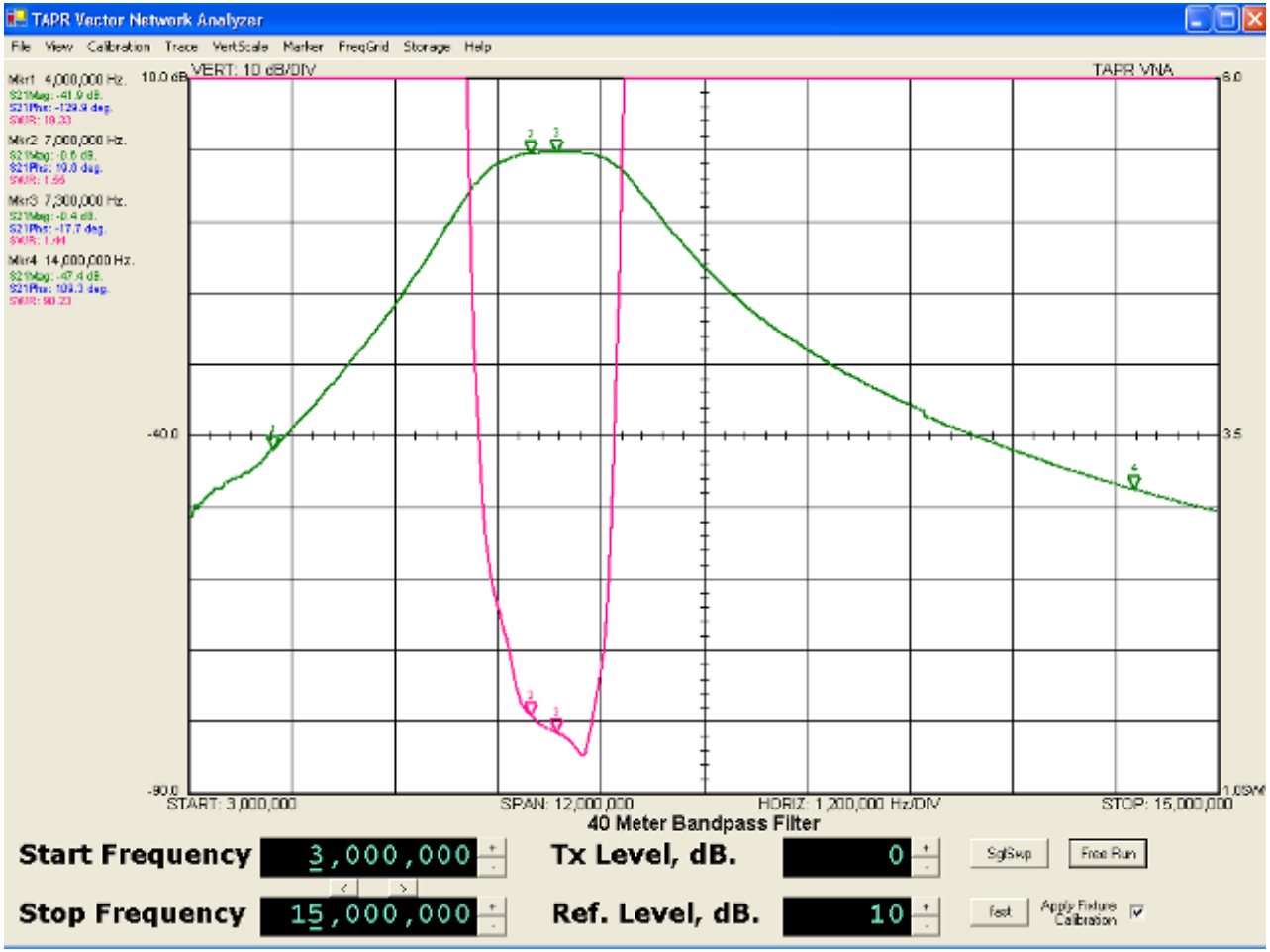

Figure 6: SWR vs. frequency [full resolution version]

Change History:

2009-06-20 [RRS] Corrected the figure for the outside pipe diameter for the 1" PVC form

2008-09-01 [RRS] Inductor designations in the parts lists changed to match the schematic. The text reference to "vertical coil L2" was correct.

Updated $Date: 2009-06-20 22:25:11 +0000 (Sat, 20 Jun 2009) $