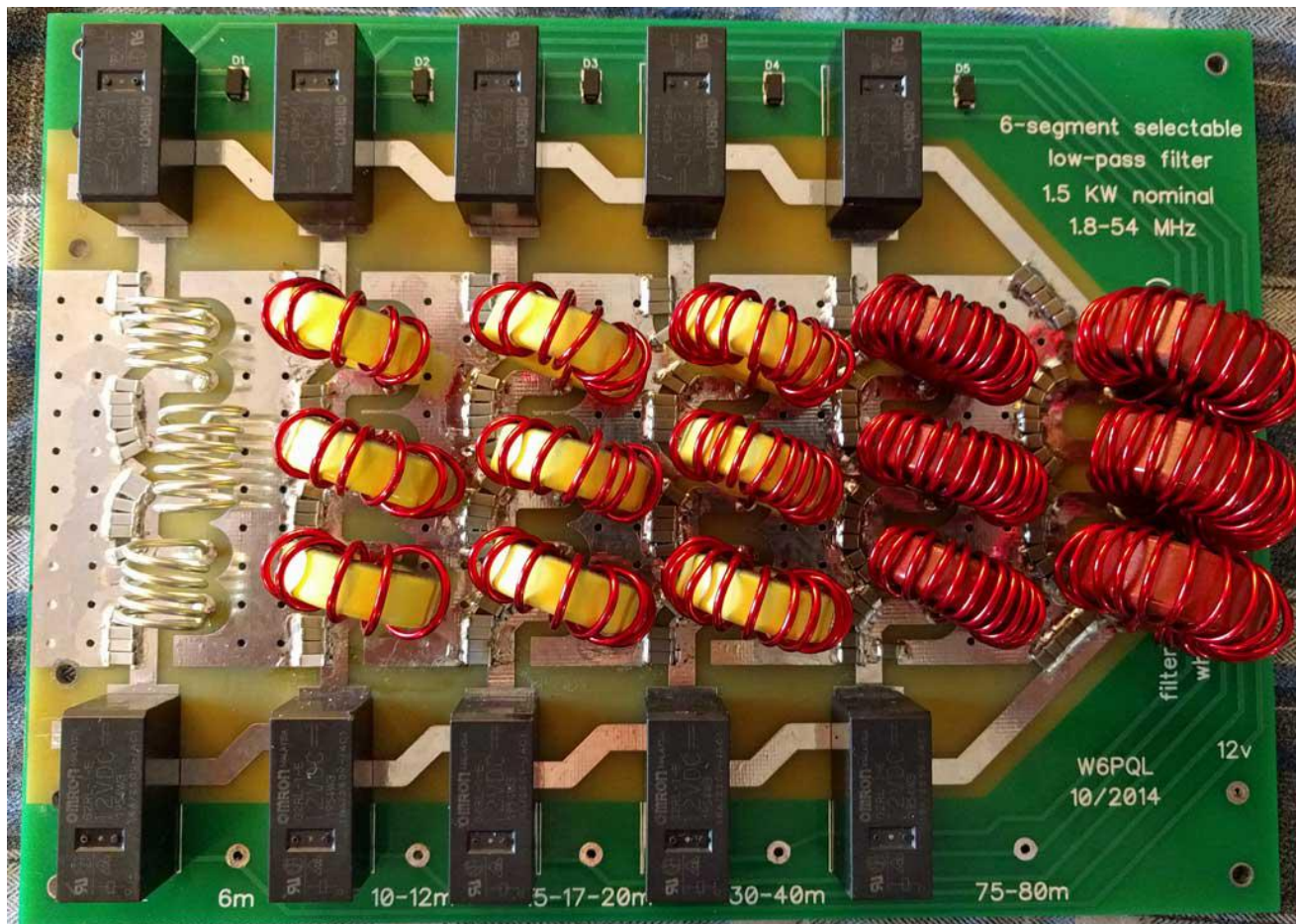


2 KW Low Pass Filter for 160-6 Meters (rev 6)

2-device amplifier pallets are offered by several makers, and gaining popularity as legal-limit amplifiers with ample headroom; this filter configuration accommodates the higher power levels and elevated 2nd harmonic content characteristic of these different amplifier designs. This version has the following changes:

- All filter sections were converted to 7-pole Chebyshev by adding two additional poles to each 5-pole segment; this provides steeper cut-off skirts and additional harmonic suppression.
- **The 15 meter section was moved** from the 20-17 meter segment to the 12-10 meter segment. This made it easier to filter 20 and 17, so now these segments are 20-17, and 15-10 (the pc board markings will be revised when board stock is re-ordered).
- Larger ferrite cores are used in the 20-17 and 15-10 meter segments
- The core material used in the 40-10 meter segments was changed to type 6
- The 6m filter section elements were changed to air-core inductors (ferrite is not necessary there)

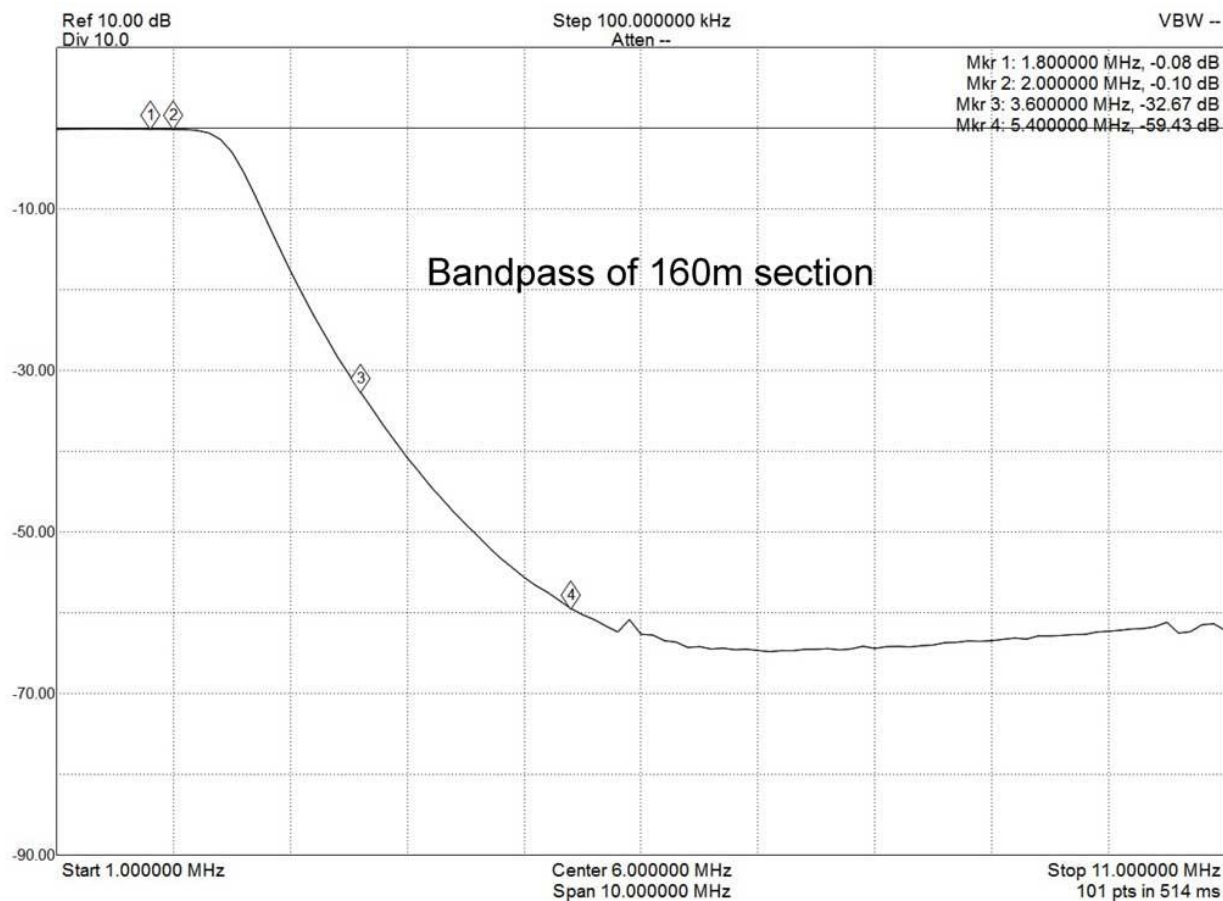
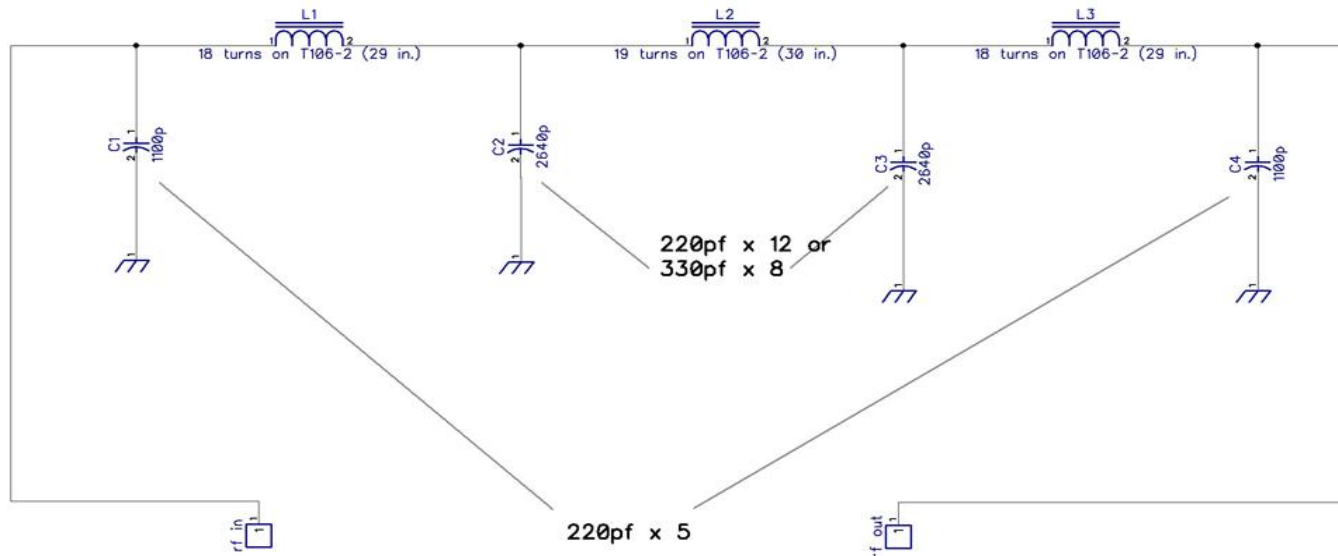


Note: If using this filter for the W6PQL single amplifier pallet, 3rd harmonic levels returned to the rf deck by this type of filter can be 100 watts or more at 1kw output, and will interfere with proper operation. Optimum performance is achieved with a stand-off cable length of 34 inches; this is the recommended total coax length from the output of the rf deck to the input of the filter, and will minimize the interference caused by reflected power.

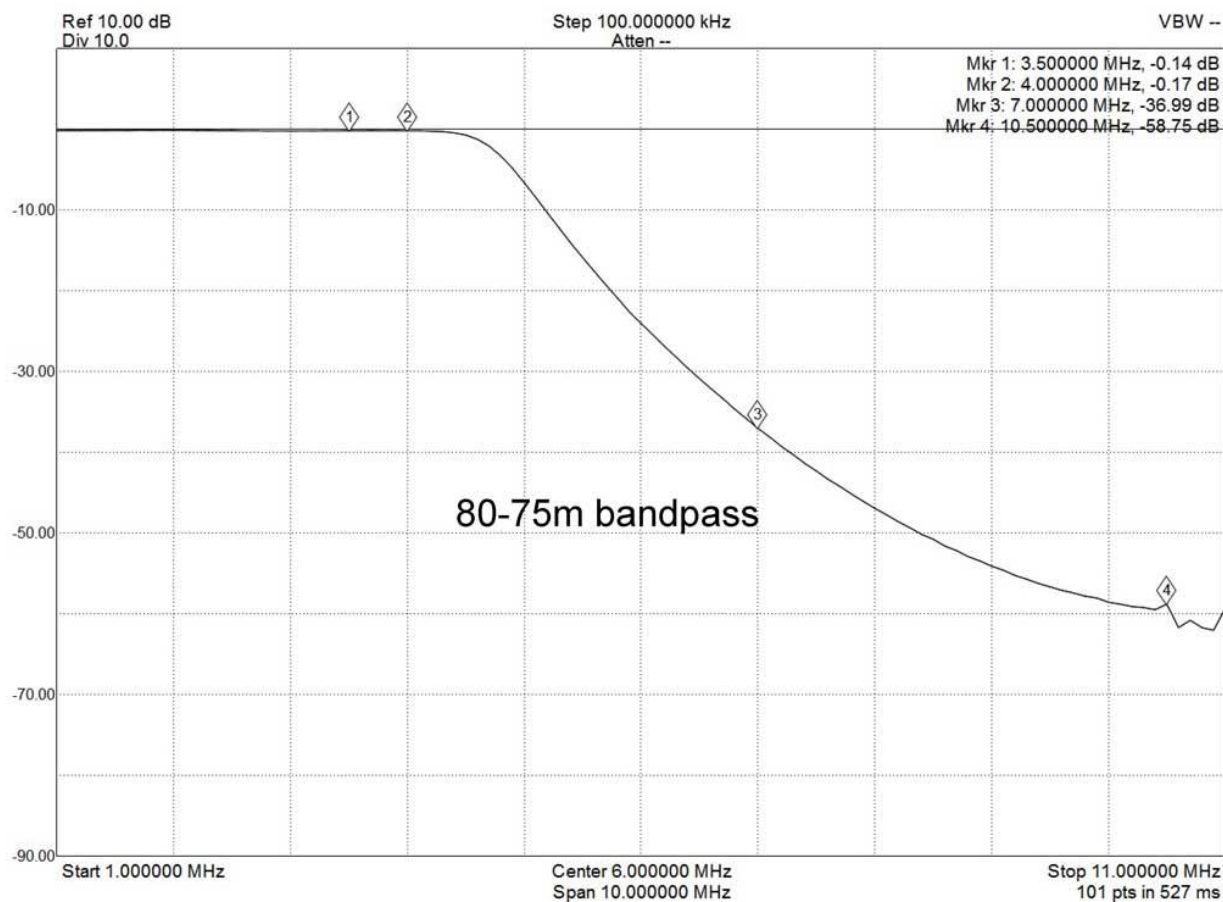
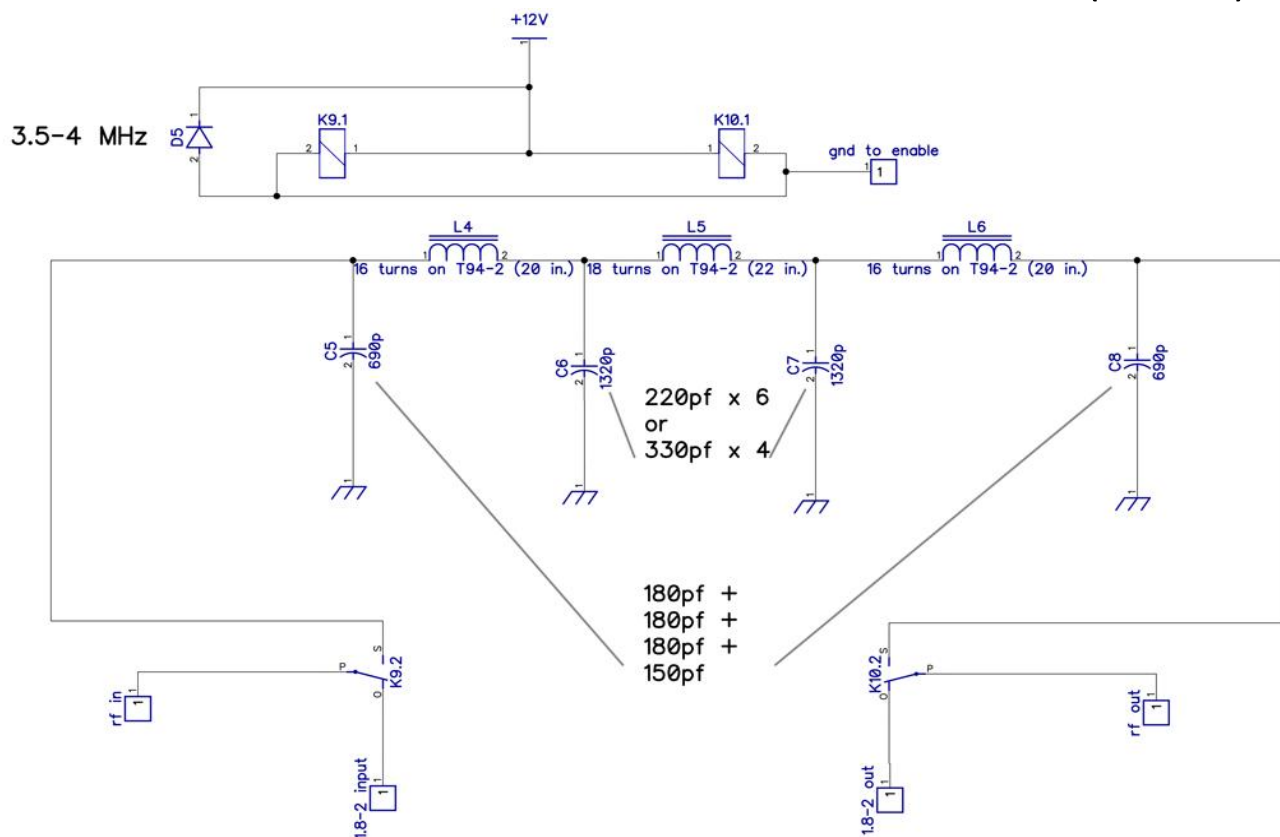
A full color assembly guide for this kit is located at <http://www.w6pql.com/images/hf/rev6%20info.pdf>

2 KW Low Pass Filter for 160-6 Meters (rev 6)

1.8-2 MHz

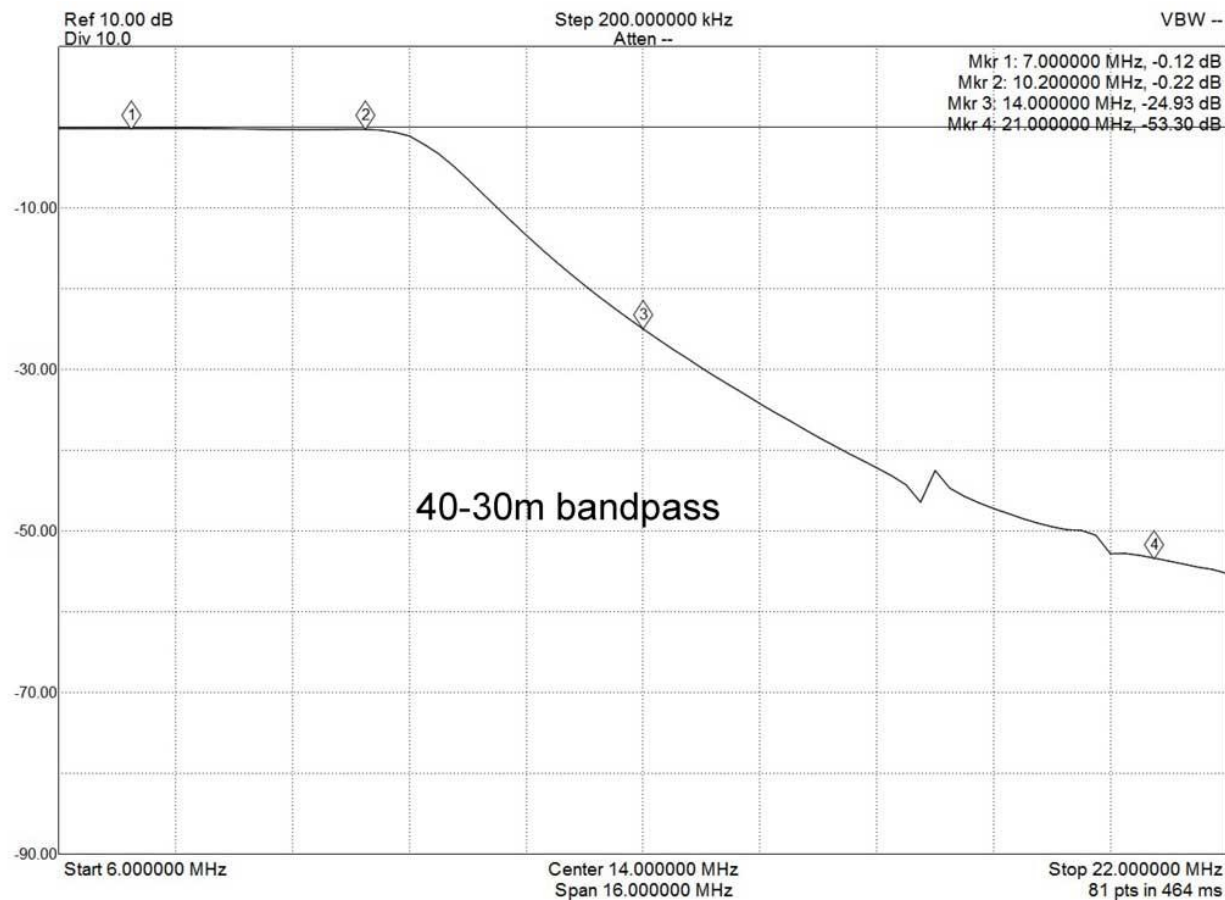
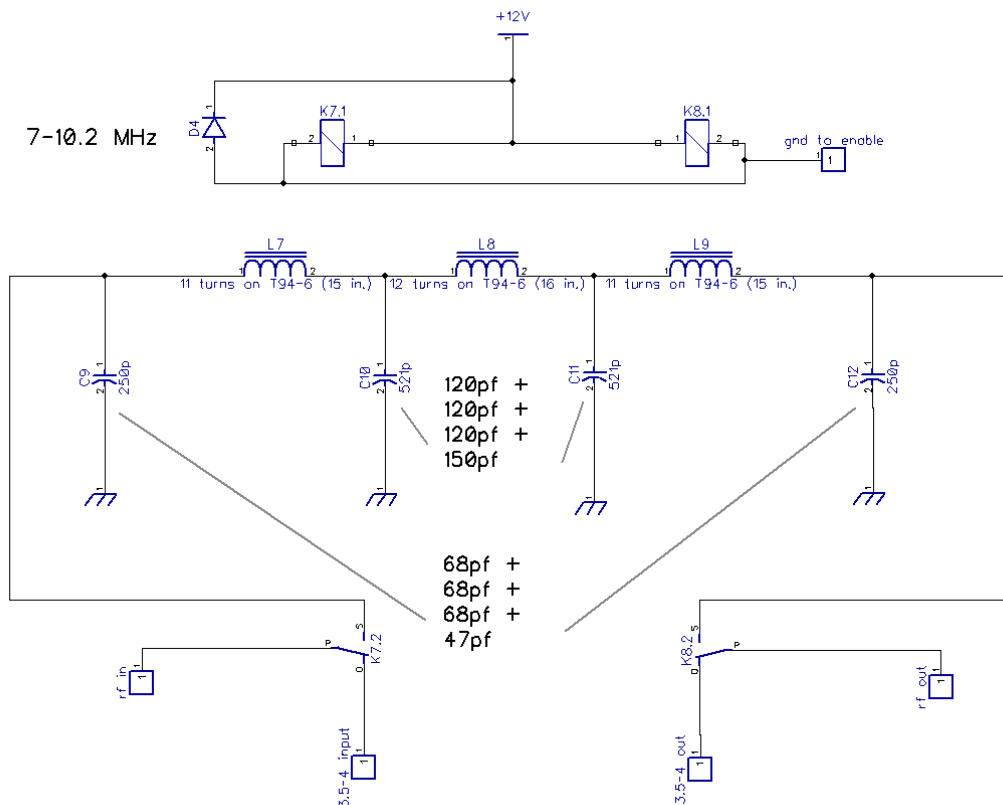


2 KW Low Pass Filter for 160-6 Meters (rev 6)



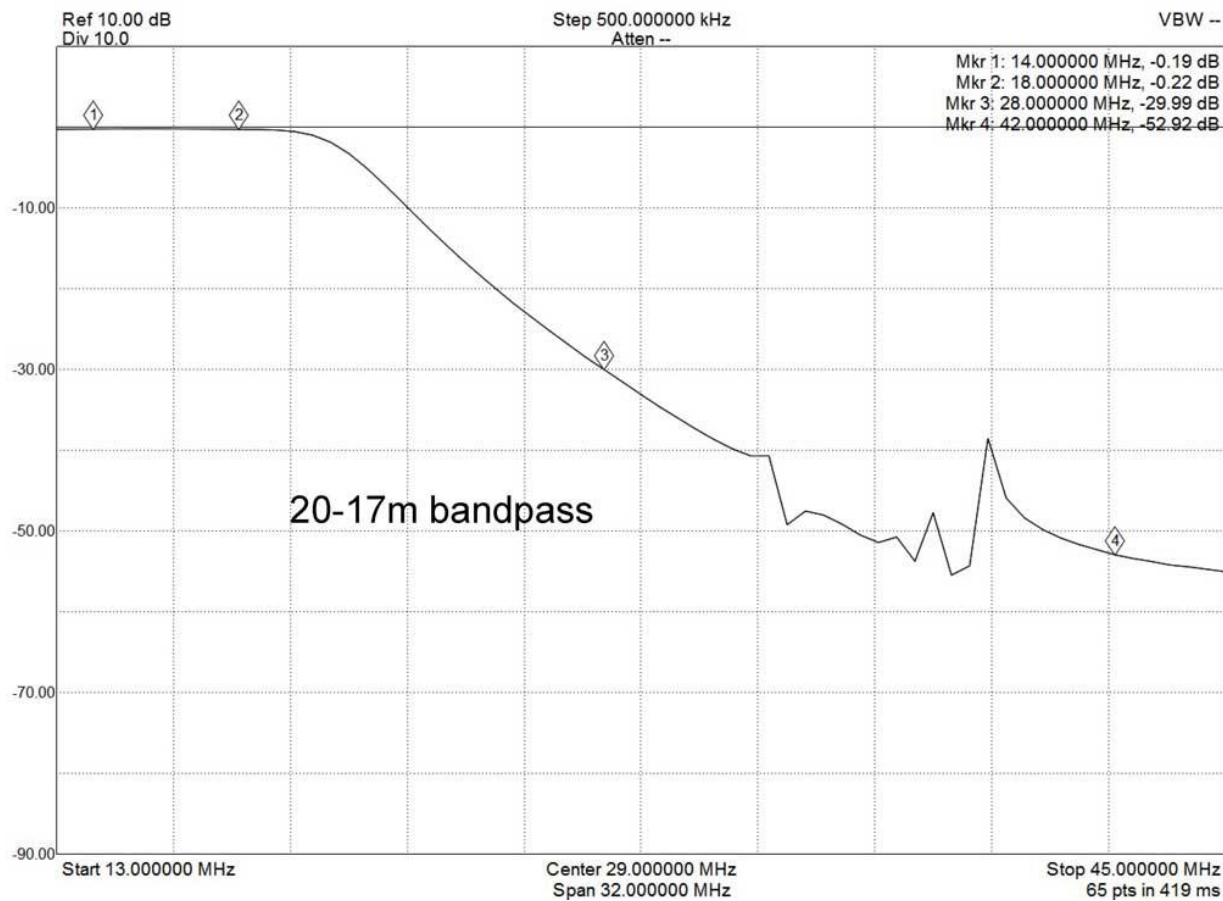
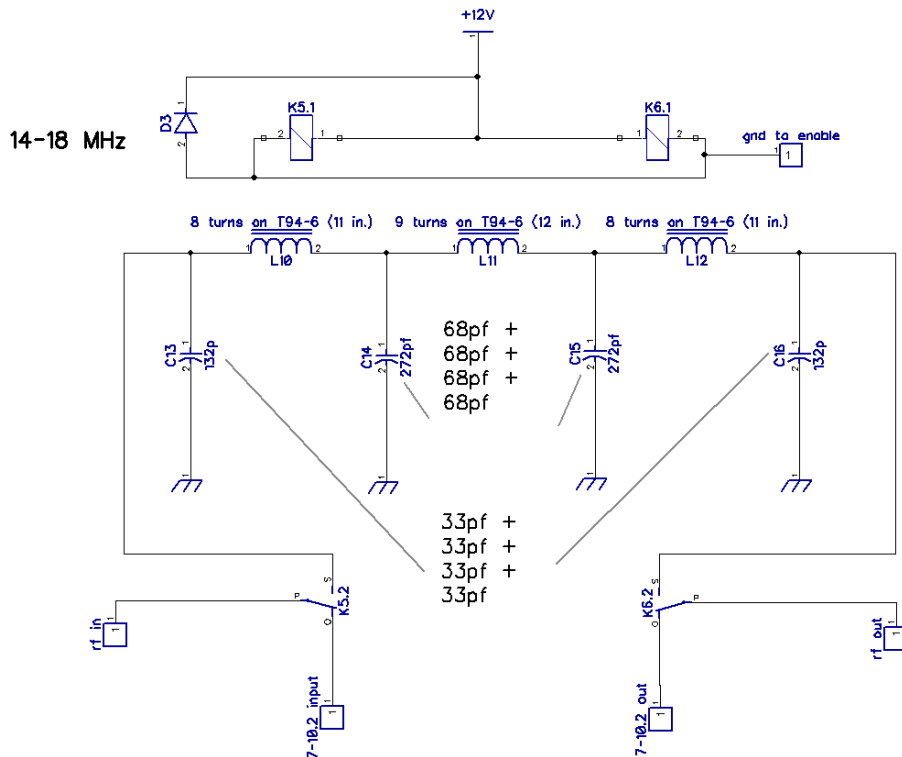
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2 KW Low Pass Filter for 160-6 Meters (rev 6)

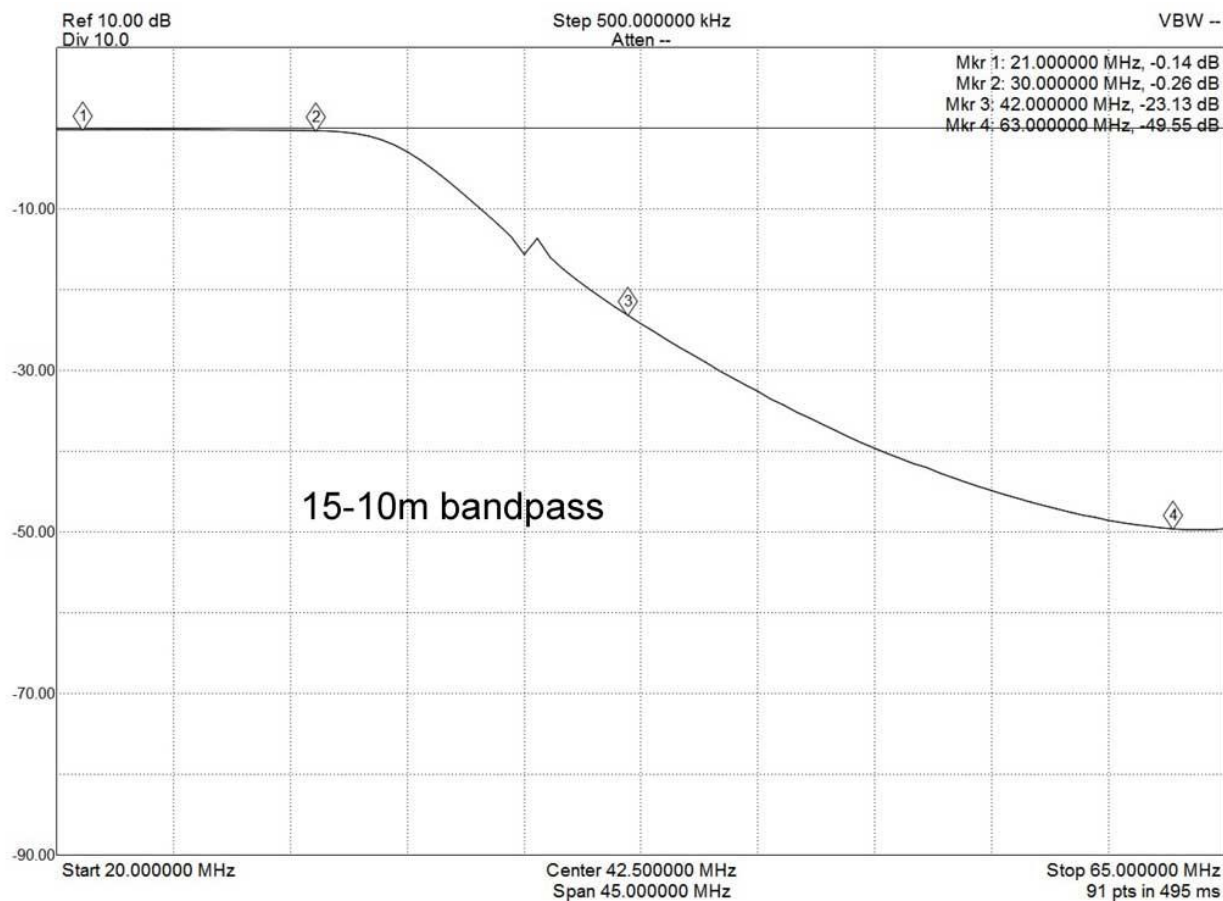
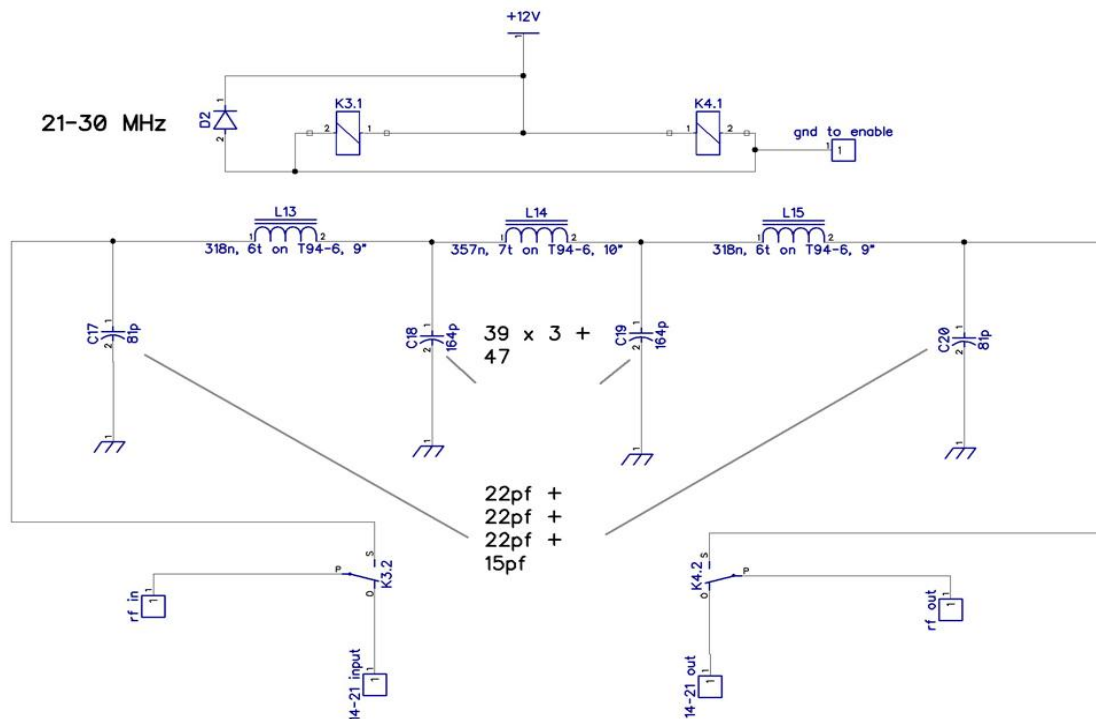


A full color assembly guide for this kit is located at <http://www.w6pql.com/images/hf/rev6%20info.pdf>

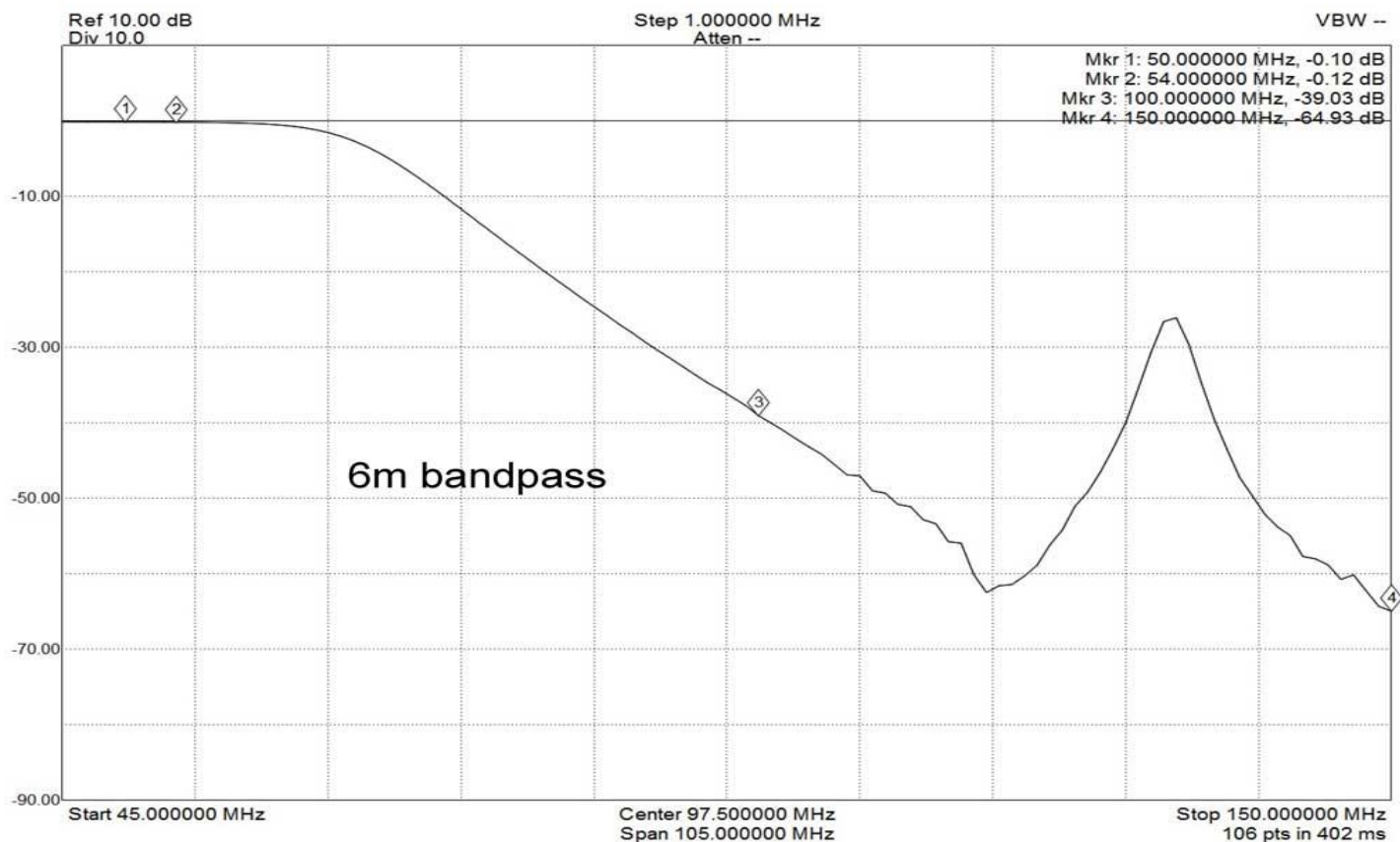
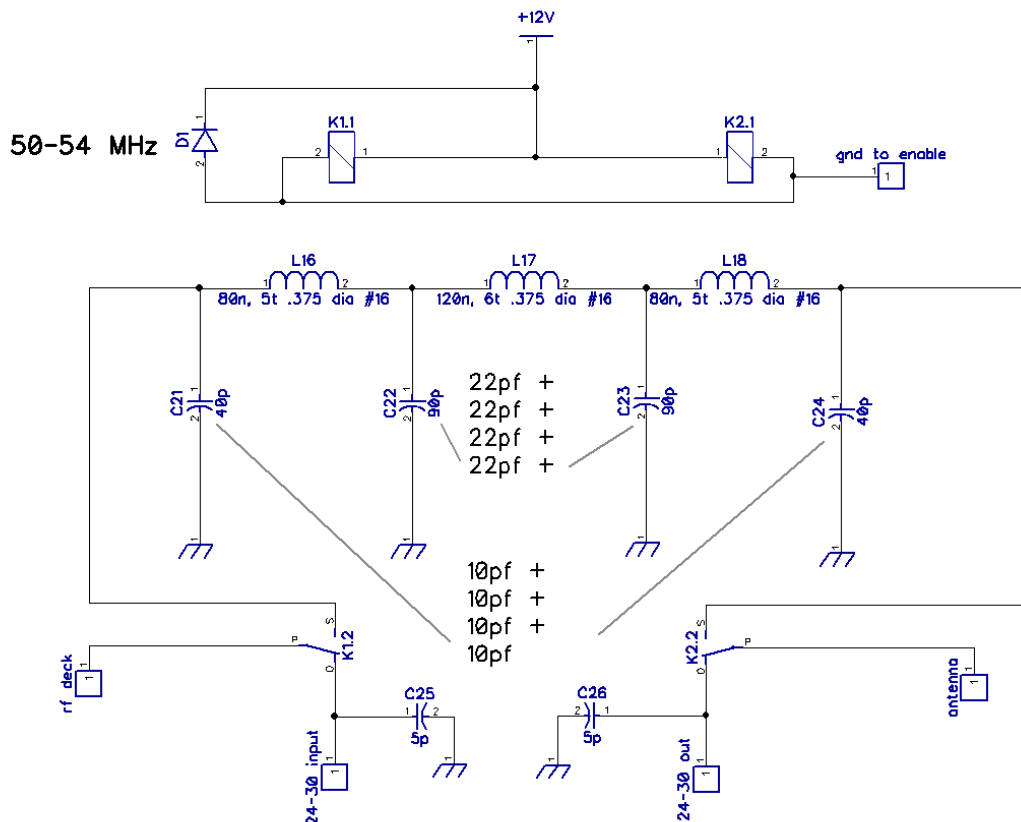
2 KW Low Pass Filter for 160-6 Meters (rev 6)



2 KW Low Pass Filter for 160-6 Meters (rev 6)



2 KW Low Pass Filter for 160-6 Meters (rev 6)

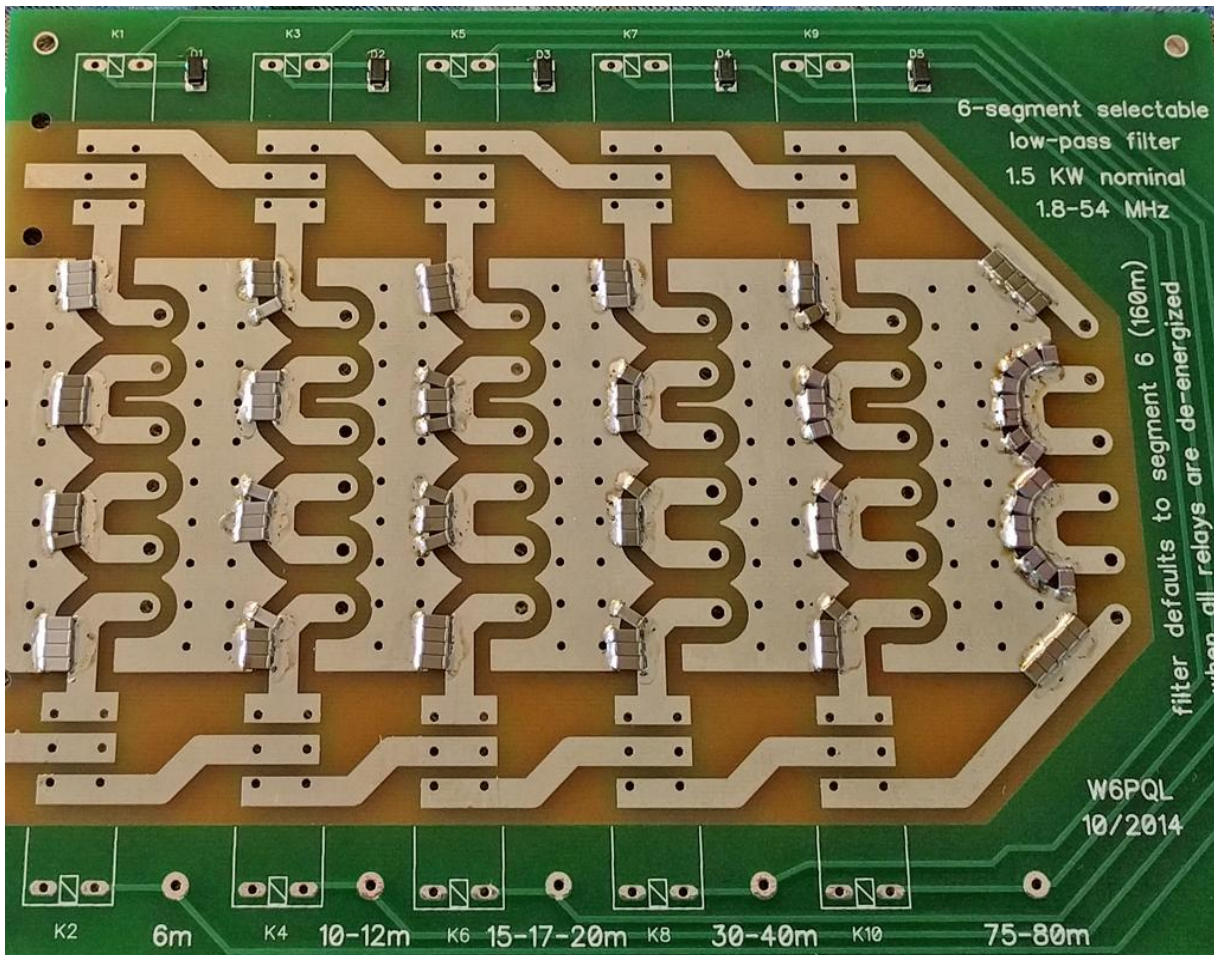


A full color assembly guide for this kit is located at <http://www.w6pql.com/images/hf/rev6%20info.pdf>

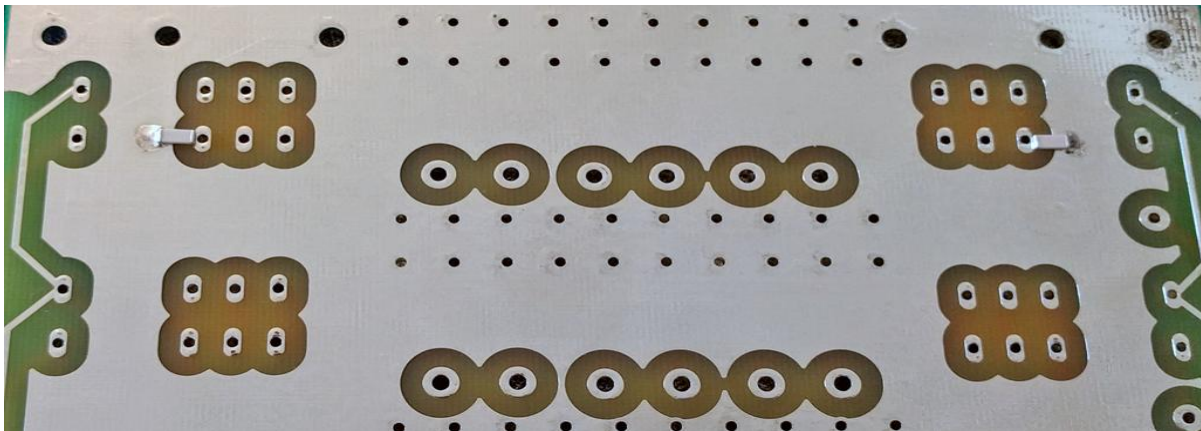
2 KW Low Pass Filter for 160-6 Meters (rev 6)

Assembly Guide

The first step is to install all the smaller components (diodes and capacitors) as seen in this photo (this avoids soldering iron damage to the plastic relay covers during assembly):



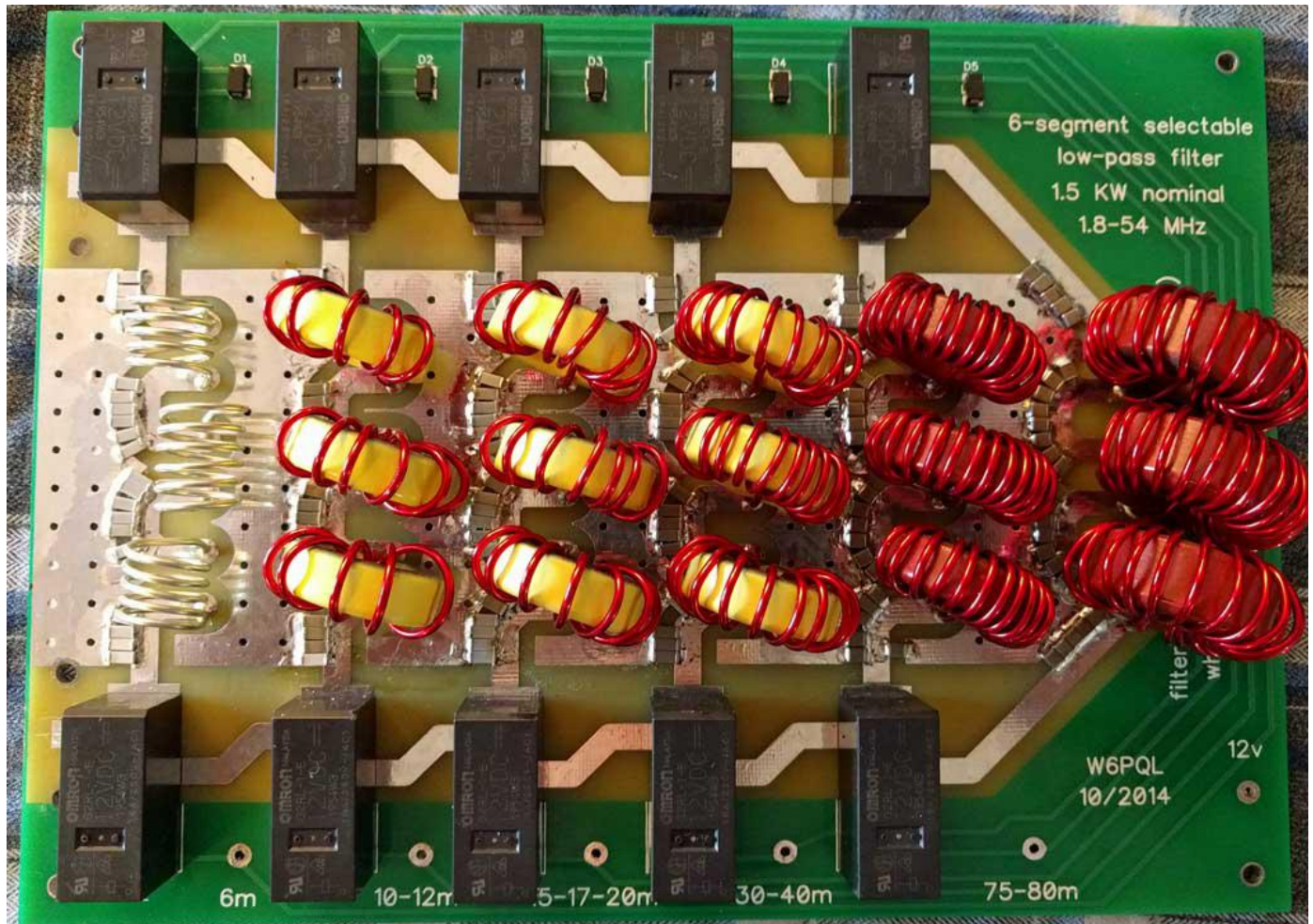
On the back side of the PCB nearest the 6m section, the 5pf capacitors are installed as shown. Solder only the ground plane side of the capacitors (for now) until the relays are installed.



A full color assembly guide for this kit is located at <http://www.w6pql.com/images/hf/rev6%20info.pdf>

2 KW Low Pass Filter for 160-6 Meters (rev 6)

Finally, install the relays and inductors.



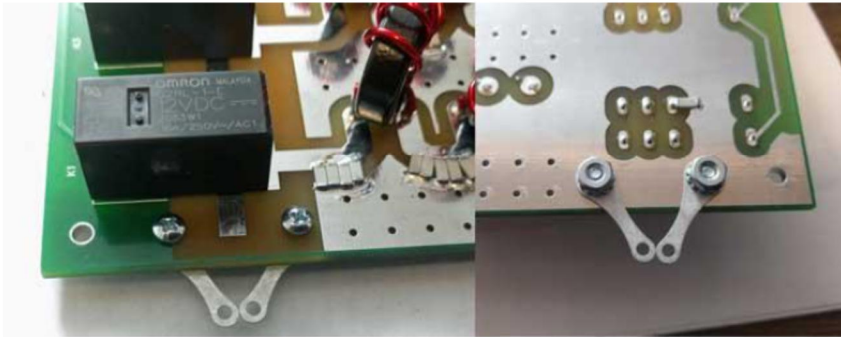
Alignment of the filter is best accomplished by terminating the output, and measuring the return loss (swr) on the input side as each filter segment is selected. Return loss should be $> 20\text{db}$ (1.2 to 1 or less) for each band (see the return loss charts at http://www.w6pql.com/a_1.5kw_lpf_for_160-6m.htm for typical performance). If alignment is required, the individual inductors can be tuned by spreading apart or compressing together the turns. The toroid inductors will behave the same way as the air inductors when tuned...the only real difference between the two is the dielectric material (air or metal compounds).

A scalar analyzer is the preferred tool for testing; if one is unavailable to you, an SWR bridge can be used, though this latter method will be much more time consuming.

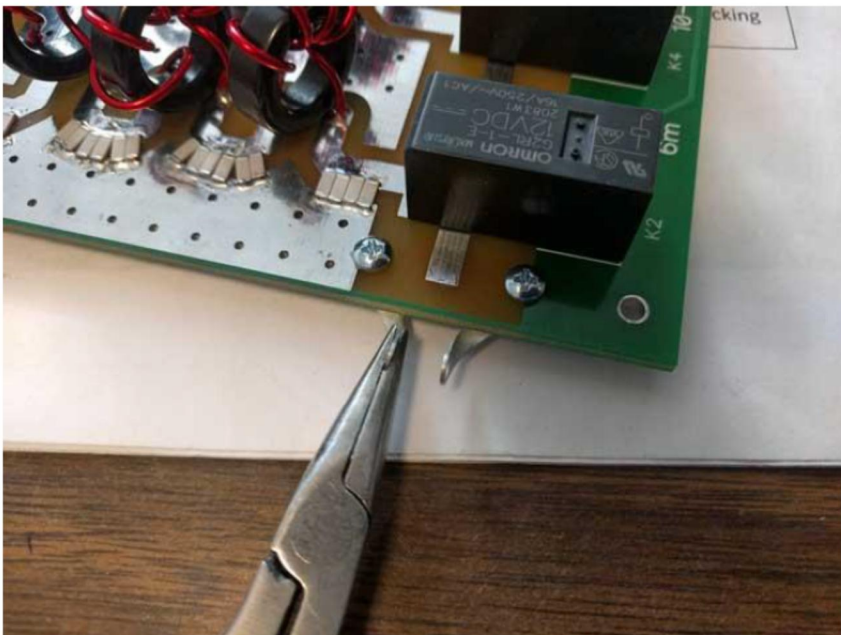
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2 KW Low Pass Filter for 160-6 Meters (rev 6)

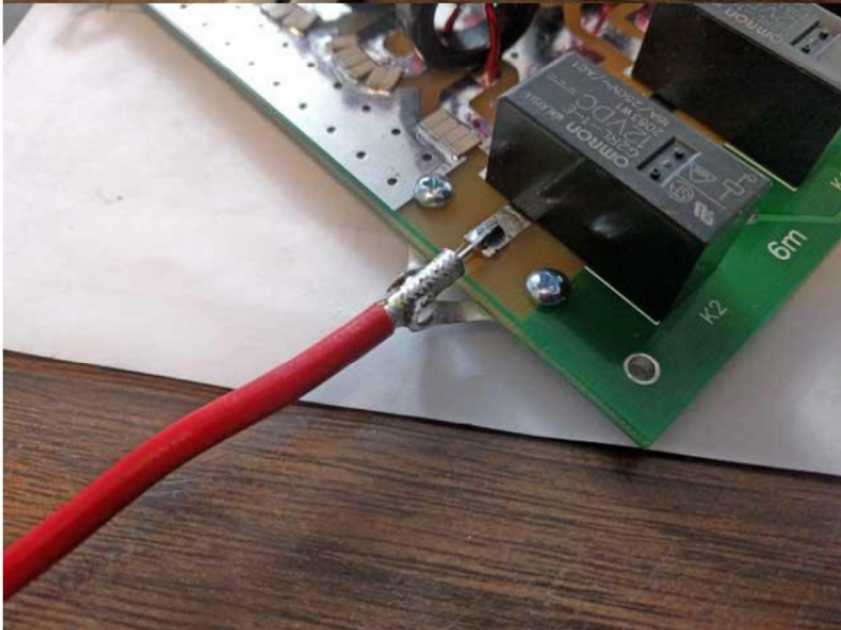
Coax fastener installation instructions



Secure two solder lugs as shown here using the 4-40 machine screws provided; leftmost photo is top side, rightmost photo shows the two locking nuts on the other side securing the lugs.



Using a pair of needle-nose pliers, bend the ends of the lugs vertical as shown. With the lugs formed in this way, there will be considerable strength in both the vertical and horizontal planes.



Shown here is RG402 coax, though you can use any coax (such as RG142) capable of handling the power.

Prepare your coax by removing 20mm insulation covering the outer conductor. Next, remove 10mm insulation covering the center conductor. With the center conductor laying on top of the board and soldered to the board trace, taking care not to move the coax, position the lugs against the sides of the outer conductor and solder them to the outer. Repeat this procedure for the other RF connection.

2 KW Low Pass Filter for 160-6 Meters (rev 6)

Bill of Materials

# 16 tinned wire, bare 5 turns	2	.375 ID
# 16 tinned wire, bare 6 turns	1	.375 ID
#16 magnet wire, 200C, 9"	2	6 turns
#16 magnet wire, 200C, 10"	1	7 turns
#16 magnet wire, 200C, 11"	2	8 turns
#16 magnet wire, 200C, 12"	1	9 turns
#16 magnet wire, 200C, 15"	2	11 turns
#16 magnet wire, 200C, 16"	1	12 turns
#16 magnet wire, 200C, 20"	2	16 turns
#16 magnet wire, 200C, 22"	1	18 turns
#16 magnet wire, 200C, 29"	2	18 turns
#16 magnet wire, 200C, 30"	1	19 turns
2kv ceramic		
330pf	24	
220pf	10	
180pf	6	
150pf	4	
120pf	6	
3kv ceramic		
68pf	14	
47pf	4	
39pf	6	
33pf	8	
22pf	14	
15pf	2	
10pf	8	
5pf	2	
G2RL-1-E-12V Relay	10	
GF1M Rectifier General Purpose	5	
#6 long solder lug	4	
4-40 k/l	4	
4-40 x .25	4	
PC Board	1	
T106-2 toroid core	3	
T94-2 toroid core	3	
T94-6 toroid core	9	

A full color assembly guide for this kit is located at <http://www.w6pql.com/images/hf/rev6%20info.pdf>