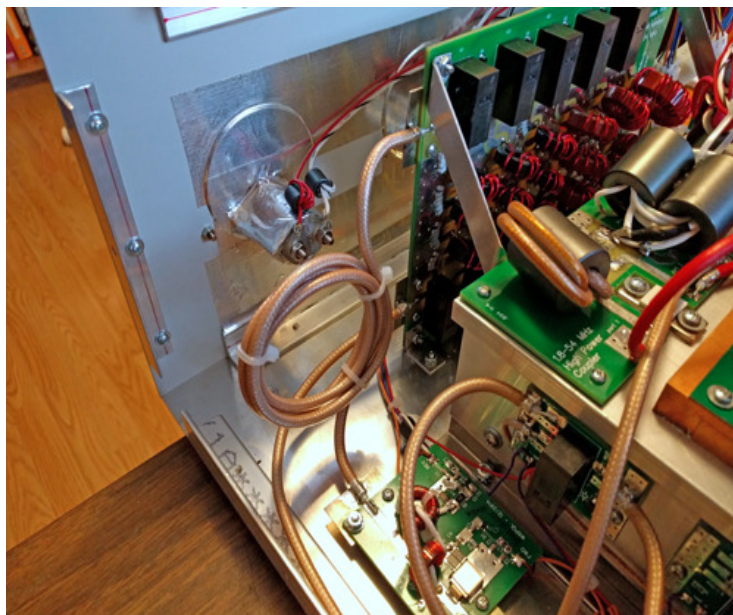


Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers

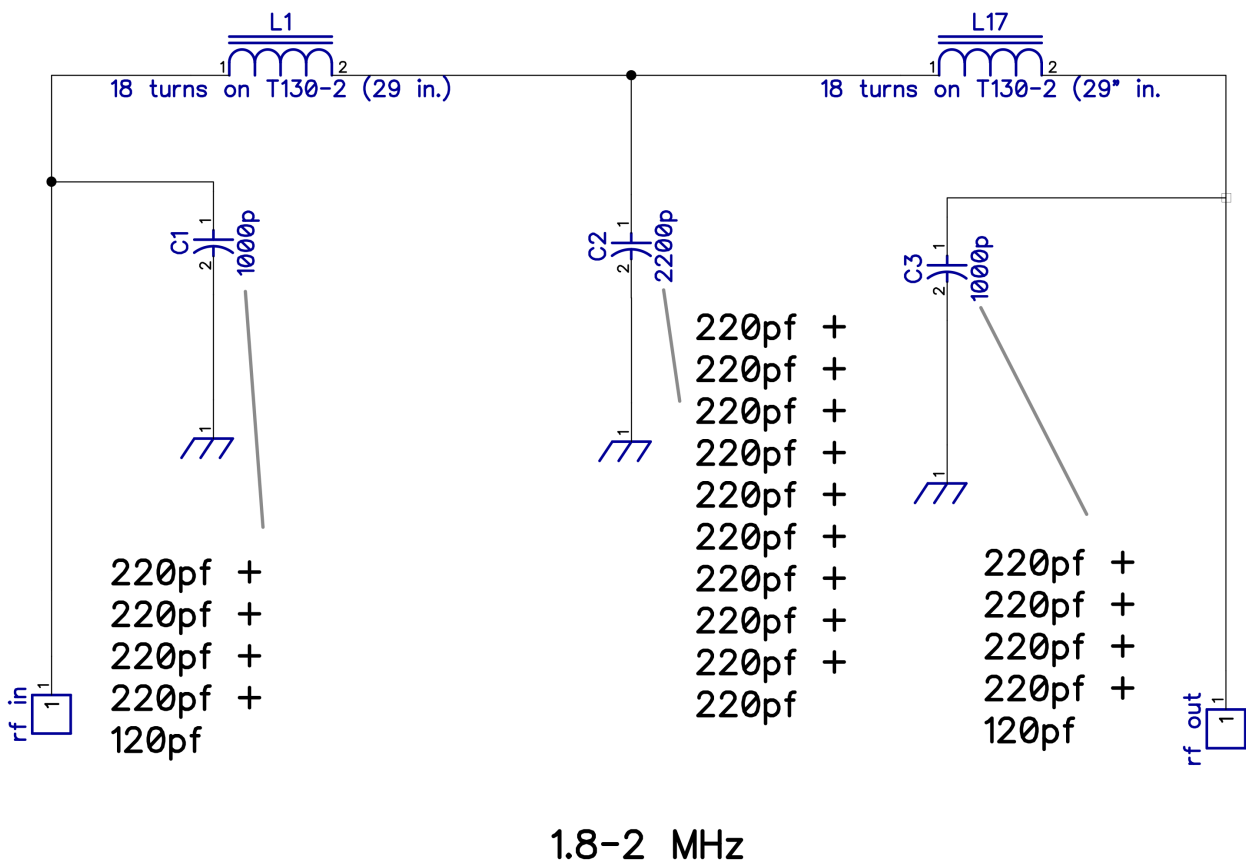
The filter sections on this board differ from the web article, and offer some improvement in performance, including raising the maximum power handling capacity. The most significant changes were to the 75m segment and to the 20m through 15m segment.

- Most capacitors used in the filter were changed to 2kv and 3kv SMD ceramic types, and paralleled for additional current capacity.
 - The 75m configuration was changed to a capacitive input type, replacing the previous inductive input type. This change was made to increase maximum output on this band due to the sensitivity of some LDMOS amplifiers to the phase angle of 3rd harmonic energy reflected back to the source from the filter in this segment.
 - The 14MHz through 21MHz segment, and the 6m segment were changed to a 7-pole capacitive input type for additional suppression and lower passband ripple. The 6 meter segment was also changed to a 7-pole type.
 - 5pf 3kv chip capacitors (C17 and C18) were added to a portion of the circuit to increase suppression of the 3rd harmonic in the 50MHz filter segment.
1. The first fix was to re-configure the low pass filter segments to favor the offending band segment. For example:
 - a. 160 and 75m segments required a configuration of C-L-C-L-C
 - b. 60-30m required L-C-L-C-L (no change)
 - c. 20-15m needed C-L-C-L-C-L-C
 - d. 12-10m needed L-C-L-C-L (no change)
 - e. 6m needed C-L-C-L-C-L-C
 2. This left only 15m requiring some additional attention, and this second change also improved power levels and efficiency on 20m and 12m
 - a. The fix was to stand the filter off from the power combiner with 42 inches of RG142, a technique used successfully on VHF amplifiers, but trickier to implement on a broadband HF amplifier like this one. Combiner to first sensor is the first 10" of this 42, then from sensor to filter is another 32". This last 32" replaced the common mode choke previously used, and was installed in a small, neat coil. It should be noted the length of the two coax jumpers from the RF decks to the combiner were 7" each, though I did not experiment with them and don't know if this length is relevant. Either way, a change of 2 or 3 inches will not matter if the length of your jumpers will differ.
 - b. The length of this stand-off will be **different for single-pallet (1kw) amplifiers** (62 inches) because the length added by the combiner does not exist.

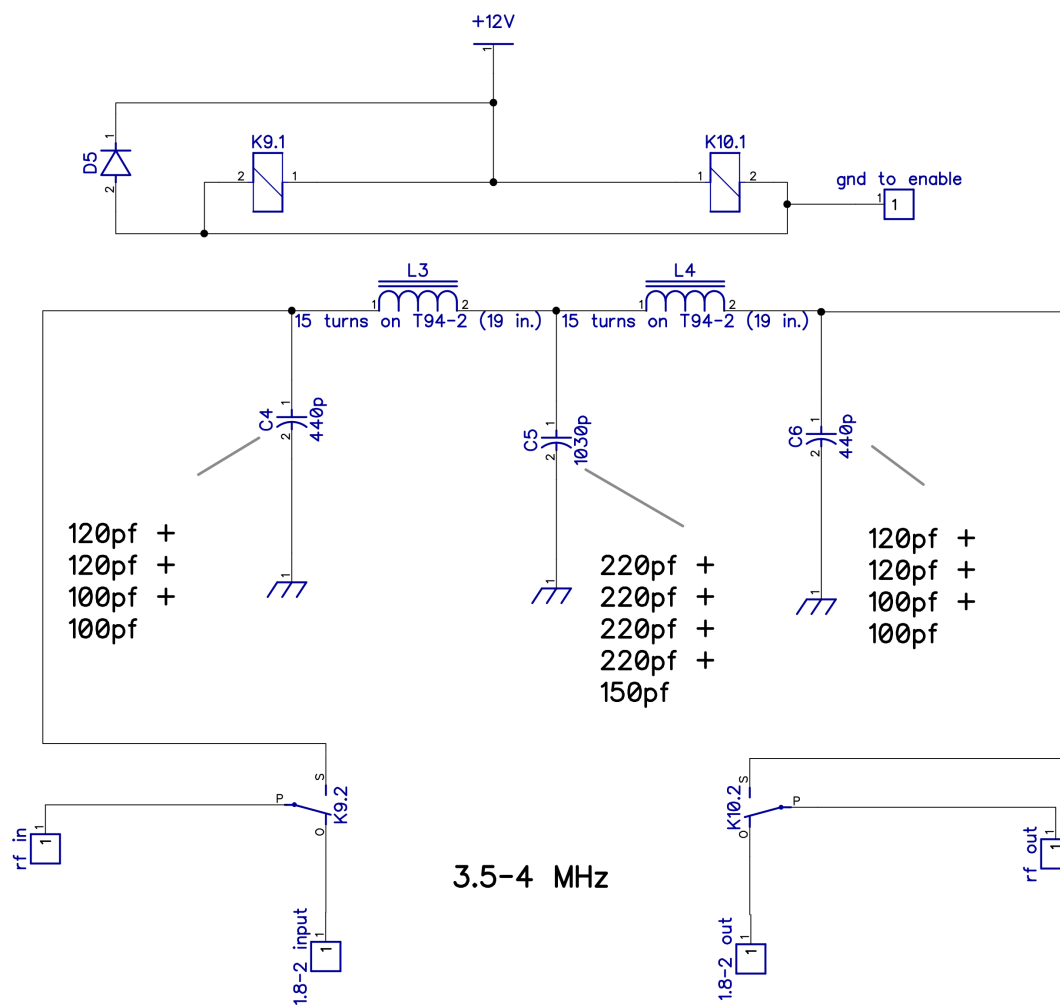


Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers

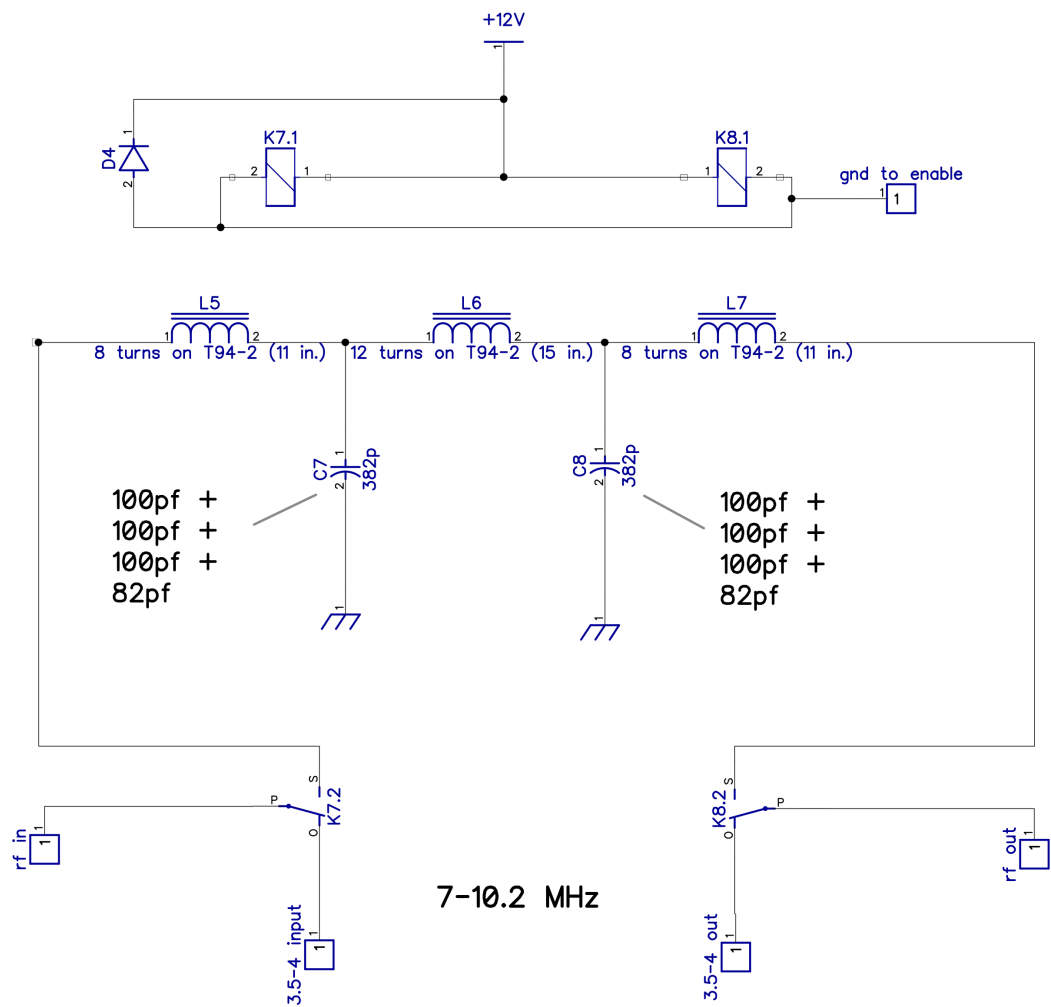
The following pages show details for appropriate low pass filter configurations (recommended for two-pallet LDMOS amplifiers capable of greater than 1.5kw):



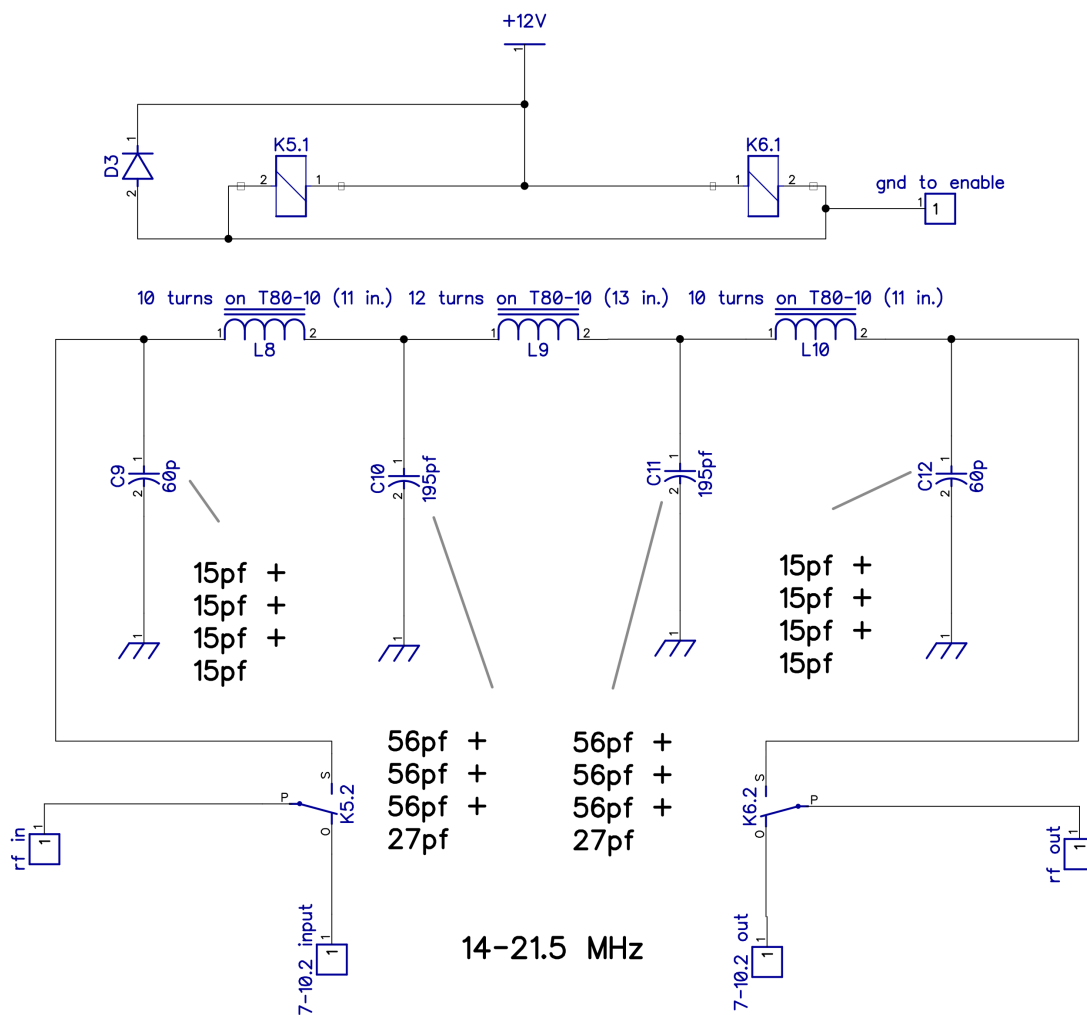
Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers



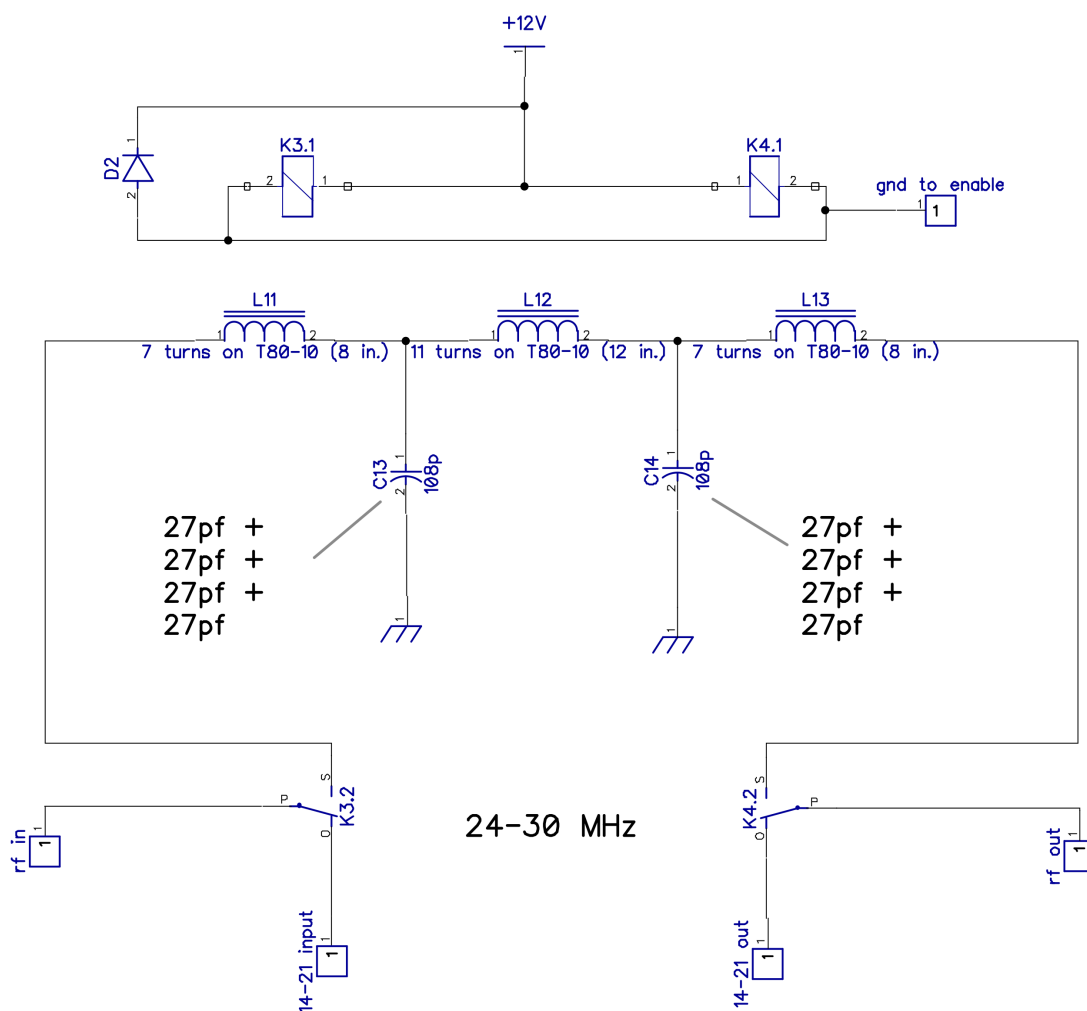
Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers



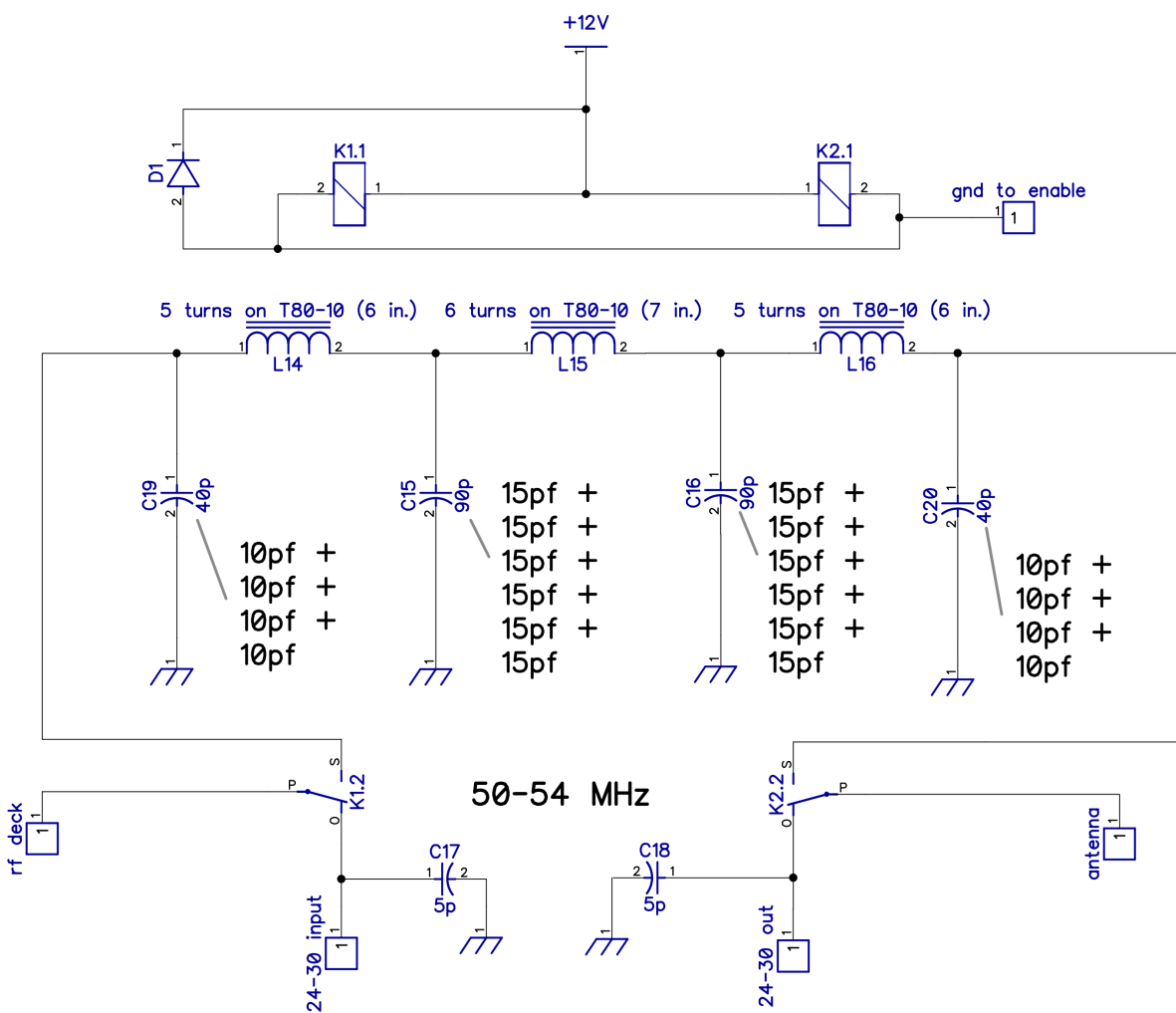
Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers



Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers



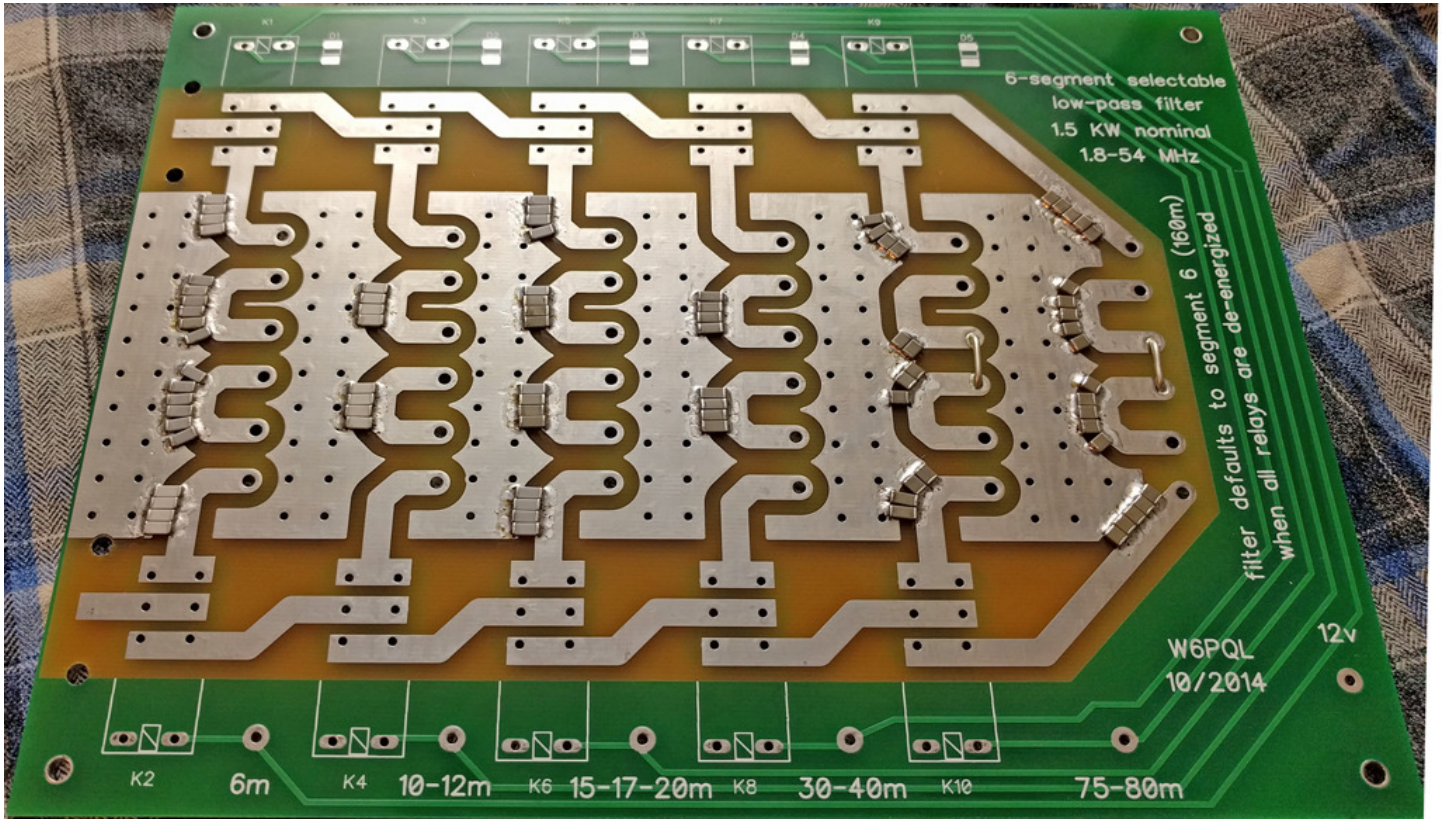
Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers



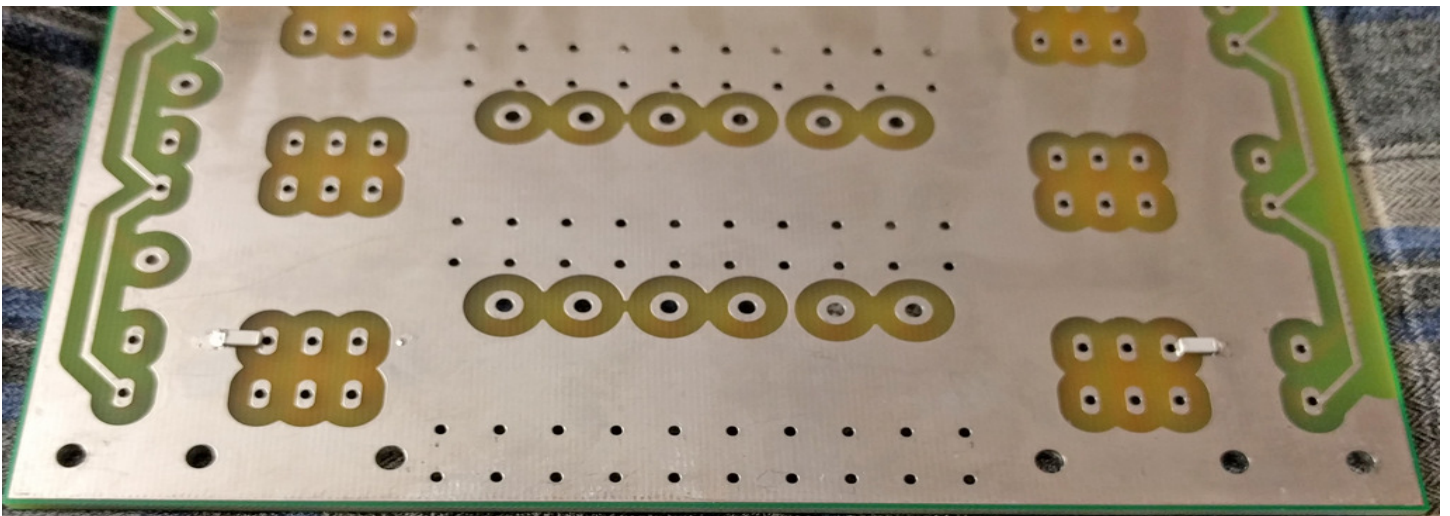
Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers

Assembly instructions for this filter revision (5) are basically the same as shown on the following web page:
<http://www.w6pql.com/hf/lpf-assembly.htm>; The pages below show the changes to be made:

These next two photos show where the capacitors are placed. Note the two jumpers in the 160m and 75m sections.

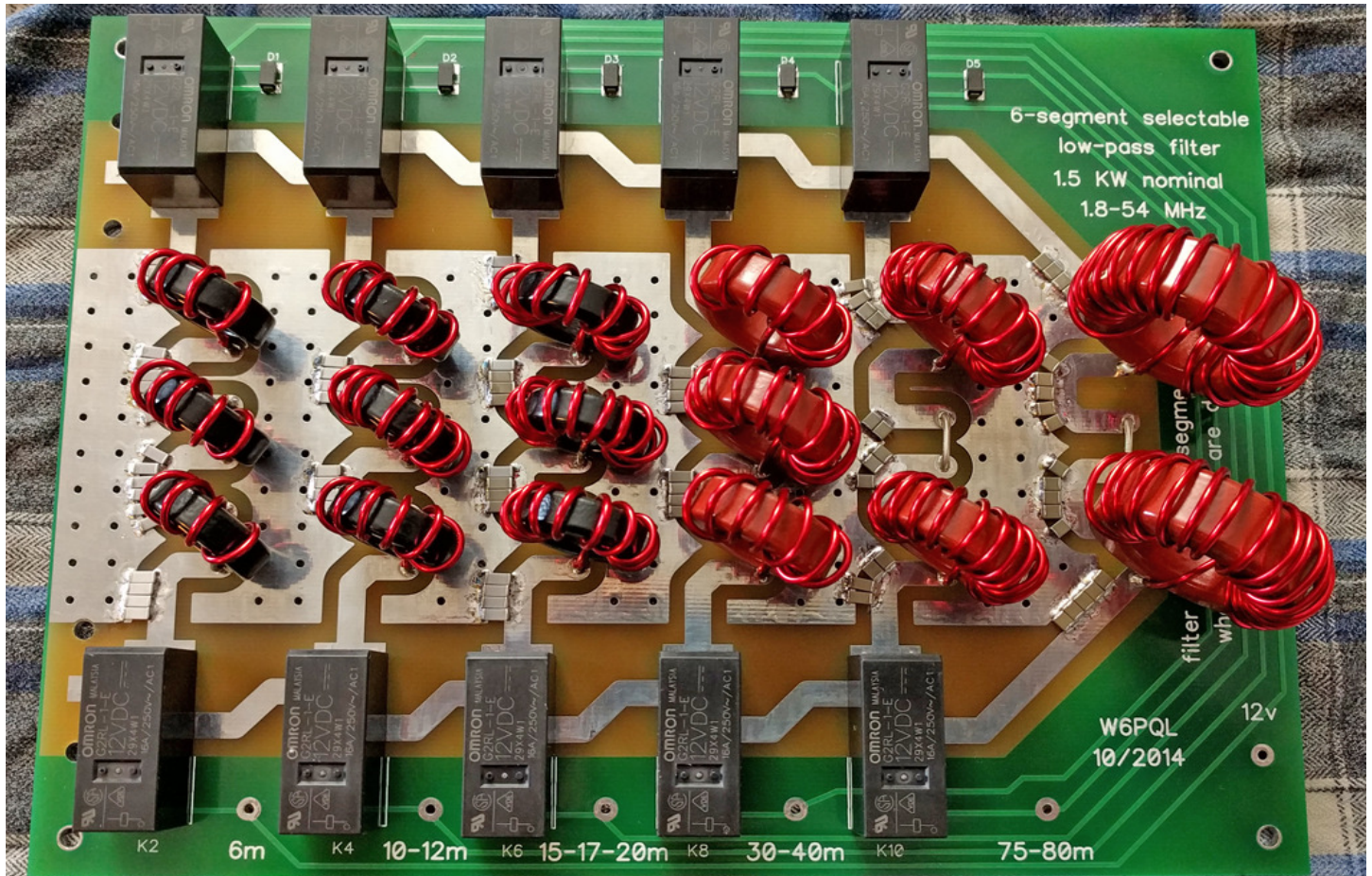


The two 5pf capacitors in the next photo are installed on the other side of the board next to the 6m segment. Until the relays are installed, only one side is soldered down to hold them in place (the grounded side).



Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers

Your completed filter board should look like the photo below



Low Pass Filter (rev 5) for single and 2-Pallet HF Amplifiers

Bill of Materials		
Capacitors	quantity	Value
	22	220pf 2kv
	1	150pf 2kv
	6	120pf 2kv
	10	100pf 3.15kv
	2	82pf 3.15kv
	6	56pf 3.15kv
	10	27pf 3.15kv
	20	15pf 3.15kv
	8	10pf 3.15kv
	2	5pf 3.15kv
Toroid Cores		
	2	T130-2
	5	T94-2
	9	T80-10
Diodes		
	5	GF1M
Relays		
	10	G2RL-1-E-12V
Magnet wire, #16, 200C		
	2	29 inches for L1, L17
	2	19 inches for L3, L4
	1	15 inches for L6
	1	13 inches for L9
	1	12 inches for L12
	4	11 inches for L5, L7, L8, L10
	2	8 inches for L11, L13
	1	7 inches for L15
	2	6 inches for L14, L16
Printed Circuit Board		
	1	
Coax fasteners		
	2	Includes two 4-40 x ¼ screws and locking nuts per fastener

Though the types and quantities of components differ from the original technical article, the assembly instructions at <http://www.w6pql.com/hf/lpf-assembly.htm> should be used as a guide