2m Low Pass Filter for High Power

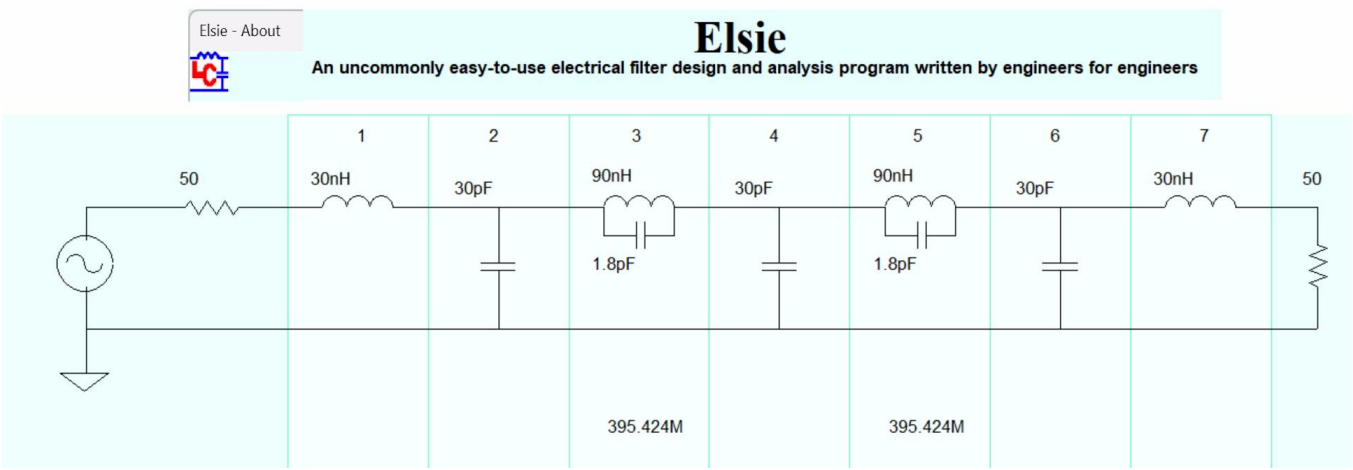
A number of W6PQL designs for Low Pass filters from 6m to 70cm have been popular with SSPA builders. . Low Pass Filter + Dual Directional Detector and the newer Low Pass Filter + Dual Directional Detector

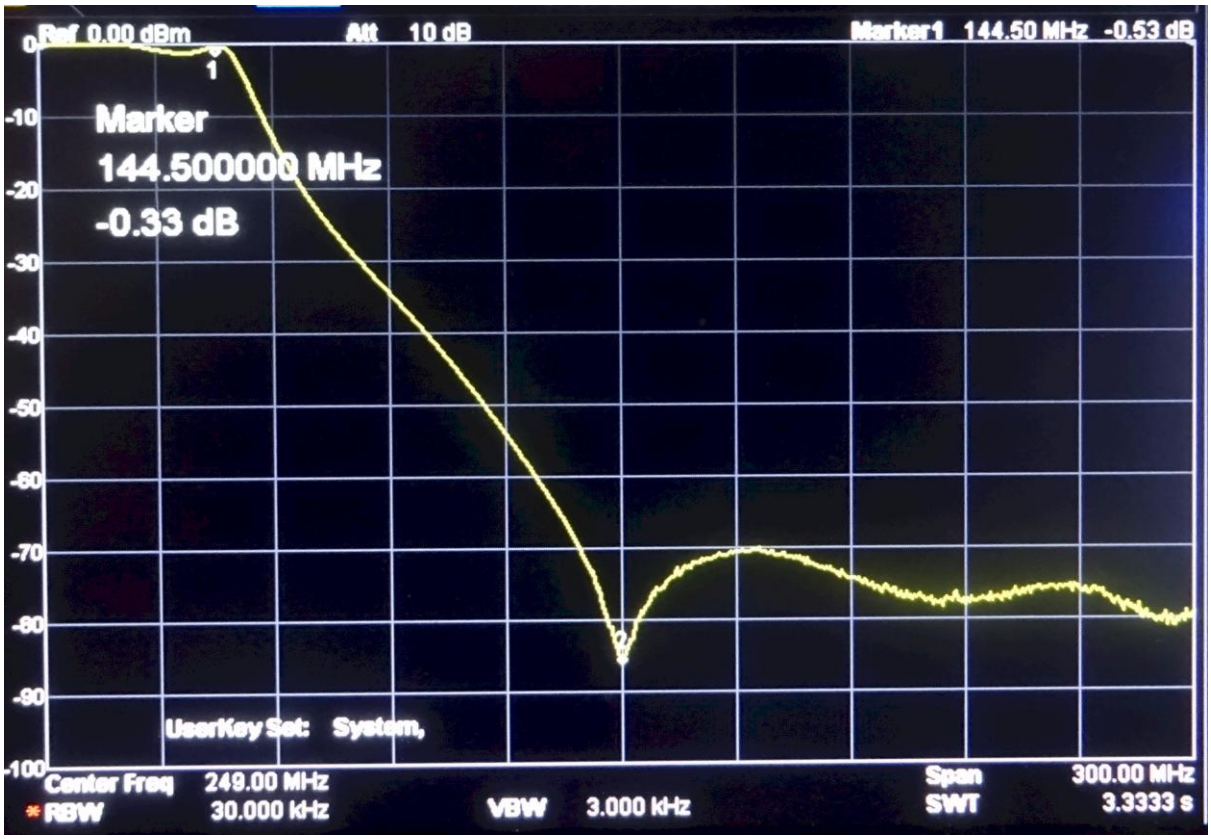
When the FR4 PCB with printed capacitors are used in higher power applications the results can be spectacular (yes the “Magic Smoke” may escape). Jim’s later offering include PTFE PCB in lieu of the FR4.Some of Jim’s examples use compressed mica capacitors. At higher power levels (400W at 6m) some of this type and its related multilayer mica SMD have flashed-over or otherwise failed.

High loss may occur with microstrip capacitors on FR4 board. When the microstrip capacitors were built on the shields, the capacitors overheated at 400+ W.

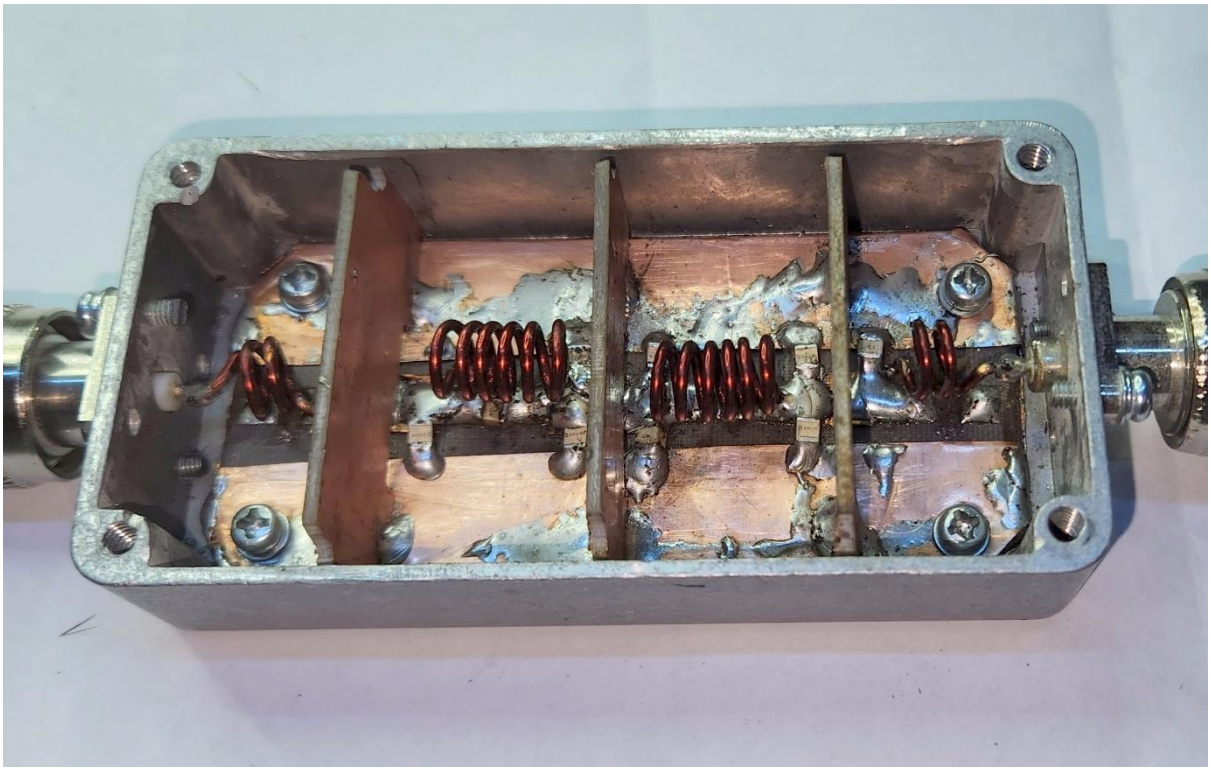
The design below is based on Jim W6PQL design but minimises PCB capacitance and the losses experienced with some builds. Several ATC type capacitors are used in parallel to distribute RF currents, reducing the stress on the capacitors.

Elsie design program was used to optimise the design for 2m. The two centre sections are parallel tuned. This notch at 400MHz increased the slope of the rejection curve above 288MHz.





The result is a low loss LPF with excellent attenuation at the 144MHz harmonic frequencies.



Thiis filter is built in a 1590B diecast aluminium enclosure. Double sided PTFE board from Larcan amplifier splitter combiner was used to support the components. Copper sheet was fixed either side of the component mounting strip. The copper was soldered to the ground plane side of the board and then folded over the edges of the board. Short pigtails pinned the top copper sheet to the ground plane at multiple points.

Shields of double sided FR4 were inserted between the sections after all other components were assembled.

Fine tuning was achieved by spreading / compressing the turns of the inductors.

N flange mounting N type connectors were fitted to input and output.

Warning: Don’t use microstrip capacitors on the main PCB or shields in high power applications. FR4 board will be lossy and possibly fail due to the heating.