



## EU 40 Meter K2 Narrow Bandpass Filter

This note covers narrowing the K2's 40M bandpass filter to cover the narrower 40M band and reject strong out of band broadcast interference.

Peter Zenker wrote:

>As an experiment I changed C6, the 5pF coupling condensor against a 7,02 MHz ceramic Filter from Murata...

We looked at the specs on the Murata filter, and I believe that we could modify the existing 40 m BPF in the K2 to do almost as well. This may be preferable to obtaining the ceramic filter, and it would require only capacitor changes.

For example, you could use the following values:

C4 and C8 = 1800 pF

C5 and C7 = 120 pF

C6 = 2 pF

L1 and L2 peaked at 7.050 MHz (about 4.4 uH)

Our modeling tool shows the following characteristics:

Insertion loss: 5 dB

Bandwidth: -3 dB: 180 KHz

-20 dB: 700 KHz

-40 dB: 1.5 MHz (approx)

The Murata filter is better at 20 and 40 dB:

Insertion loss: 6 dB

Bandwidth, -3 dB: 150 KHz

-20 dB: 400 KHz (est. from graph)

-40 dB: 600 KHz (est. from graph)

But this new L-C filter has better ultimate rejection--over 60 dB at 5 MHz, for example. The ceramic filter levels out at around 50 dB.



However, both of these filters are \*much\* narrower than the original K2 BPF. So, our guess is that you might not notice any difference between the new L-C configuration and the Murata ceramic filter.

By the way, if you used hi-Q toroids rather than the 4.7uH slug-tuned inductors, you could improve performance of the filter quite a bit: loss would drop to about 2 or 3 dB, and it could be made even narrower. But you'd then have to hand-select fixed capacitors to adjust the filter or use very large trim caps.