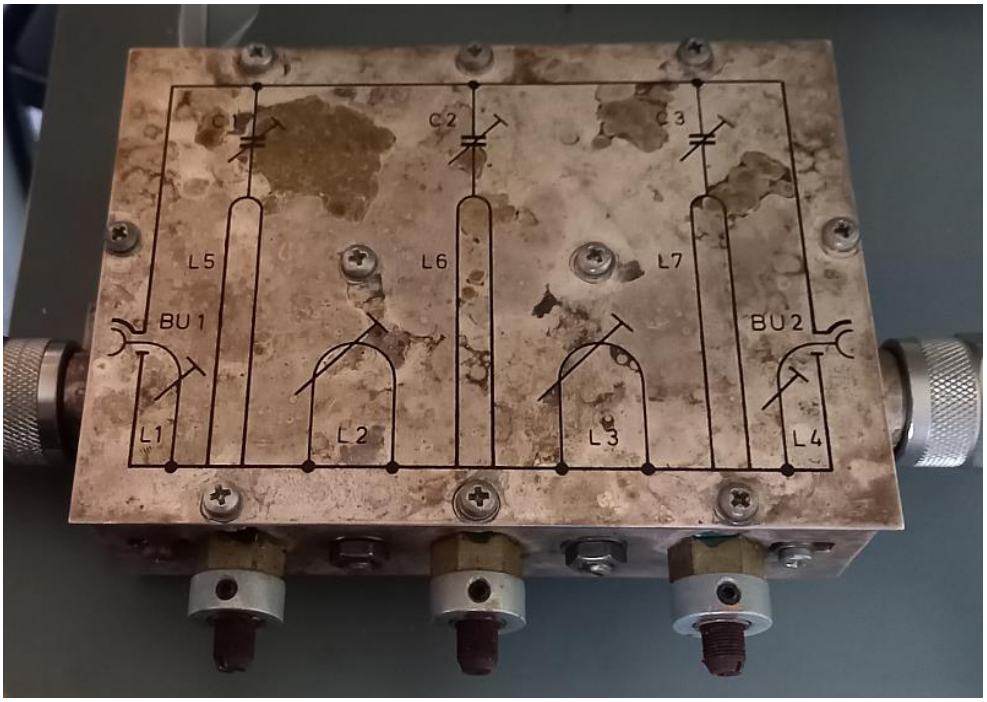
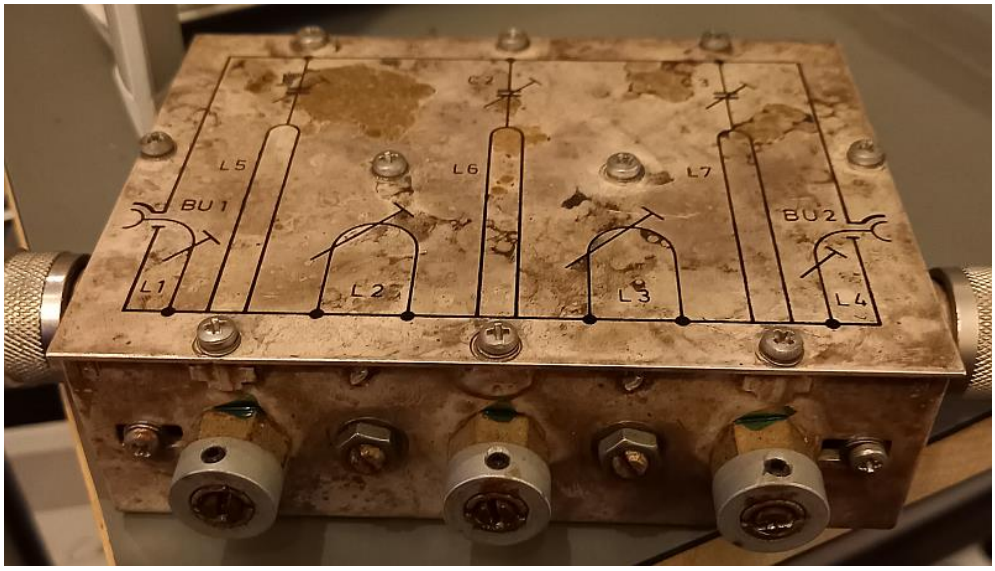
3 pole UHF bandpass filter R&S FD 006 retuned to 435MHz

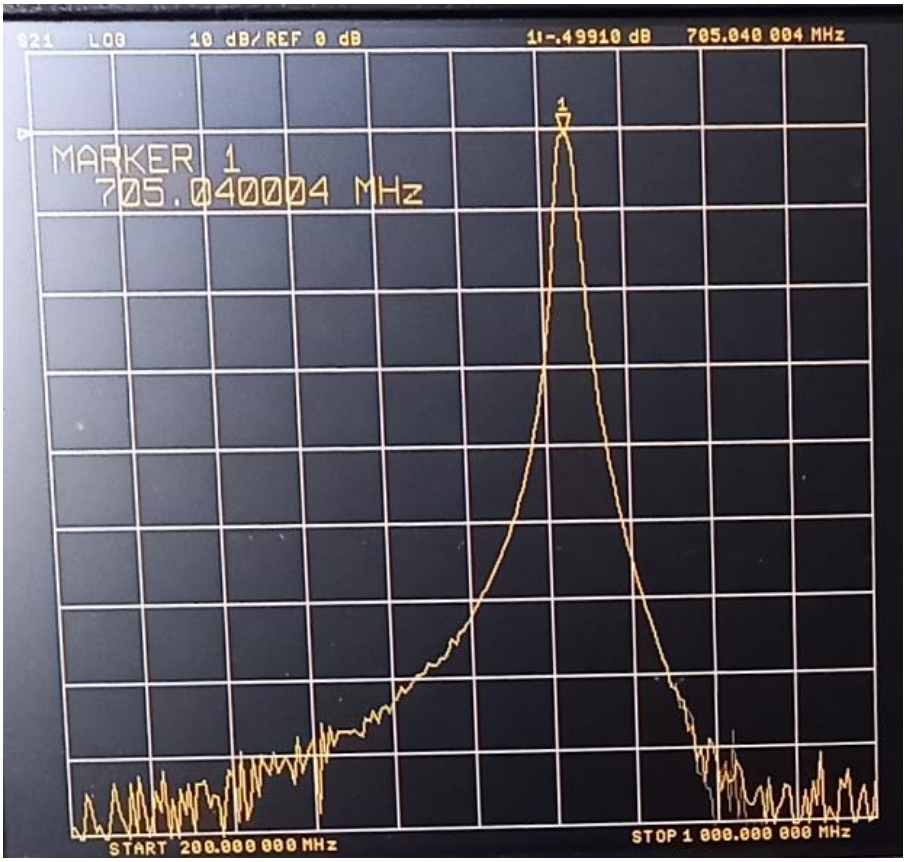
Matthias, DD1US, November 6th 2020

Recently I acquired a UHF bandpass filter from R&S which was apparently originally used for TV broadcast purposes. This filter from R&S has the following identifiers on a label: FD 006 and 497.6919.03 and FNr. 874406/029. The filter is made from silver plated brass with N-connectors. I had bought the filter with the intention to retune it to the 70cm ham radio band. Here are some pictures of the filter:

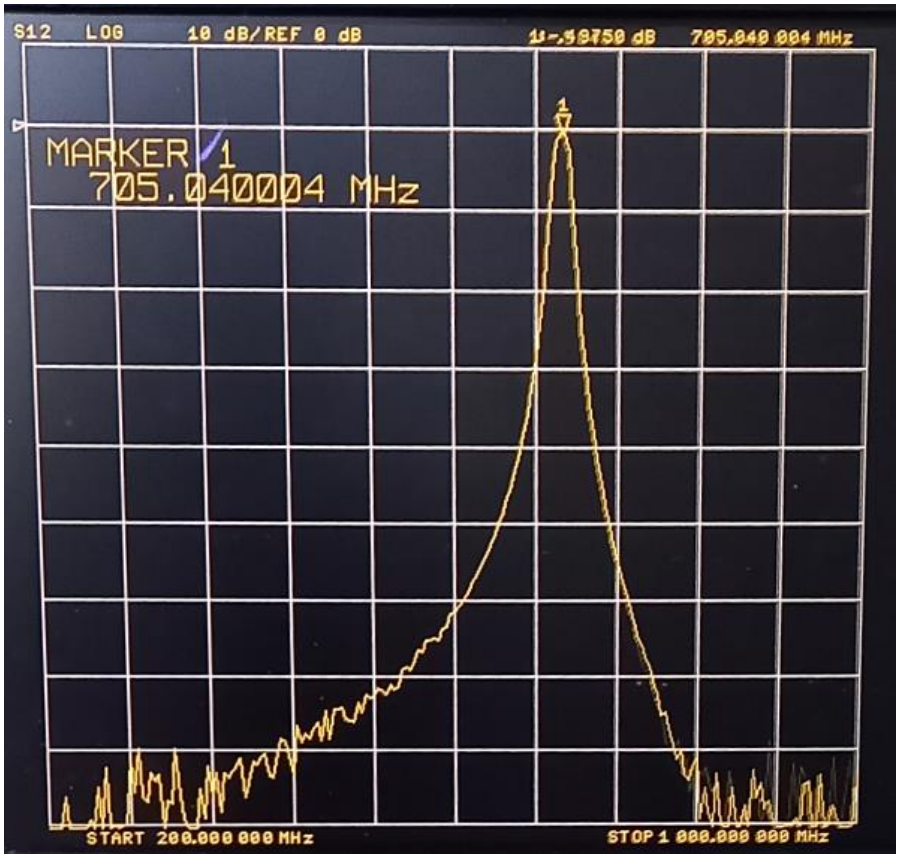




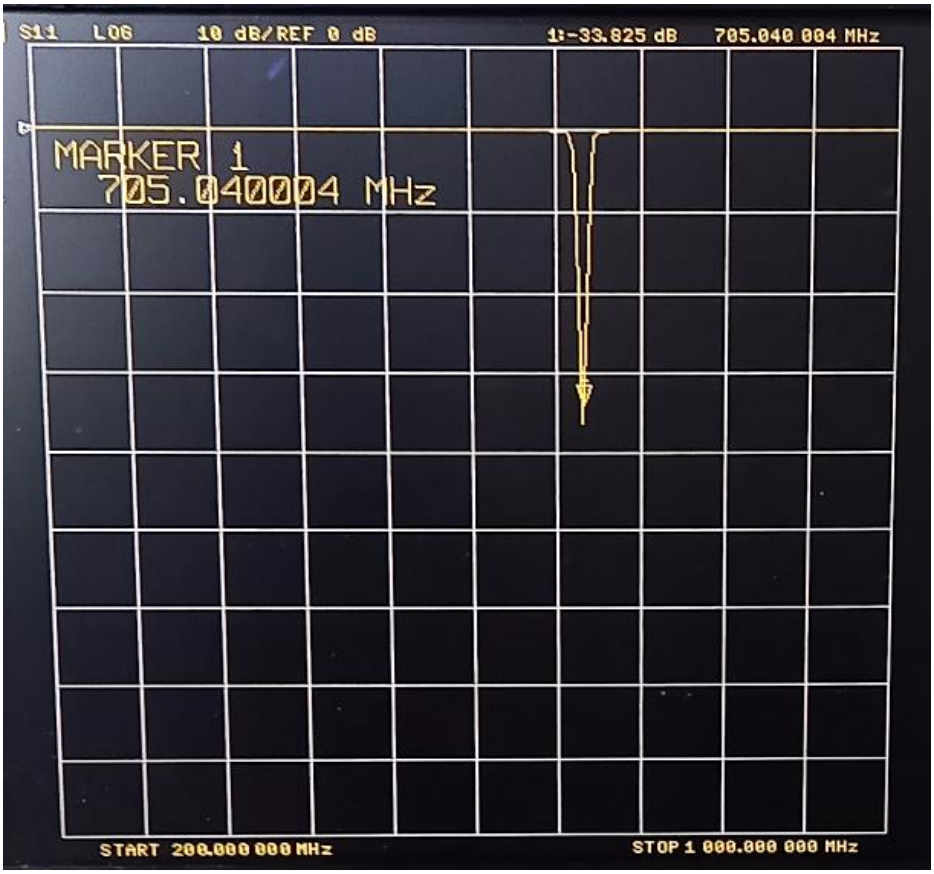
First, I measured the filter as I had received it:



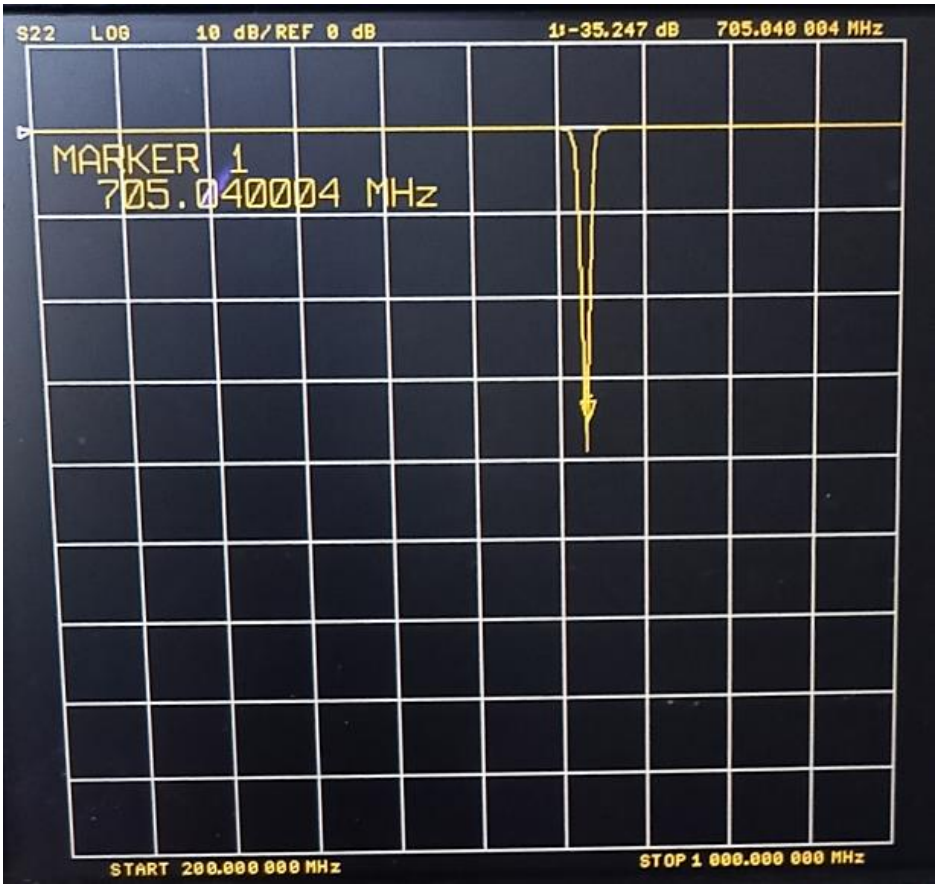
S21 log mag: insertion loss



S12 log mag: isolation

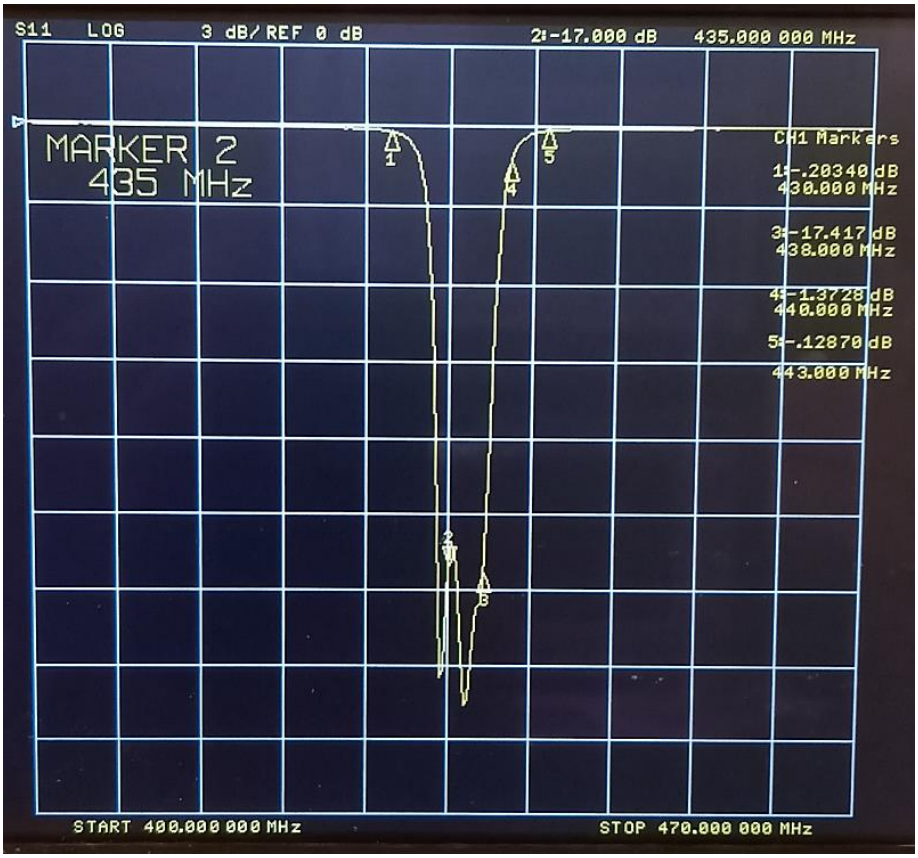


S11 log mag: return loss

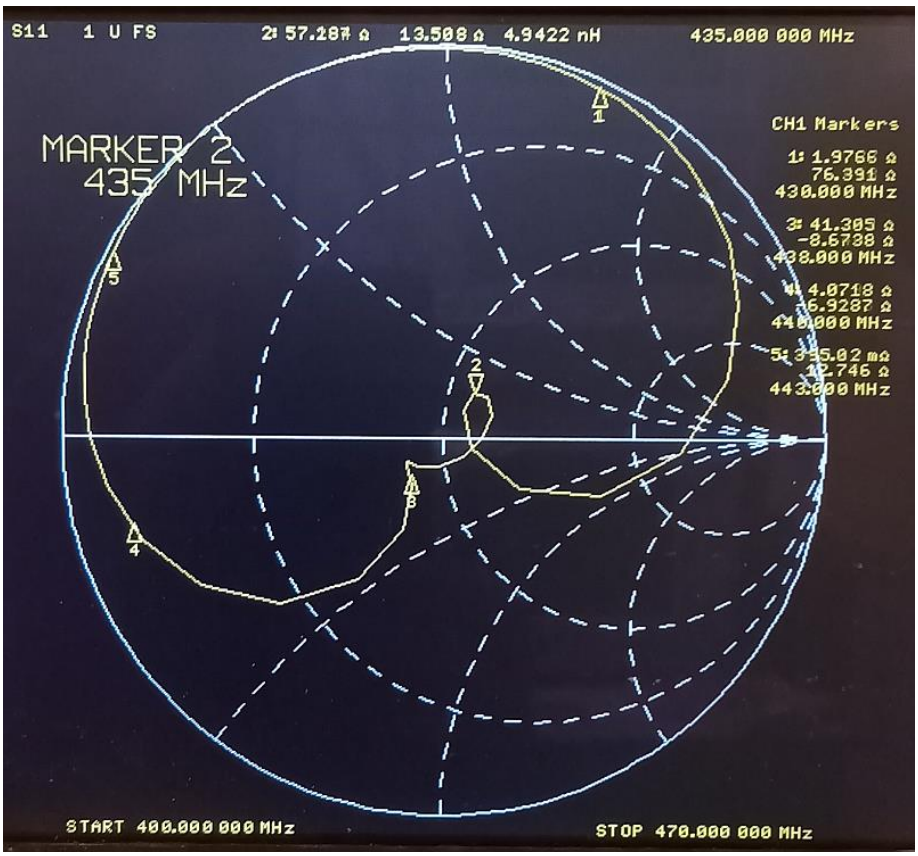


S22 log mag: return loss

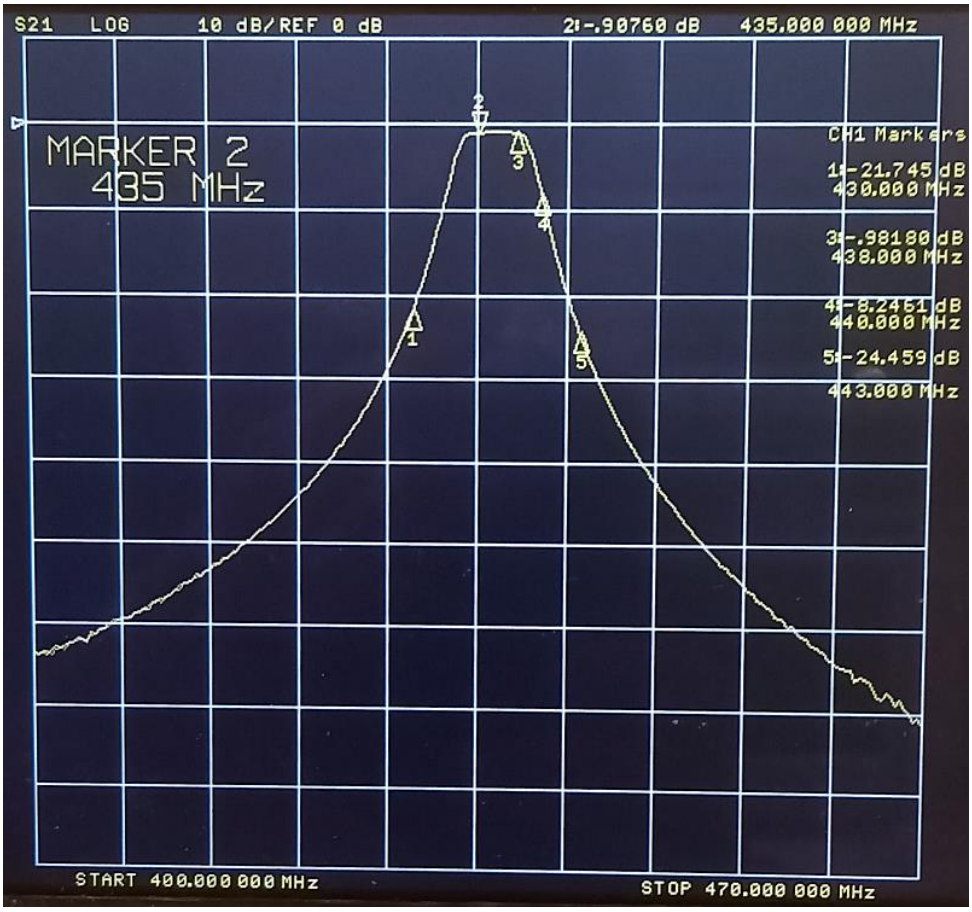
Next, I retuned the filter to the 70cm satellite band 435-438 MHz. It turned out quite well and here are the results.



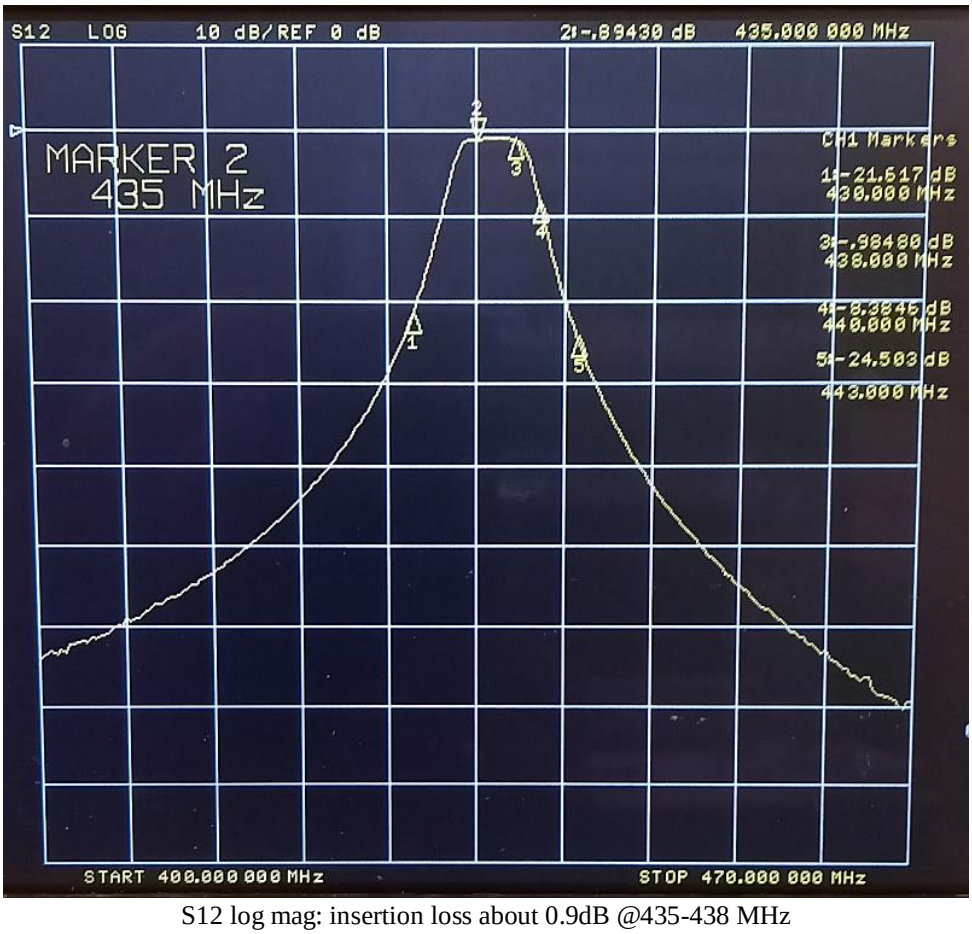
S11 log mag: return loss 17dB @435-438 MHz



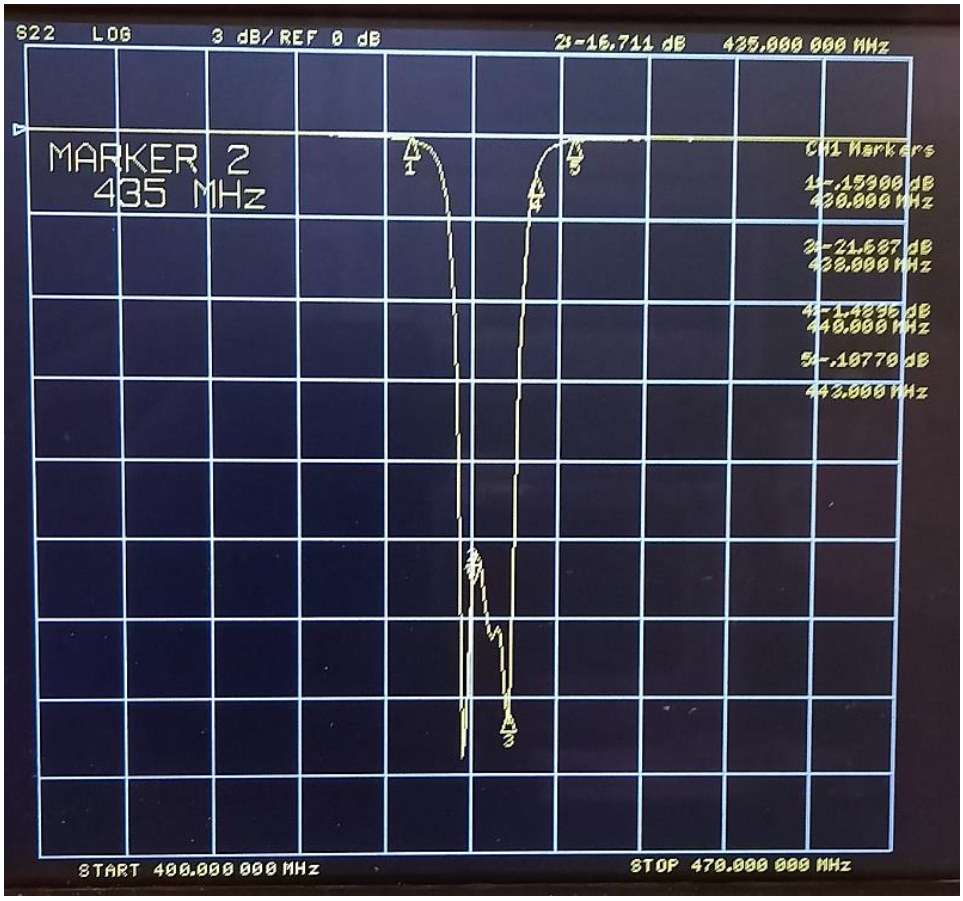
S11 Smith Chart



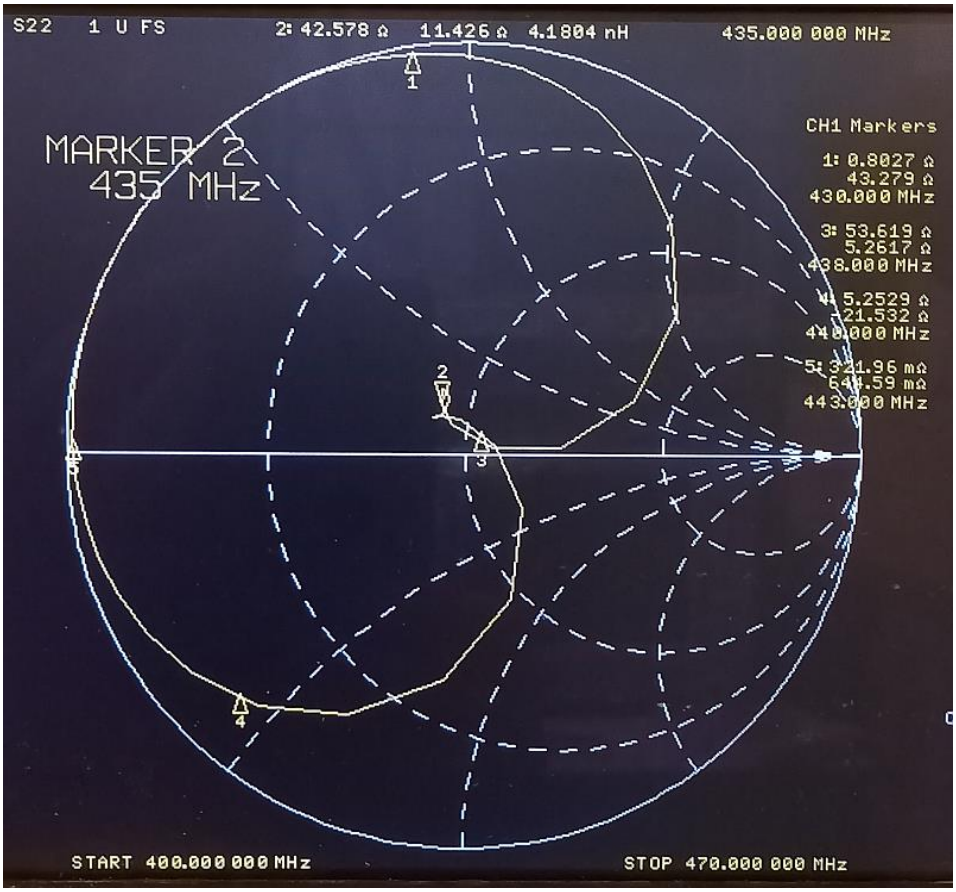
S21 log mag: insertion loss about 0.9dB @435-438 MHz



S12 log mag: insertion loss about 0.9dB @435-438 MHz

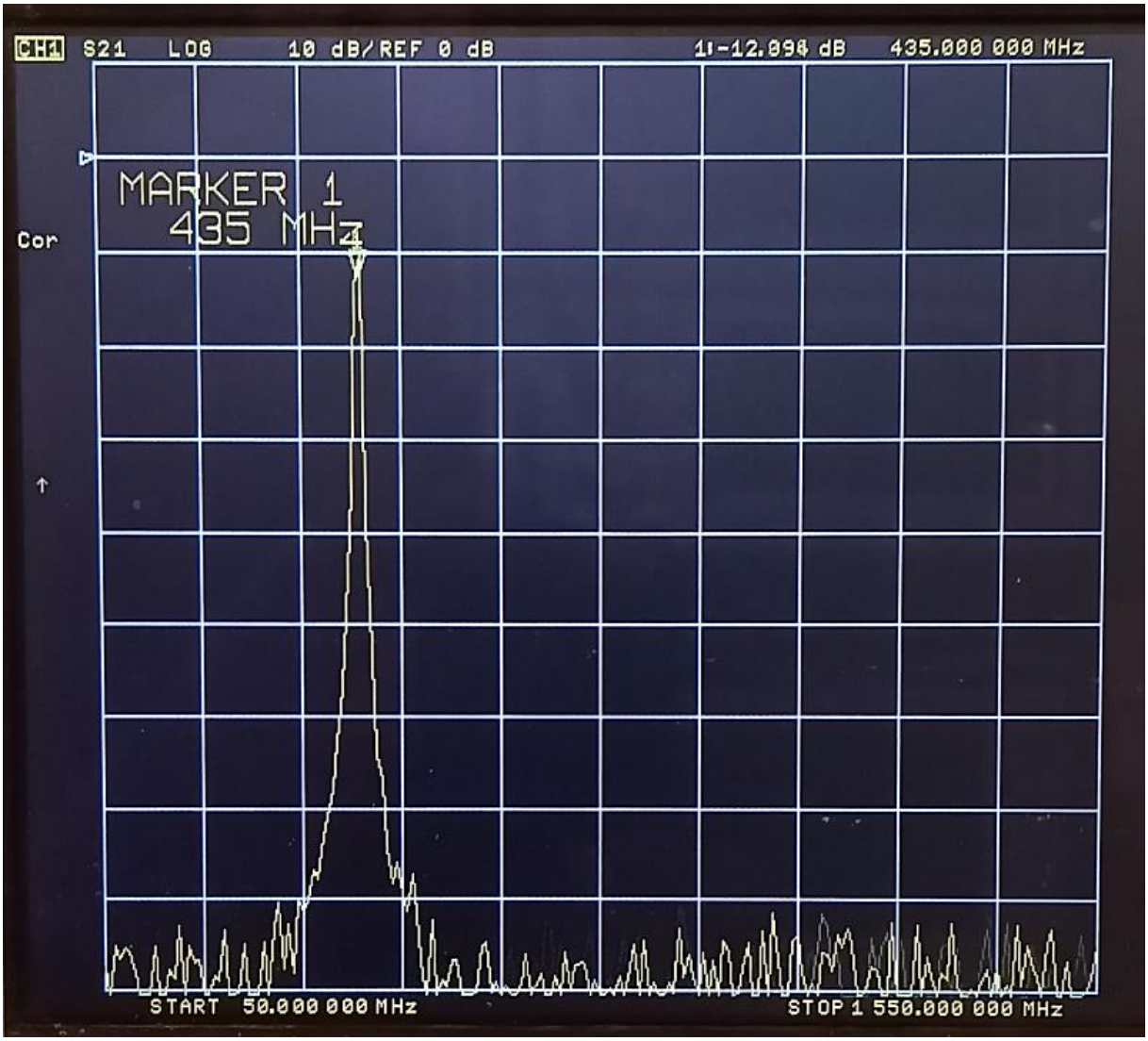


S22 log mag: return loss 17dB @435-438 MHz



S22 Smith Chart

Finally, I checked the response of the filter in a wide frequency range:



Frequency response of the filter in the frequency range 50-1550MHz

The filter shows no spurious responses in the frequency range 50 MHz to 1550MHz. Please note that the insertion loss at 435 MHz seems to be high as the frequency steps in the scan were to course.

In summary this filter can be easily retuned to 435MHz. Its low loss of about 0.9dB makes it suitable both as a highly selective receive filter for the 70cm band or as a transmit filter with an estimated power handling capability of more than 100 Watts.

I always appreciate feedback and will be happy to answer questions. Please send them to the Email address given below. Many thanks in advance.

Best regards

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