Description of the Fixed Bandpass Filter 612608-001 from Watkins Johnson

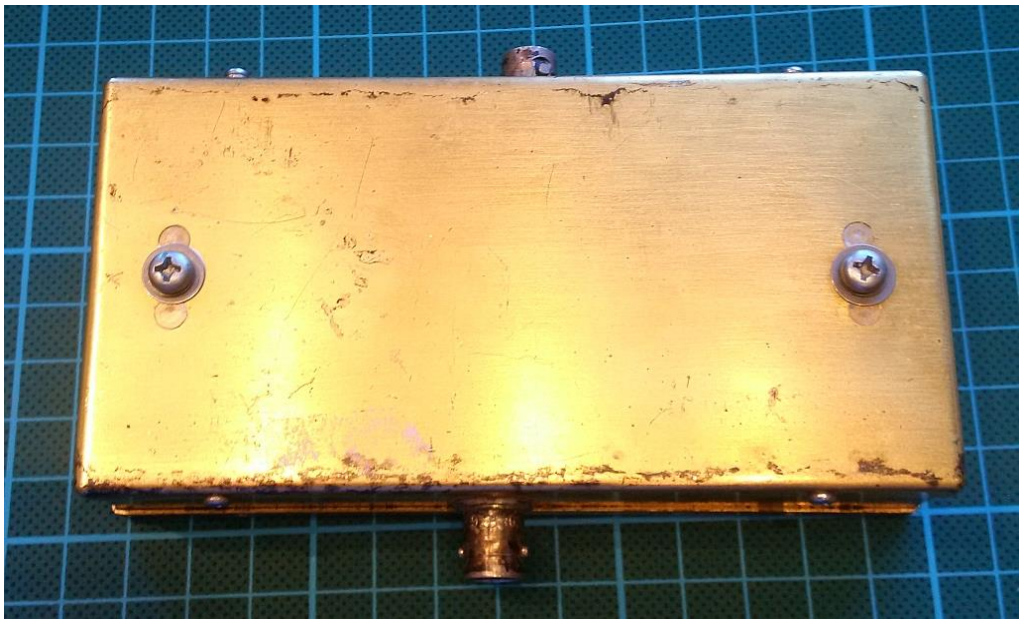
Matthias, DD1US, December 20th 2017

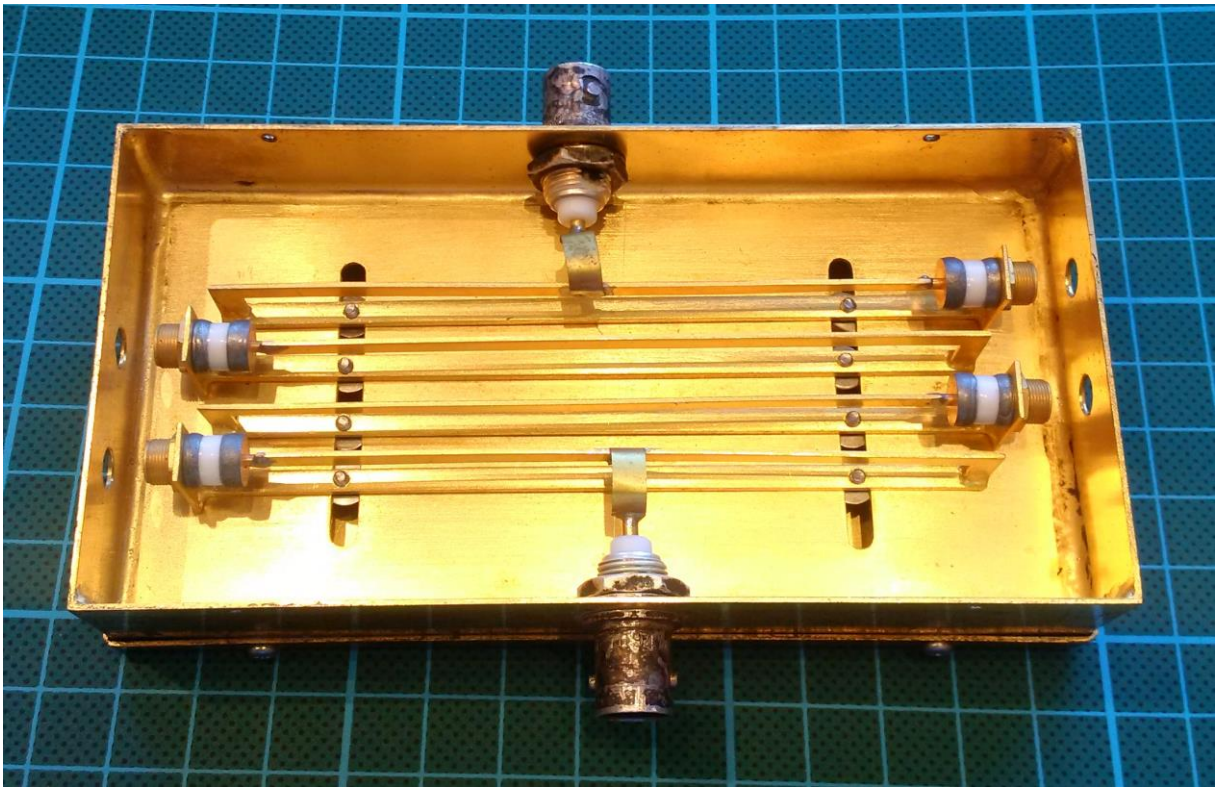
Hello,

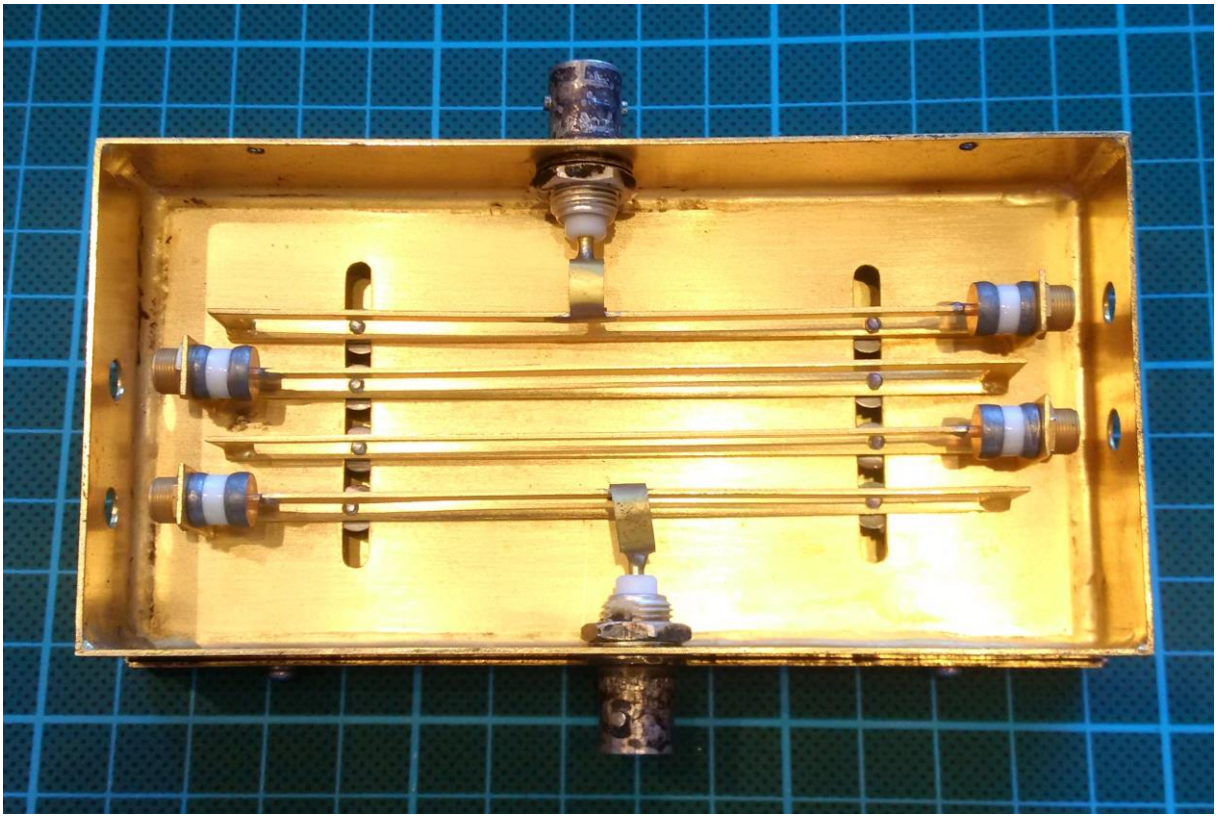
Recently I was able to buy a surplus bandpass filter second hand. It is a filter from Watkins Johnson with the type 612608-001. It is called “Fixed Bandpass Filter” but as I will show in this description it can be retuned very easily. The filter was originally tuned to 260-360 MHz.

The filter is gold plated inside and outside. Maybe this is the case because it has the serial number 1 ?

Here are some pictures of the filter:

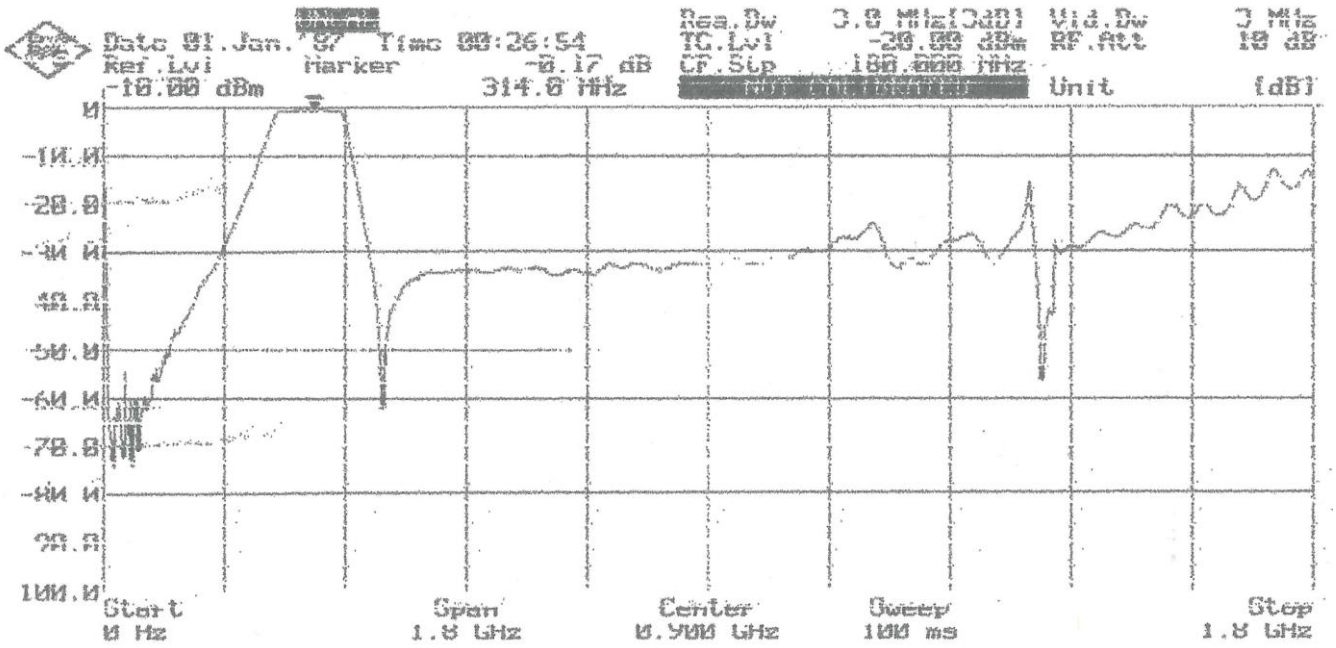




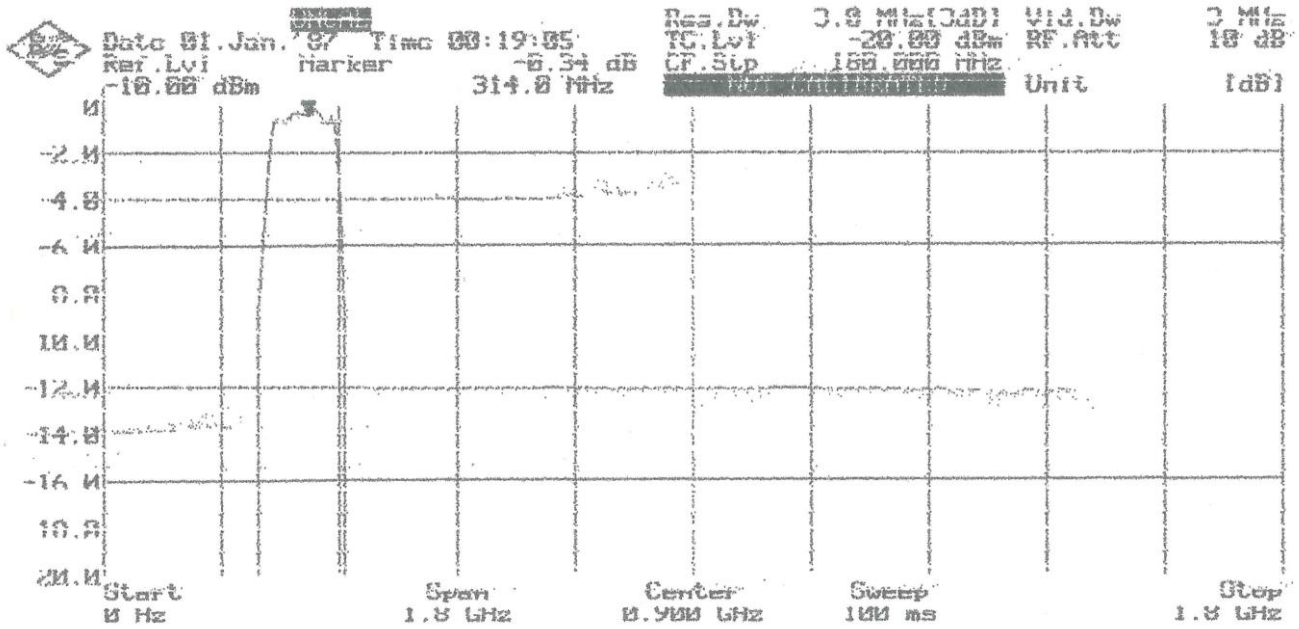


The filter consists of 4 parallel resonant tank circuits which can be tuned by high Q capacitors in center frequency. The coupling can be adjusted by moving the tank circuits laterally. I do not know why this filter is called fixed bandpass filter as it is highly flexible.

Here is the transfer characteristics of the filter as it was originally tuned when I received it (260-350 MHz):

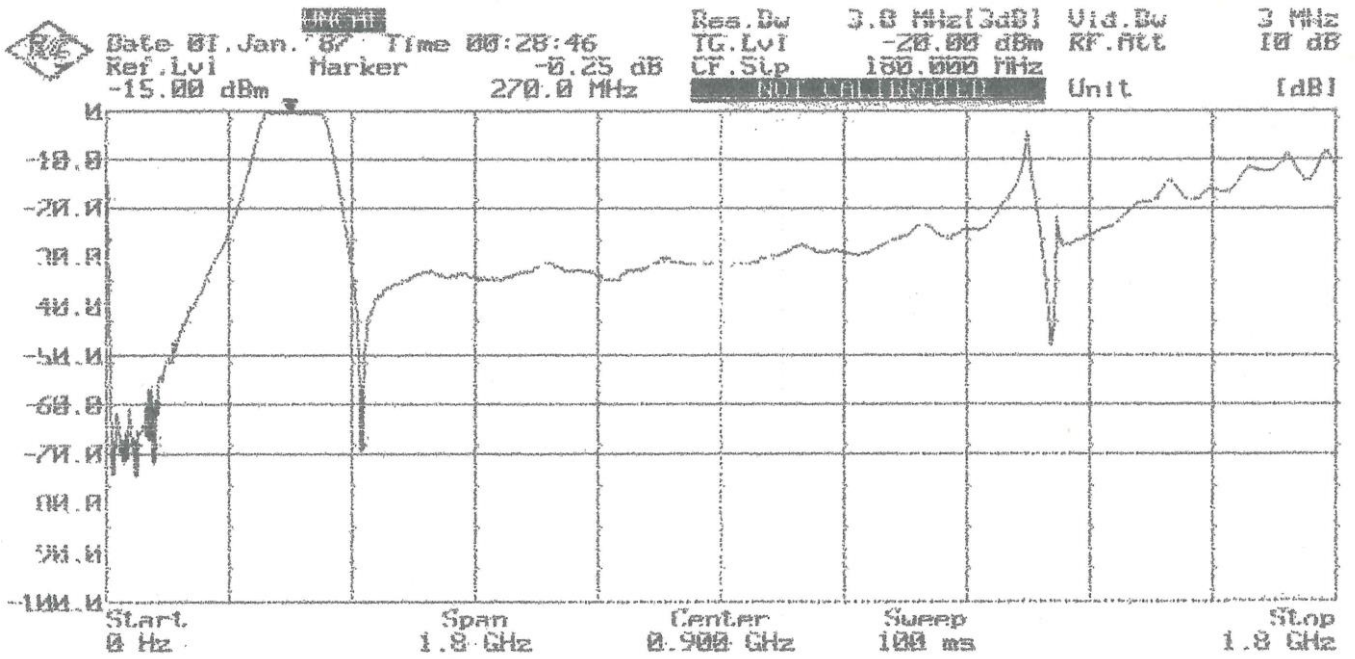


Sorry for the poor quality of the screenshots, I guess I will need a new printer cartridge. The out of band rejection above the passband is only 35dB degrading at frequencies above 1 GHz. This due to the fact that the tank circuits are not shielded in separate chambers.

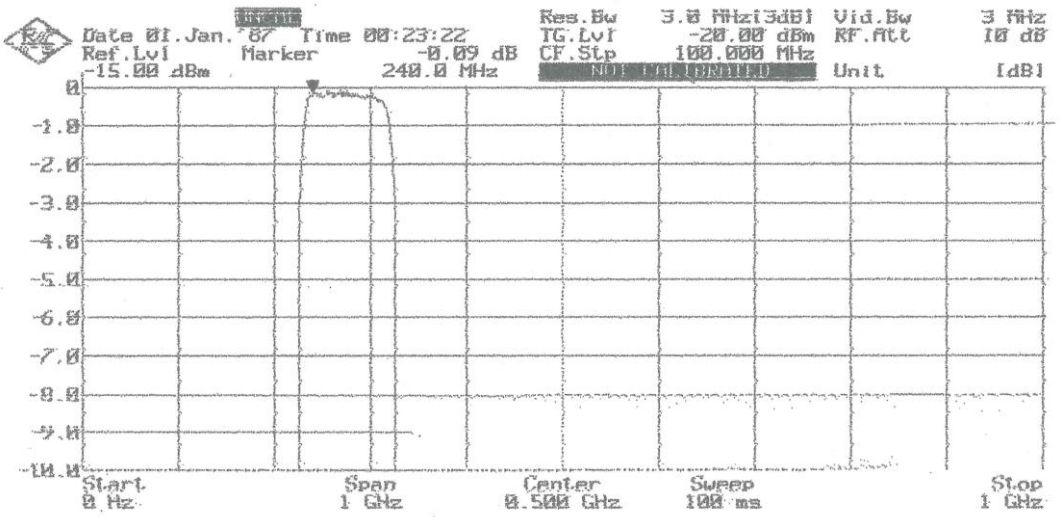


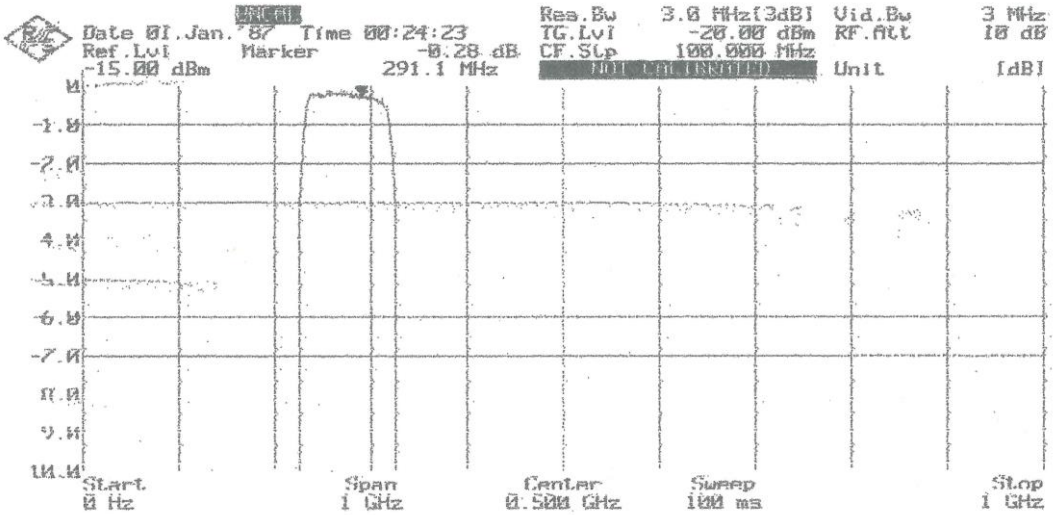
The filter has a nice shape factor and low insertion loss of about 0.35dB.

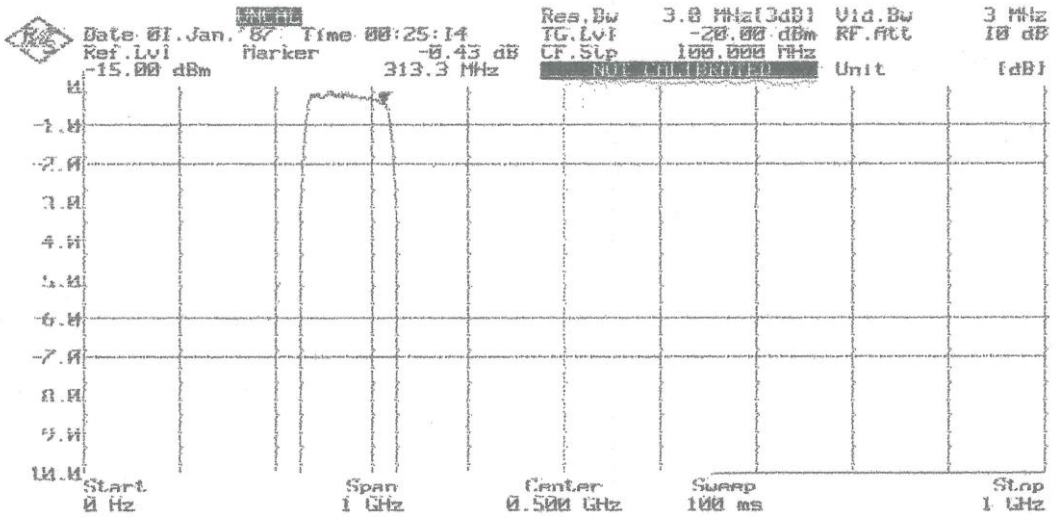
As I wanted to use the filter in the range between 240 and 300 MHz I retuned it accordingly:



The filter response in the passband is quite flat. Below the passband the rejection is about 50dB in the 100 MHz broadcast radio band. Above the passband the rejection is only about 35 dB (30dB above 1 GHz). There is a spurious response in the range of 1350 MHz which is no problem in my application.







The upper bandwidth after retuning is still a bit high which was no problem in my application. The filter has now an insertion loss of better than 0.3dB between 240 and 300 MHz.

I always appreciate feedback. Many thanks in advance.

Best regards

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