The Latest

Interference from AM Station

Up

Posted by AG6QV Frank
Tags: HAM | HF

I have an AM station less than 5 miles from my location. During the daytime the transmitter is operation at 50 kW, which makes it almost impossible for me to heat anything on the HF bands, especially when using the long end-fed dipole. I have no problem receiving on the 23 foot vertical, bit the radiation pattern on that antenna is far from optimal. I have worked a few stations transmitting on the end-fed and listening on the vertical, but that is a bit tricky, especially on digital modes where there is little time between the RC and TX cycles.

So in order to get rid of the unwanted AM signal below 1.8 MHz I decided to build a high pass filter and insert it into the feed line close to the station. That way it will work on both of my HF/6m antennas, or any of the additional antennas I'll connect to the 6-way remote switch I have installed close to the feed point to avoid running to many coax cables.

In the past I have used the LC Filter design tools provides by Marki Microwave. After a bit of experimentation I ended up with an 11th order Chebyshev configuration with 6 capacitors and 5 inductors. The inductors was created by 13 and 15 turns on a T106-2 toroid and the capacitors are SMD 1206 100V MLCC. This should have no issue handling the 100W power I will be putting through the filter when transmitting.

1.8 MHz High pass filter

I created a PCB layout in KiCAD. It had been a couple of months since I used KiCAD so I started by updating to the latest version (9.0). If I ever get good at using this tool I hope to use it to design microwave boards in the future.

1.8 MHz High pass filter (KiCAD)

The PCB Layout is relatively simple and is almost identical to the schematic.

1.8 MHz High pass filter (PCB Layout)

The fabricated PCB arrived today from JCL PCB.

1.8 MHz High pass filter (PCB Layout)

And after a few minutes of soldering the board was assembled at placed in-line of the coax cable.

1.8 MHz High pass filter (PCB Layout)

It was now ready for the big test. To start with I recorded 10 seconds of audio without the filter in place. This was recorded on 30m (10 MHz) with the radio tued to the FT8 Frequency.

Then I installed the filter and recorded another 10 seconds of audio:

For some both of these files might sound like noise but for me there is a clear difference and the S9 noise is now gone and with this filter in place I'm now able to receive stations even with the AM station operating at 50 kW just 5 miles from my QTH. Next project will be to find an enclosure or simply 3D print a small box for it.

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