Portable Setup for SSB operations via QO-100

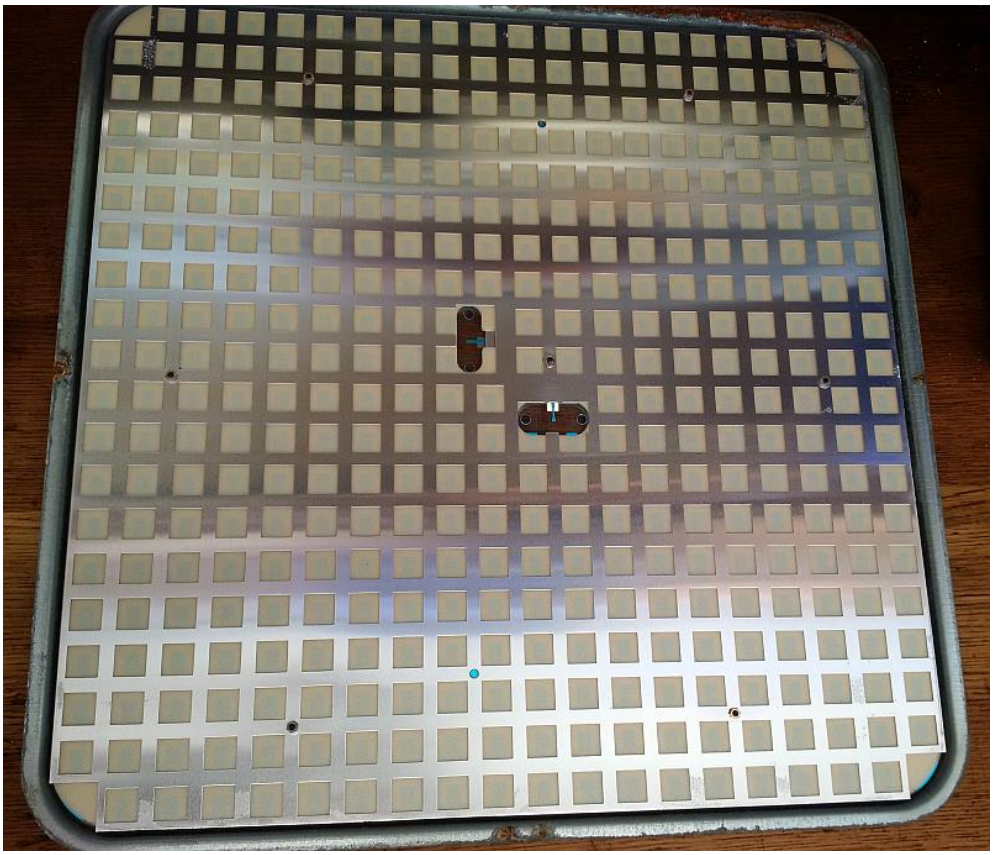
Matthias, DD1US, October 27th 2019

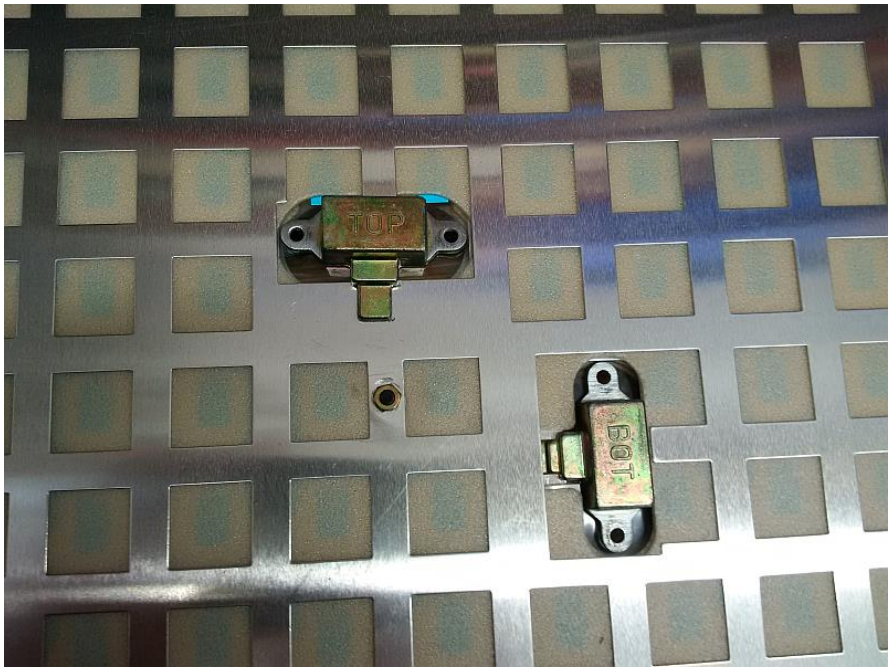
Hello,

After having finished my permanent setup for QO-100 operations on the NB and wideband transponders, I decided to also build a portable setup. The target is to be able to set it up within a few minutes and have it small enough to fit in the trunk of my car without problems.

I decided to try patch antennas for the 2.4 GHz uplink as well as the 10 GHz downlink because they are flat and have not parts sticking out with have to either be disassembled or are prone to damage during transportation.

I found an old SAT-TV flat panel antenna from Kathrein, the part number is probably BAS-65 but I am not sure. It showed strong corrosion and was in a pretty bad shape, thus I had to disassemble the antenna I order to clean and reseal it. I also removed the original downconverters on the back because they were not suitable for narrowband operations via QO-100. Here are some pictures:



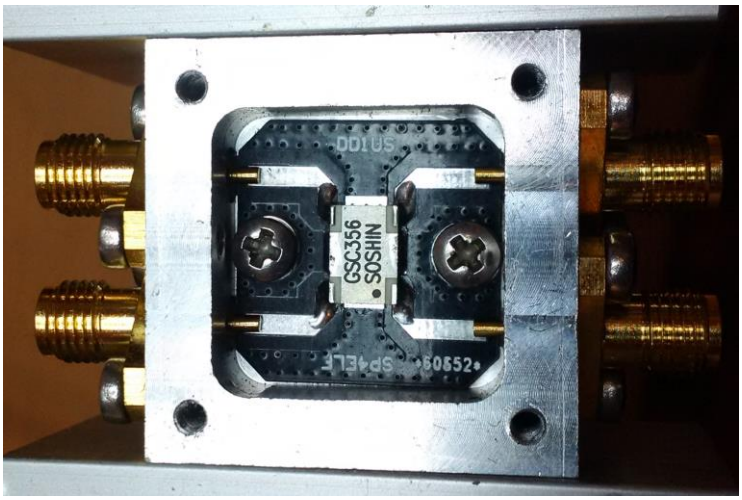

TOP
BOT

After cleaning the antenna structure including the connections of the antenna to the waveguide and reassembling everything, I mounted a WR75 waveguide angle adapter, which I found in my storage area. Finally a mounted a NORAD PLL LNB with a local oscillator of 10 GHz to the receive antenna setup.


PLV-611A

For TX I bought a patch antenna with horizontal and vertical polarization ports.

I will feed the 2 ports with a 90 degree hybrid combiner to in order to get RHCP as needed for the QO-100 uplink.



As I had a small tripod from one of my telescopes. I bought a surplus military tripod adapter and modified so that I can mount the antenna setup on the tripod and can easily adjust elevation and skew angle.

Here are some pictures of the setup: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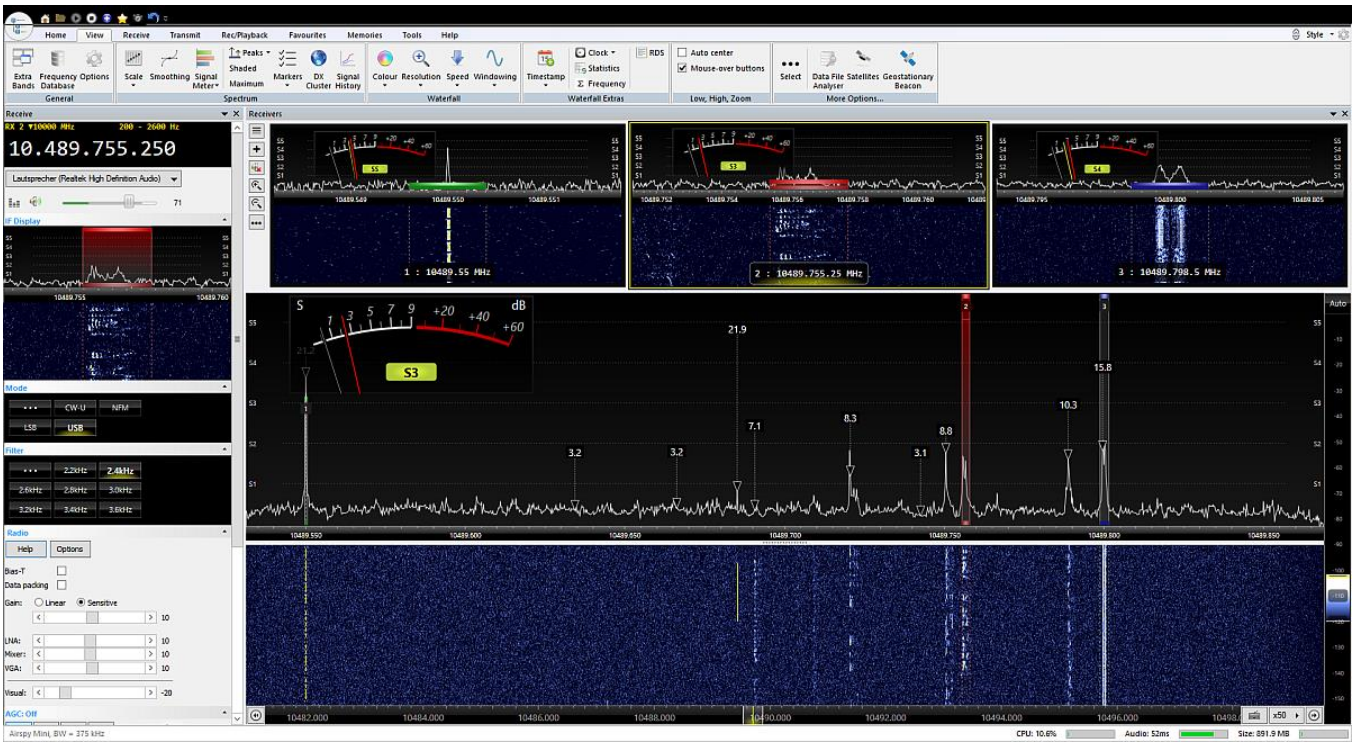
Using an Airspy mini I tested the receive antenna and here is a screenshot from SDR-Console:



After adjusting the noise floor to S0 using the visual gain settings in SDR-Console the CW beacon was S 4…5 and the PSK beacon S 3…4. I have to do some more testing to convince myself that the setup is really good enough for proper satellite operation in SSB via QO-100.

Also uplink tests will follow in the next days ….

I will be happy to answer questions or receive comments. Please send them to the Email address give below.

Kind regards 55&73

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