

Microwave Special Interest Group

1. Introduction

We have started a “special interest group” of individuals who have an interest in building their own Microwave gear. Building one’s own gear promotes learning about Microwave transverter operation without spending a lot of money. Also one ends up with a usable transverter.

The intent is not to force everyone to build the same transverter at the same time. It is up to the individual members which transverter(s) they are interested in building. We are here support any effort that can to get more people on the air.

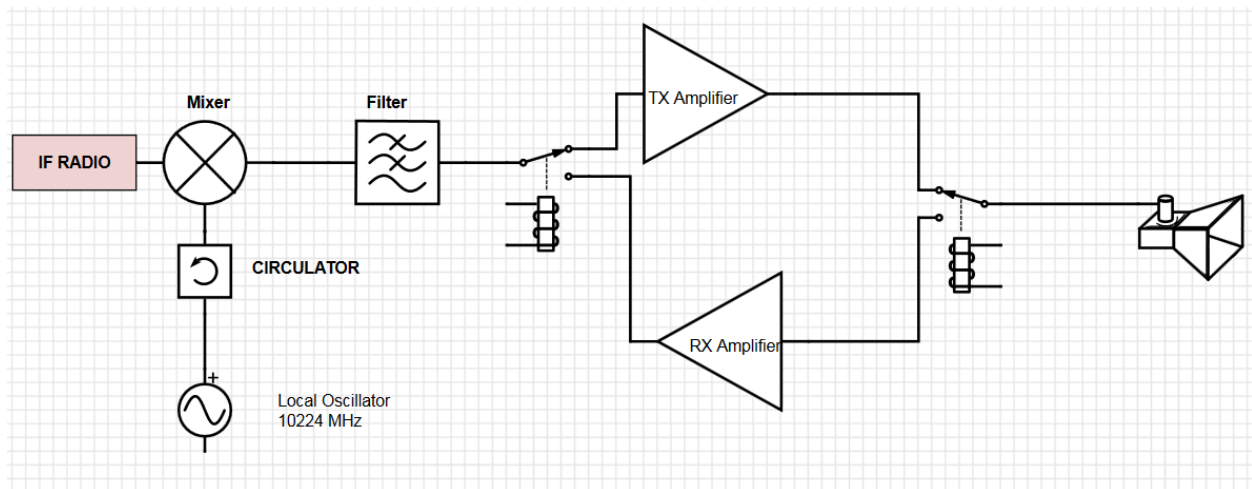
Please use the reflector at:

<https://groups.google.com/forum/#!forum/pnw-microwave>

for comments or to ask questions. Also the group is not restricted to PNWVHF members – all are welcome.

2. What is a Transverter?

A high level view of a very simple transverter is shown below:



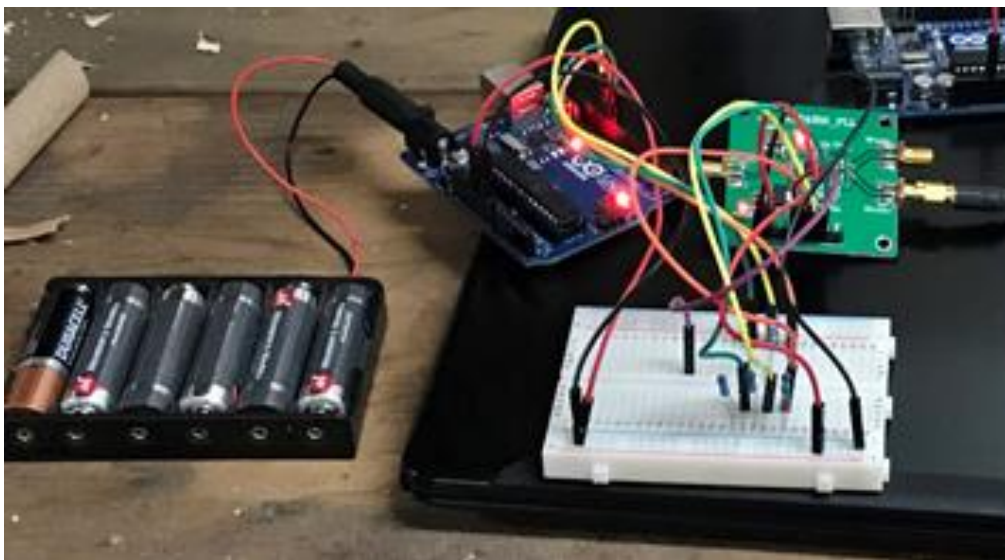
My 10 GHz Transverter initially consisted of just such a configuration.

The frequency stability of a transverter is dependent on both the IF radio and the local oscillator. In the past one of the stumbling to building a transverter has been to have a stable local oscillator.

3. Local Oscillator

We have recommended the use of the Analog Devices ADF4350 as the local oscillator. The advantage is it is inexpensive (less than \$20) and can be easily locked to an external 10 MHz frequency reference (if desired). The ADF4350 is combined with an Arduino processor to set it to the desired frequency. The software was originally written by F1CJN and then modified by me for this specific task.

Here is a picture of such a setup:



The ADF4350 fundamental covers the range from 2.2 to 4.4 GHz. With its built in divider

it can cover down to 137.5 MHz. This makes it ideal for all bands up to 3456.

For higher bands it is necessary to add a multiplier (also provided by W1GHZ). For 5760 he has an x2, x3, x4 board (aka Personal Beacon for 5760 or 3456 MHz) and for 10 GHz he has an x9 board (aka Personal Beacon for 10 GHz).

***New - LO or Personal Beacon for 5760 or 3456 MHz
from Microwave Update 2015***



LO or Personal Beacon for 5760 or 3456 MHz - Flexible Multiplier Board

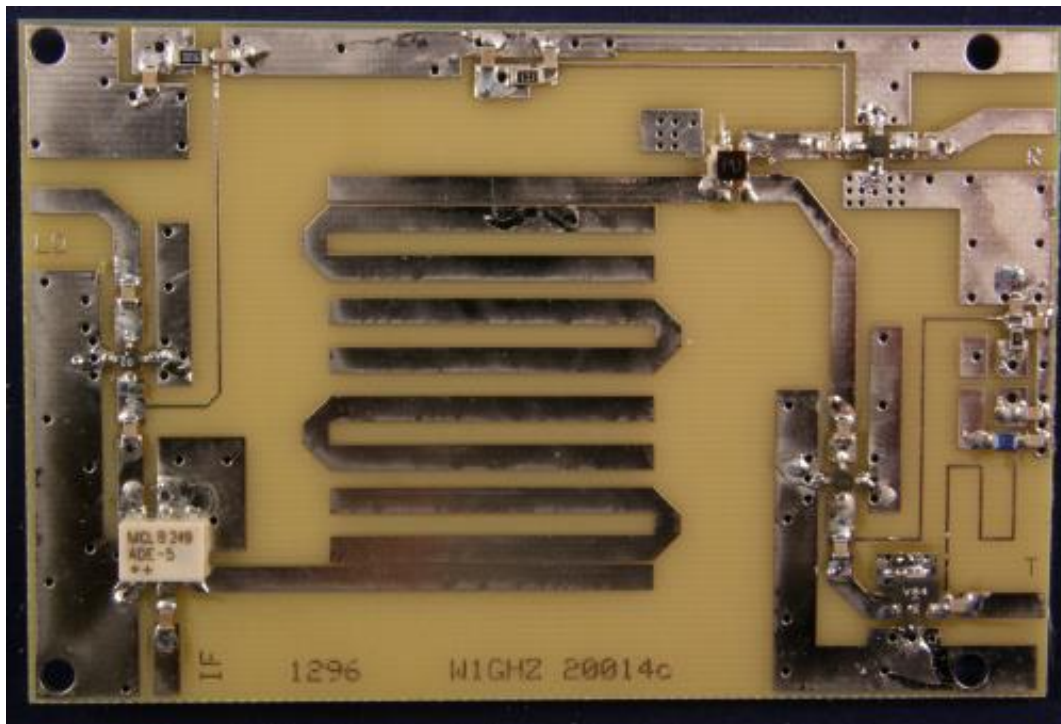


10 GHz Personal Beacon or LO for 8 to 12 GHz

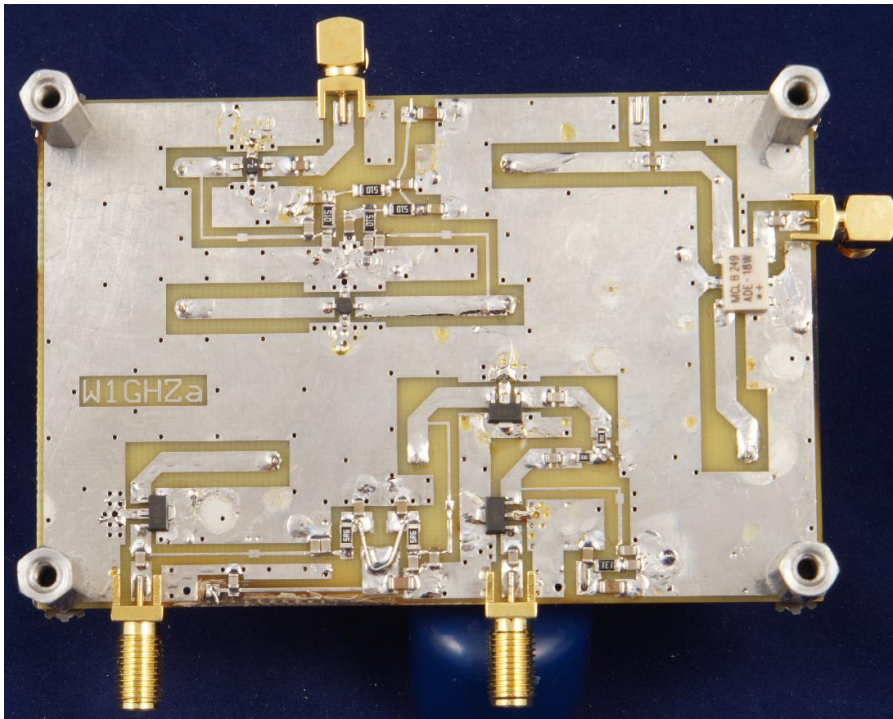
4. Group Build Project

Members who are in the Seattle metropolitan area have decided to meet regularly to build and troubleshoot transverters for the bands 903 MHz and up primarily based on Paul Wade's (W1GHZ) "Multiband Microwave Transverters for the Rover." For more information see:

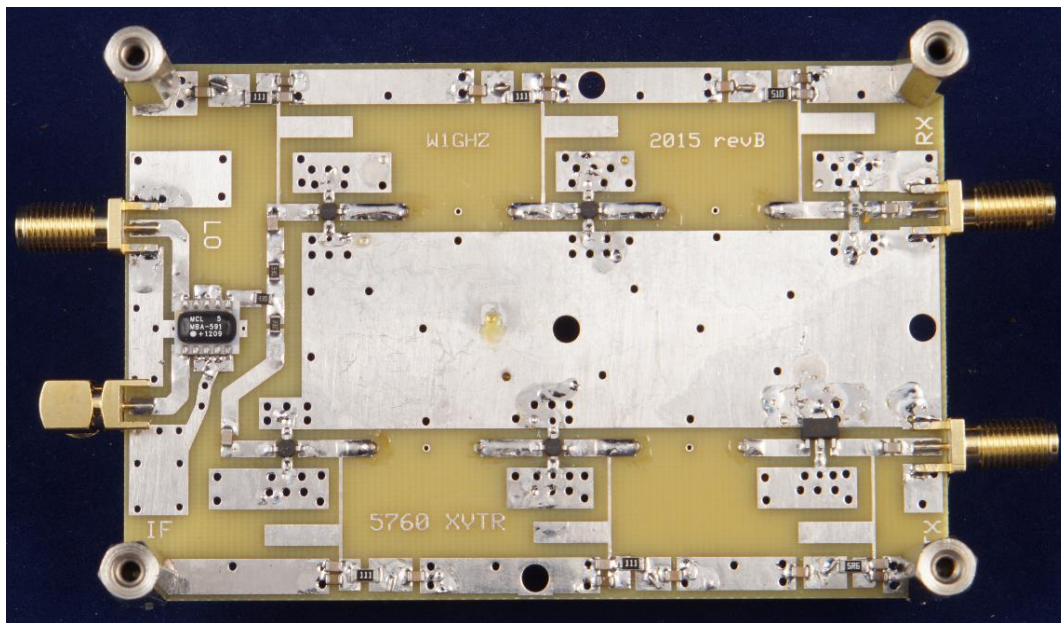
<http://www.w1ghz.org/MBT/multiband.htm>.



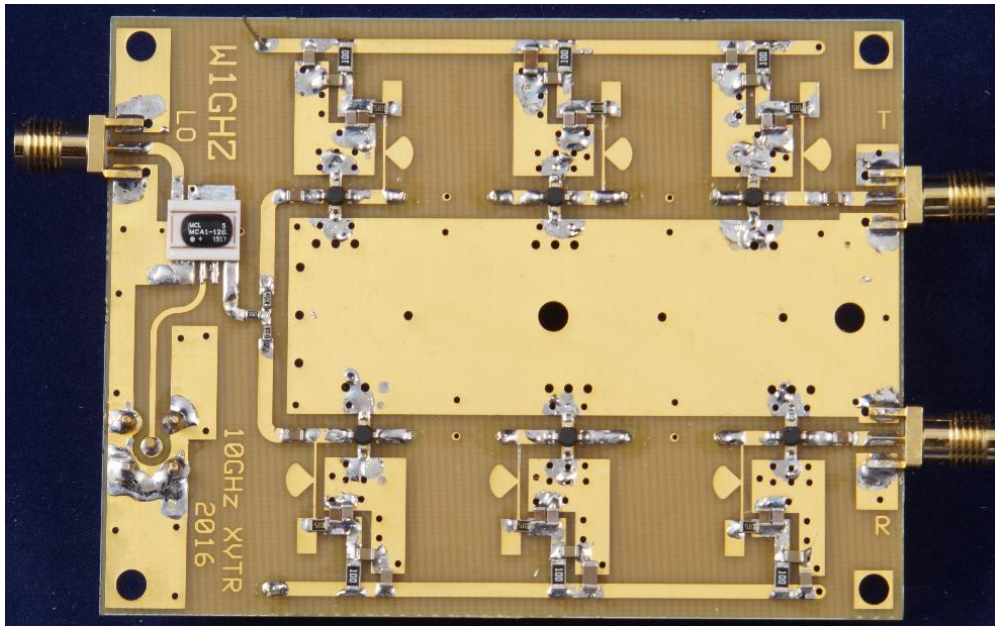
903/1296 Transverters



2304/3456 Transverters



5760 Transverter



10 GHz Transverter

So far we have gotten together two times to assist in building and testing transverters. We plan to have another meeting at the end of October to discuss packaging the boards into a box and in November hopefully be ready to go out and actually use them in the field and make contacts. We have started out with 903 and 1296 as these bands have most of the activity during the contests and the transverters are relatively straightforward to build since the filters are etched onto the PCB boards.

5. Future Plans

As confidence is attained hopefully people will continue onto the higher bands. In the local area during recent contests most activity after 903/1296 has been on the 2304 band (due to the advent of SGLAB transverters some of the SOTA group is now on 2304) – see <http://www.sg-lab.com/amateur.html>).

I would like to put in a personal plug for the 10 GHz band. There are interesting propagation modes on 10 GHz that are not as apparent on lower bands such as rain scatter (see <http://www.walmba.org/10grain.htm>) - a natural for the wet side in the winter as well as airplane scatter. Another interesting site is <https://slideplayer.com/slide/1614719/>. A plus of 10 GHz is the very high gain possible with small portable inexpensive (sometimes free – talk to KG7P) dishes. For example a DSS 18” satellite dish has 30 dB of gain (the effective radiated power 1000 times the transverter’s power).

Bob, W7PUA, has expressed interest in making contacts from Mary's Peak in central Oregon to individuals up in the Puget Sound area. Rick, W7RNB, has expressed particular interest in working rain scatter. Al, W7HDD (CN96) is also interested in 10 GHz operation as well as others.

Another avenue would be arranging interesting events. One event could be a VUCC party (on 3.4 GHz and above only 5 grids are needed for VUCC) where I and possibly others would wander around to 5 grid squares while other participants would be staged at a location with a view to 5 other grid squares. Another event could be organizing an antenna range party for antenna testing or trying particularly interesting paths.

Other parts of the country have designated Microwave Activity days. We could look into something like that if we could drum up the interest.

Summary

The intent of this group is to foster learning and have a good time while doing it. If you are interested in participating, watching or just being kept up to date with our progress please feel free to join the Microwave Special Interest reflector at:

<https://groups.google.com/group/pnw-microwave>.

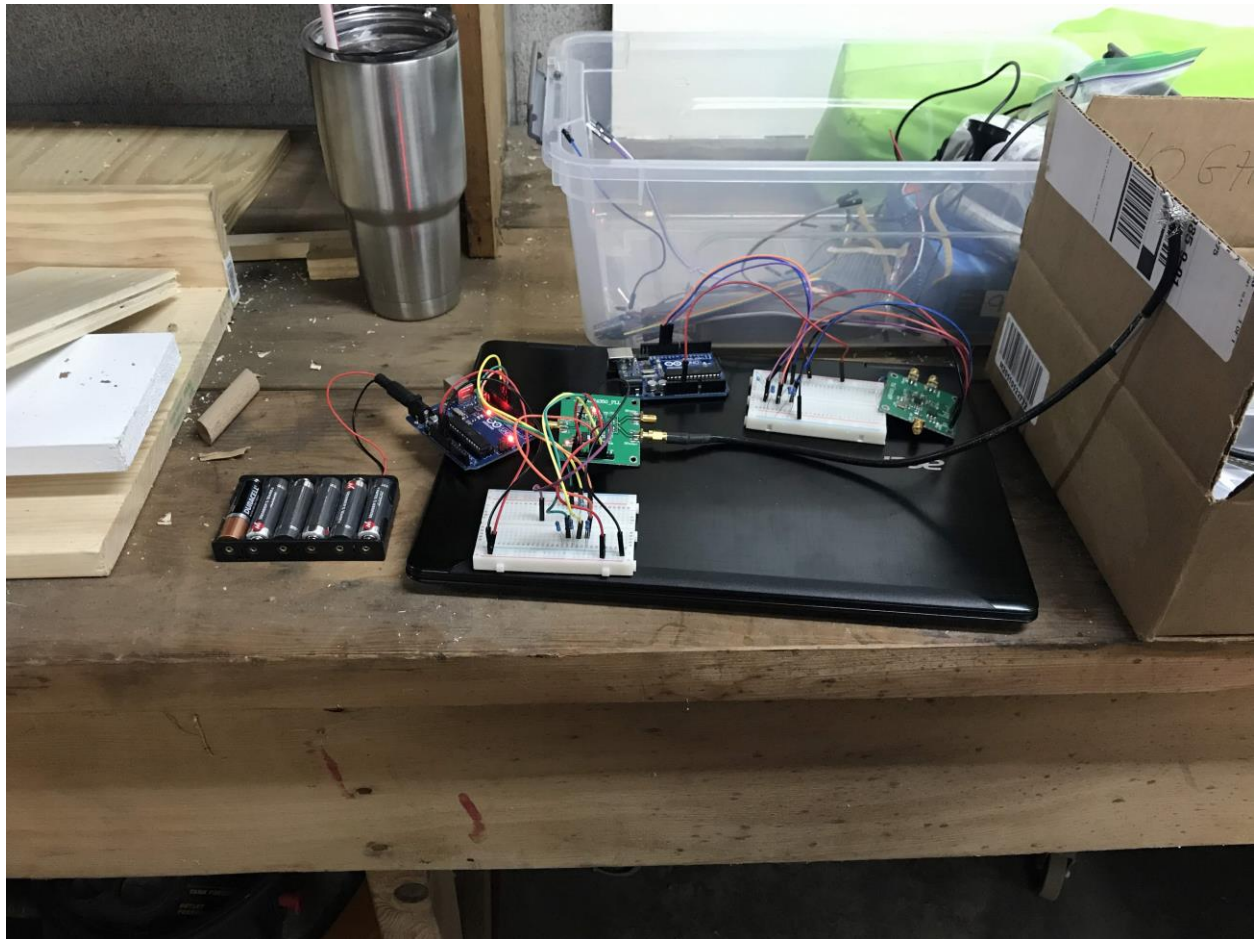
6. Photos



Demonstration by Dale, KD7UO, in a SMD Parts Holder



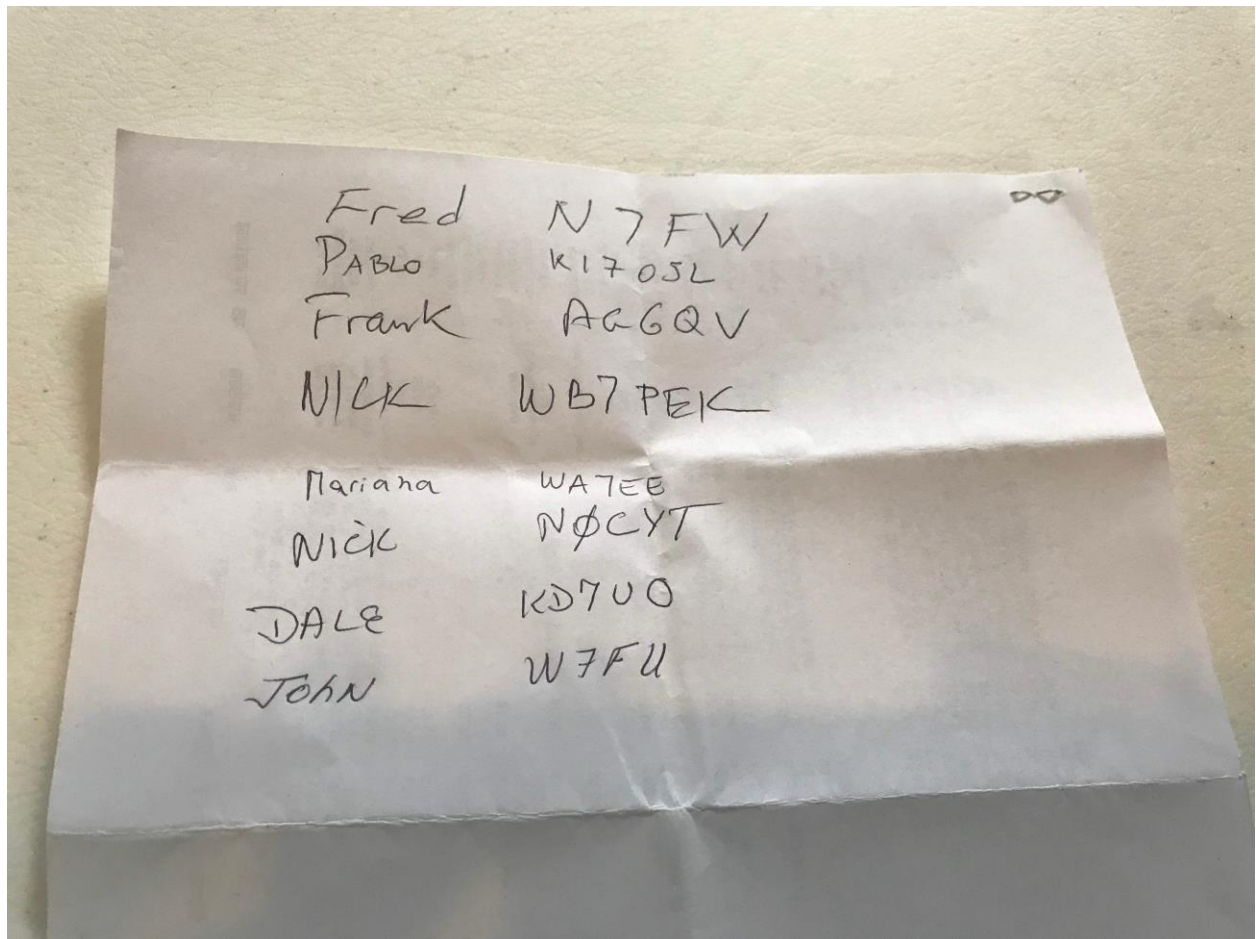
Programming an ADF4350 LO



Testing an ADF4350 LO



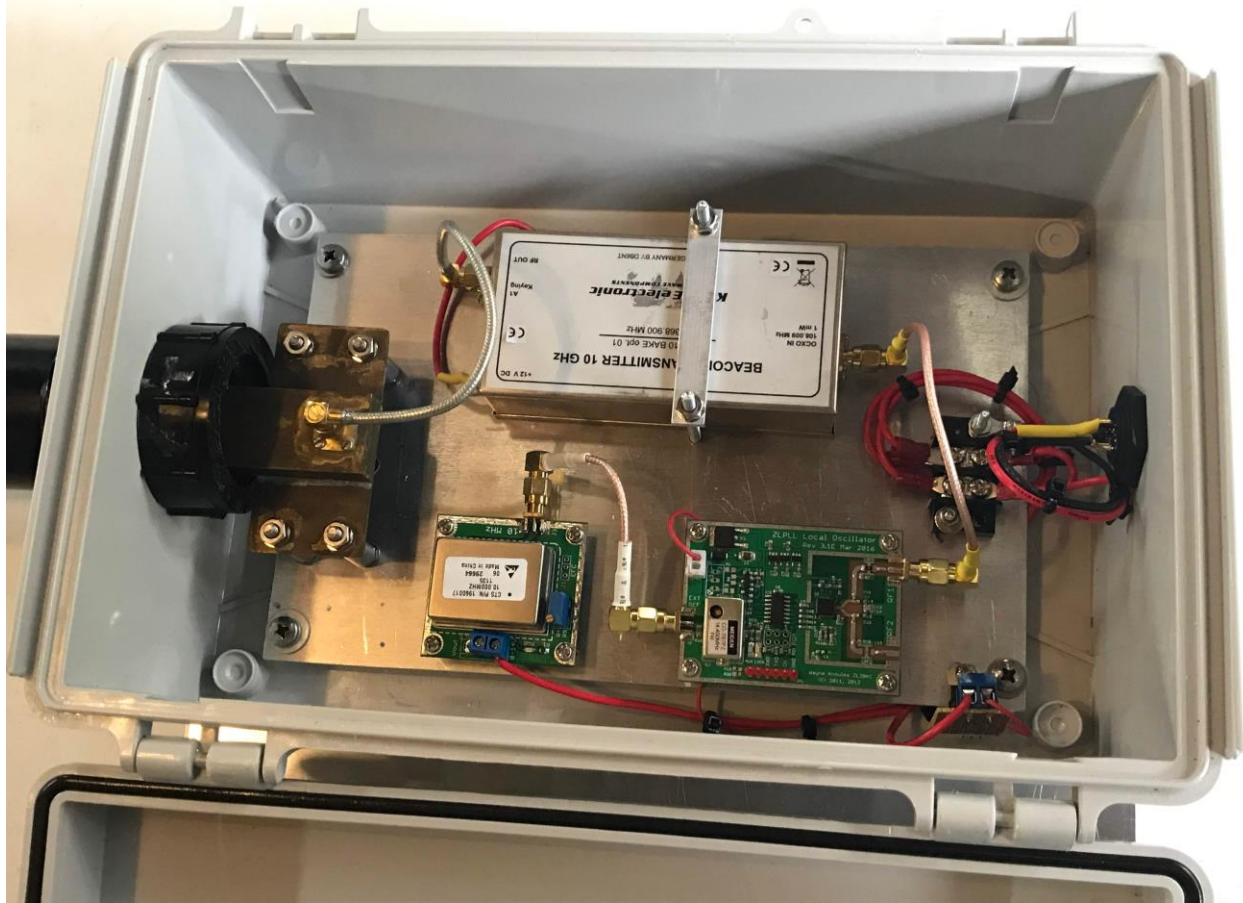
Lots of Activity



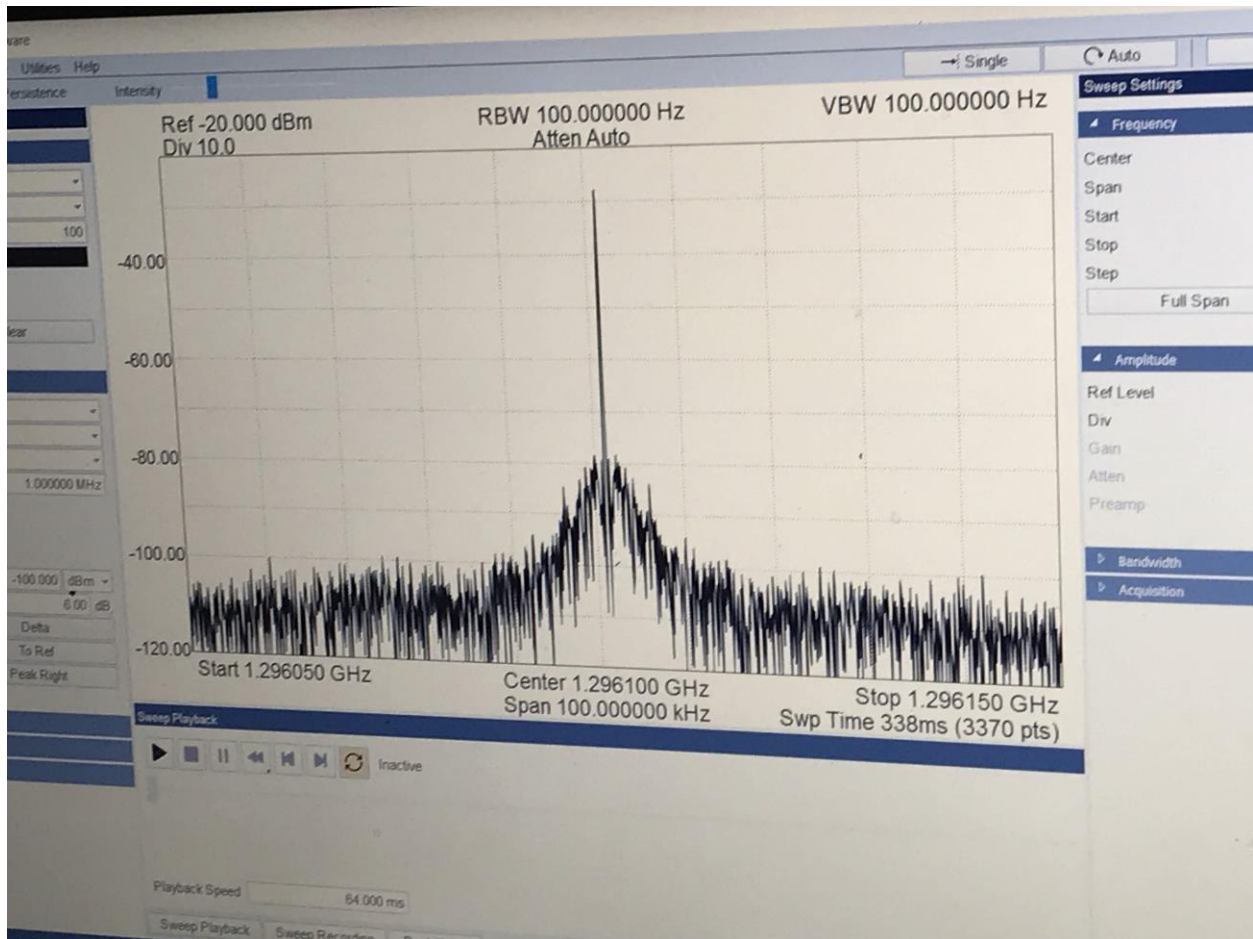
Attendees of the First Build



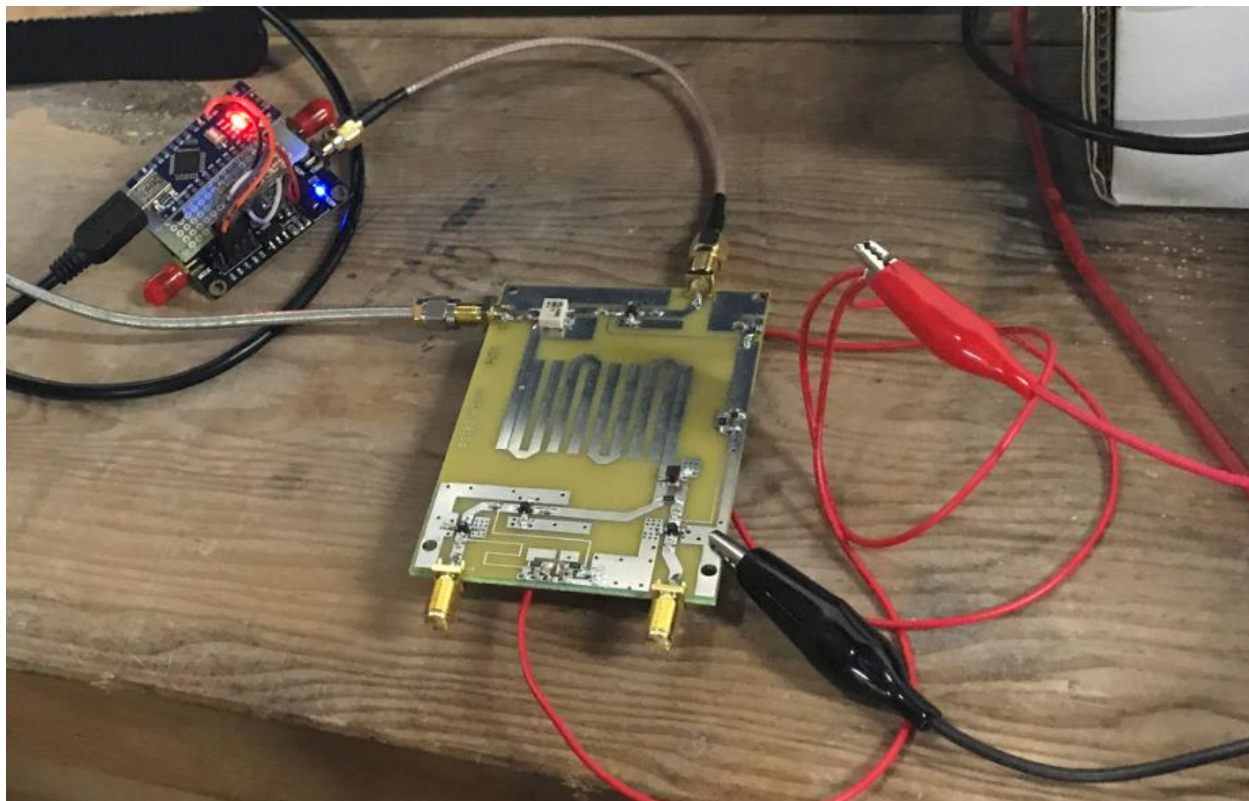
James, W7TXT, Showing his 10 GHz Beacon at our 2nd Build



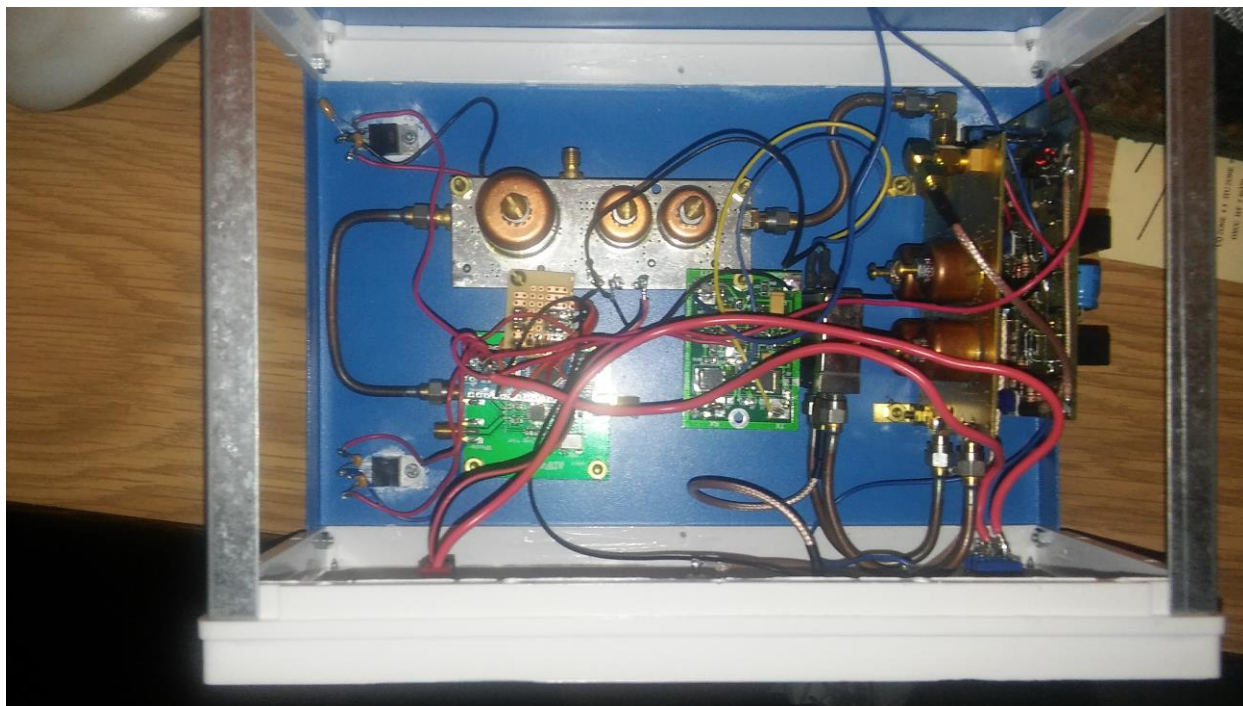
Inside the Beacon



Spectra from ADF5355



W1GHZ Transverter



My W1GHZ 10 GHz Transverter

Movies

Marianna Makes Her First Contact on 1296

Fred Makes his First 1296 Contact with his W1GHZ Transverter