

MUD 2025 VUCC Adventure

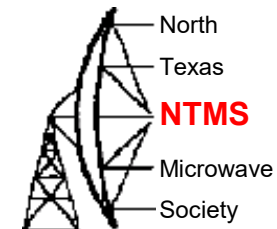
W5LUA

AI Ward

Cowtown

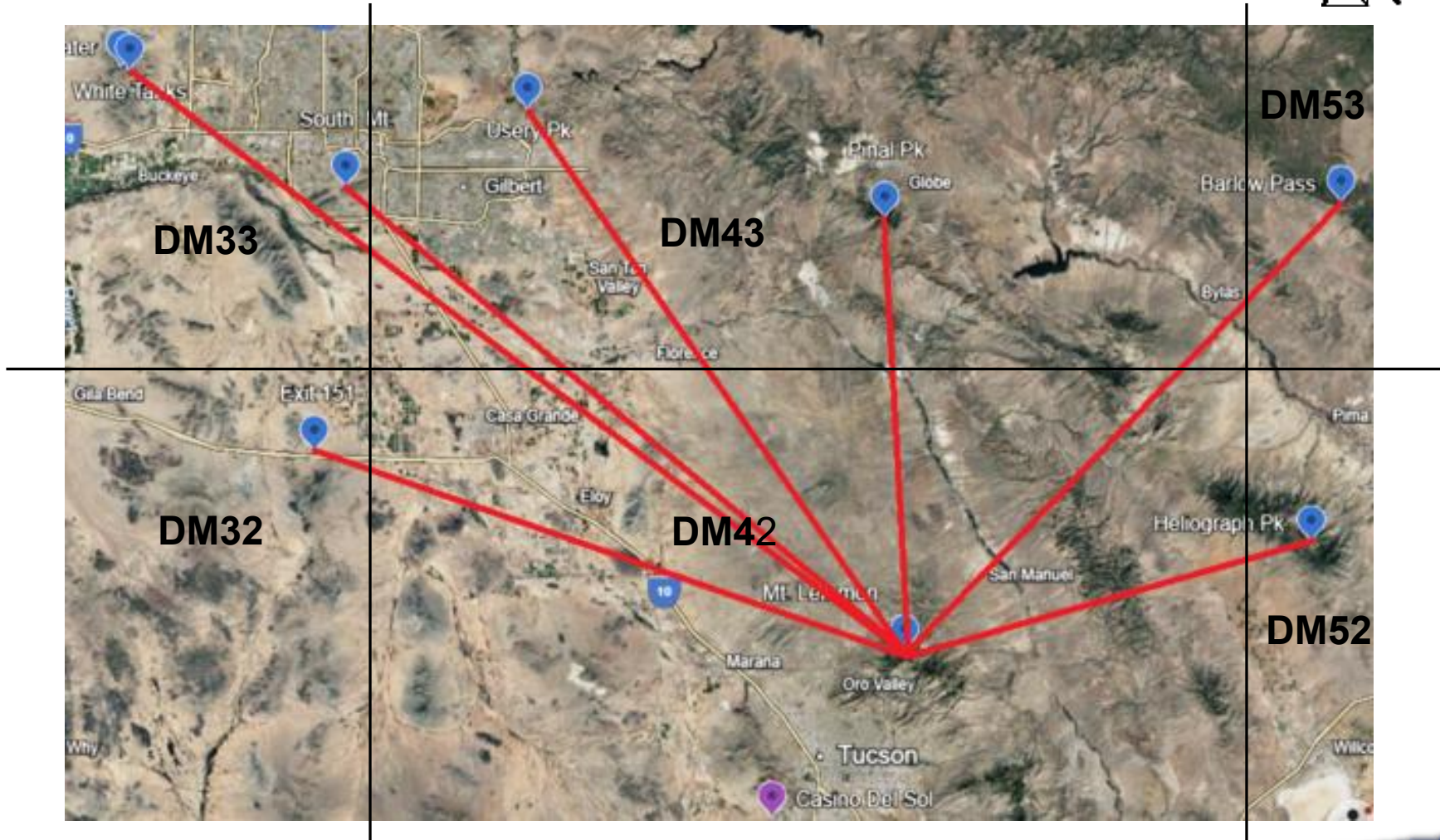
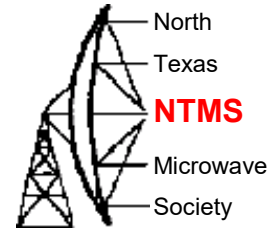
January 17, 2026

Intro & Goal

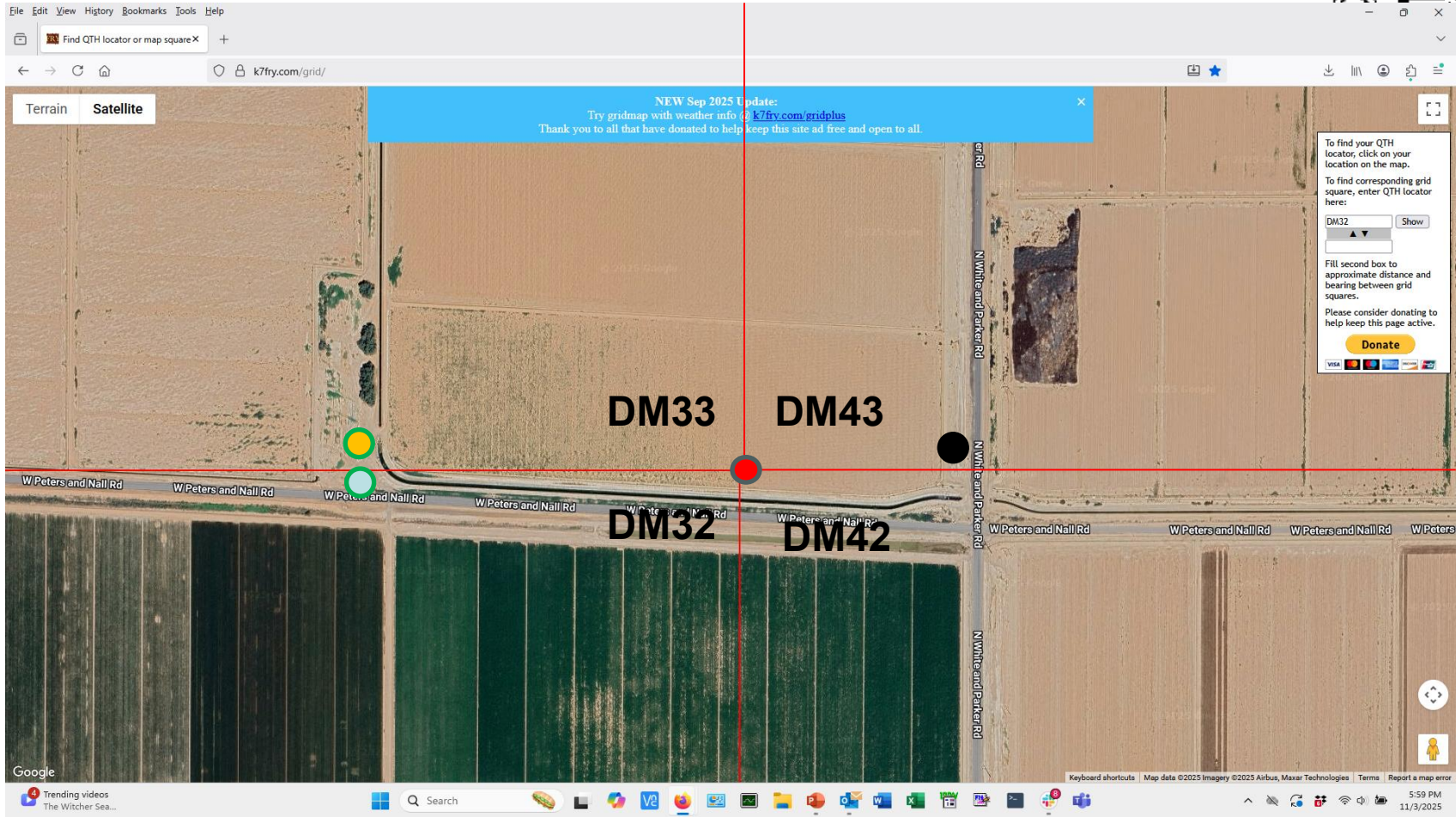
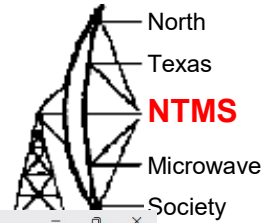


- Microwave Update was held in Tucson, AZ on Oct 23, 24, and 25th
- <https://microwaveupdate.org/>
- In the days preceding MUD, the goal was to provide the opportunity for stations to work VUCC on 24, 47 and 76/78 GHz.
- The majority of stations were camped out on Mt. Lemmon in DM42ok
- I decided to do a bit of roving
- Establish DX records if conditions allowed

Phoenix / Tucson area

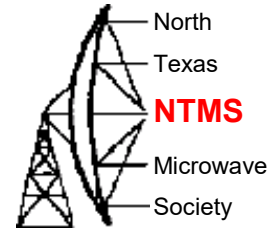


4 Corners Grids – in a Field!



Operated first in DM32 , then moved vehicle 10 ft north to DM33 

Ground still pretty soggy



DM32 / DM33 area
DX to Mt. Lemmon 130 km

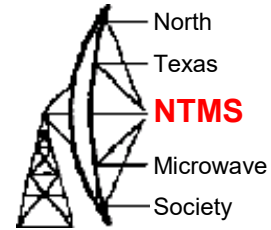


Looking towards Mt. Lemon



Checked out the area on Oct 13

DM32/DM33 Operation Oct 14

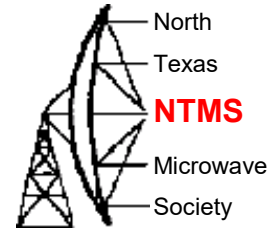


24 GHz
12" dish

76/78 GHz
12" dish

76/78 GHz rig mounts to tripod
Either 24, 47, or 122GHz mounts on an aluminum plate on top of the 76 GHz rig
DM32xx91ix and DM33xa90ia

DM43 Operation Oct 14

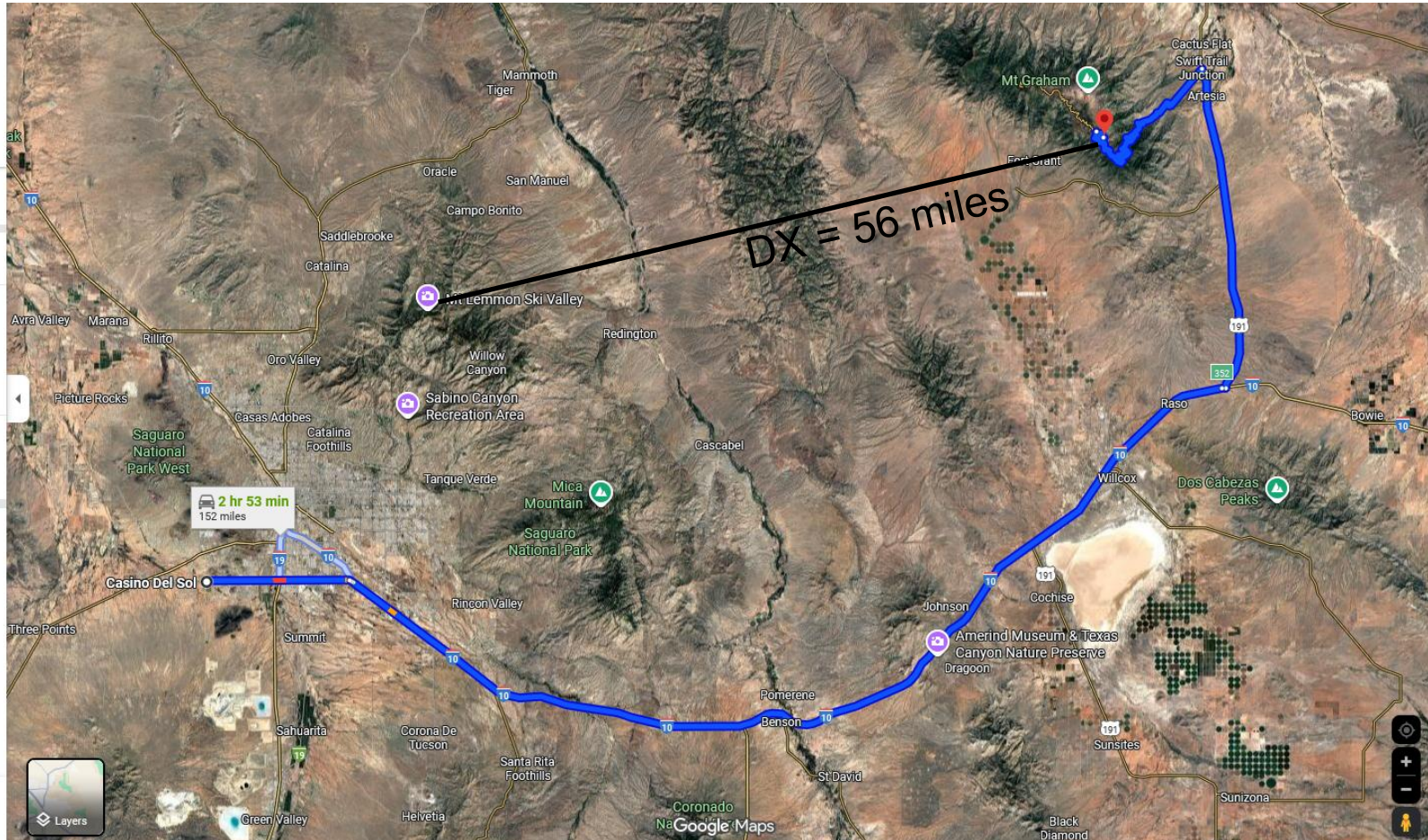
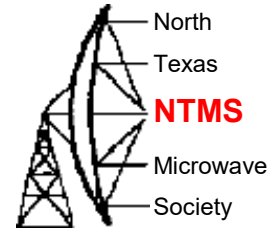


DX to Mt. Lemon 128 km



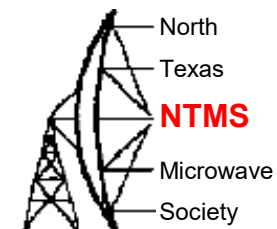
View towards Mt. Lemmon

Casino Del Sol to Heliograph Peak DM52 on Oct 15



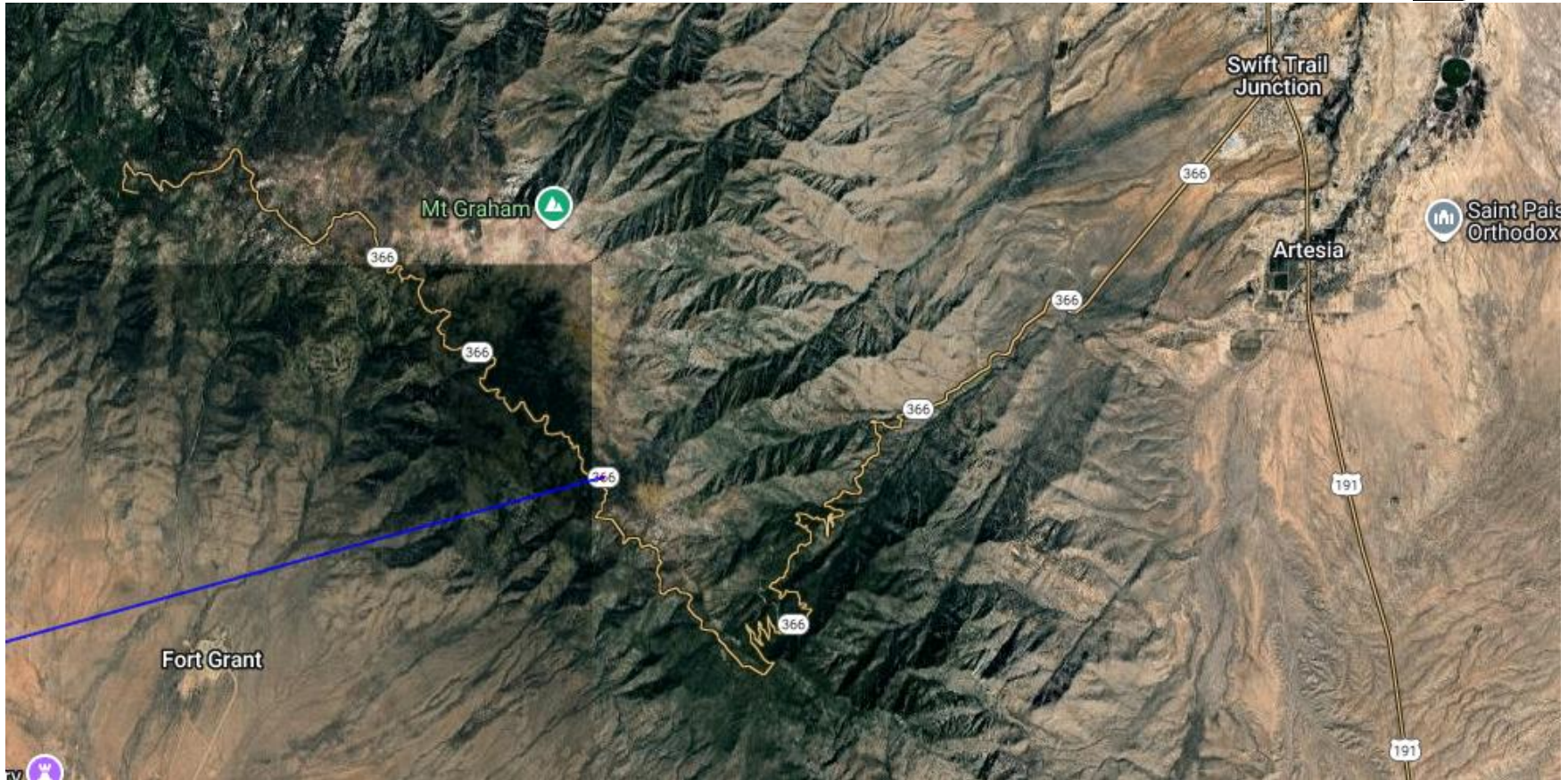
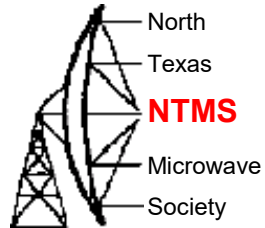
Road trip with Jim N9JIM - 152 miles and 3 hours

How did Heliograph Peak get its name?



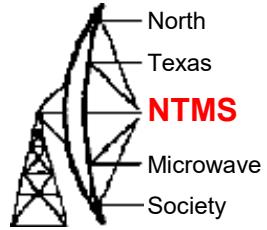
- Heliograph Peak was named because the US Army used the location as a heliograph station in the 1860s to send messages using flashes of reflected sunlight. The name comes from the word "heliograph," which itself is derived from the Greek words for "sun" (\(hēlios\)) and "to write" (\(graphein\)), referring to the sun-signaling method of communication.
- Present day the peak has numerous trails that attract many visitors and hikers.

Final Journey to DM52 on AZ 366



The final drive from Swift Trail Junction was about 20 miles and took about an hour
Notice the switch backs!

DM52bp67qm to Mt.Lemon



47 GHz

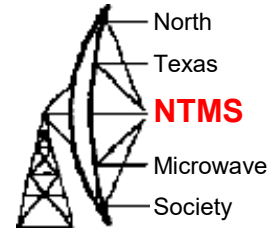
78 GHz



47 GHz

78 GHz

Close Up from Heliograph Peak to Mt. Lemmon

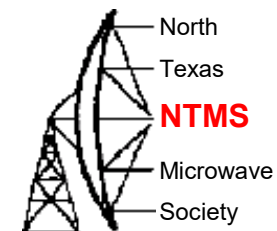


DX = 56 miles

Heliograph Pk
at ~ 9000 + ft

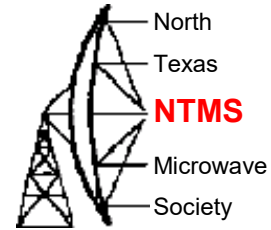
Mt. Lemmon
at ~ 8400 ft

After Day 2



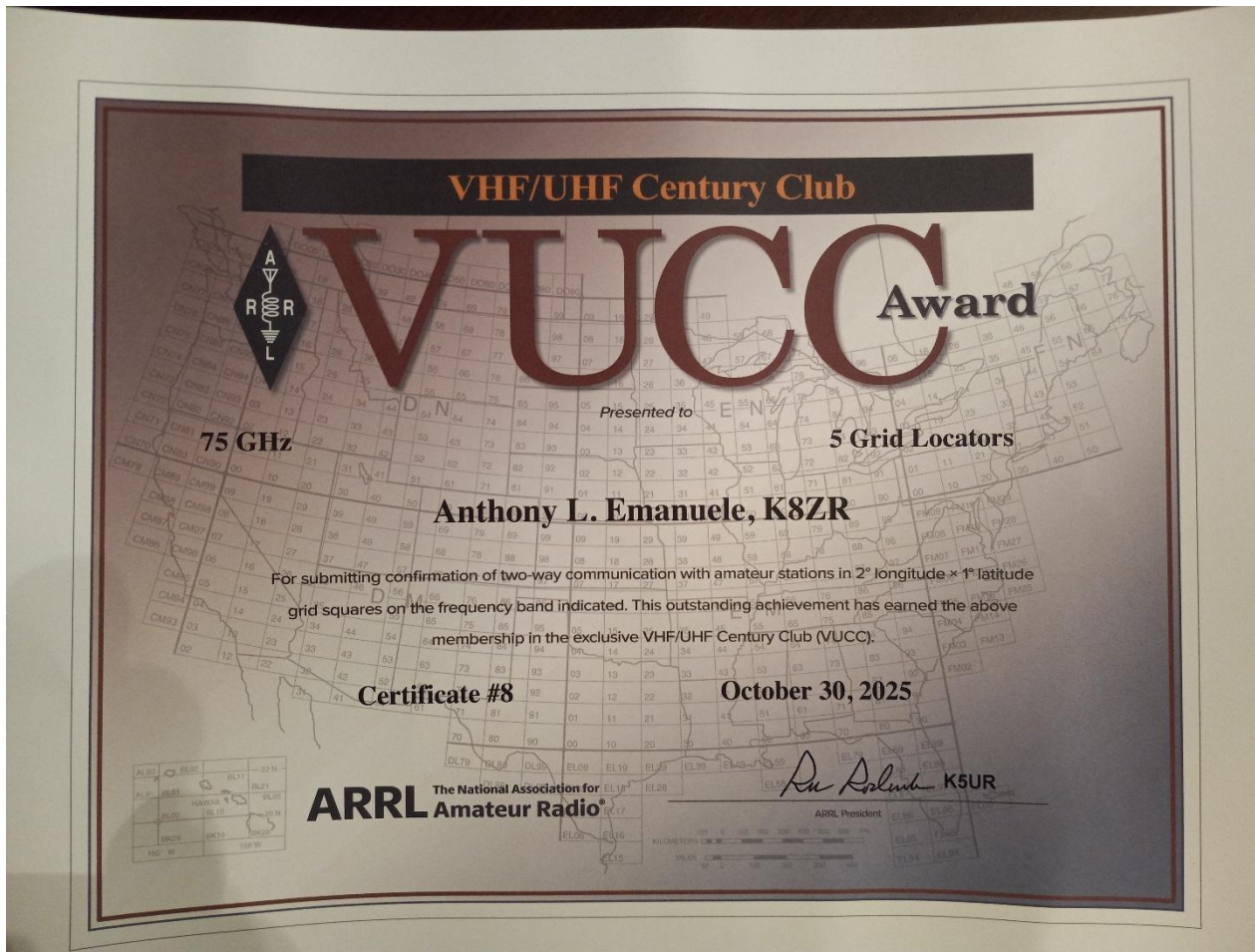
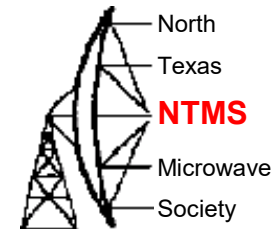
- After two days of operation, DM32, DM33, DM43, and DM52 were activated on 24, 47, and 78 GHz.
- I assumed everyone on Mt. Lemon in DM42 worked each other for grid #5.
- But that was only the case on 24 and 47 GHz.
- Tony K8ZR was the only station on 78 GHz at Mt. Lemon.
- So.. on Day 3, Tony and I head up to Mt. Lemon to give Tony grid #5 on 78 GHz

Stations worked on Mt. Lemon in DM42ok

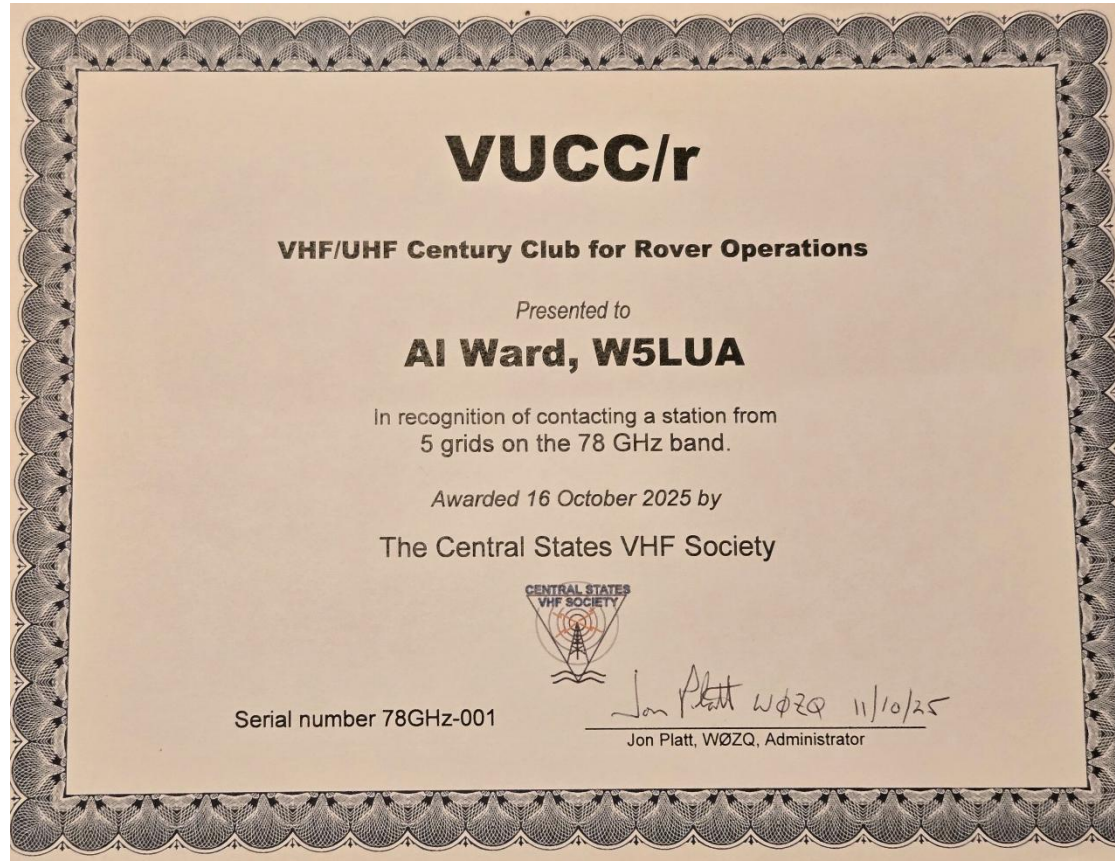
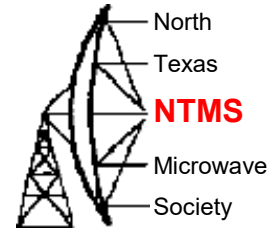


- Oct 14 DM32 – 78 GHz K8ZR, 47 GHz KM5PO, KB6BA, K8ZR, W6BY, 24 GHz KM5PO, K8ZR, KD6W, KB6BA, W6BY
- Oct 14 DM33 – 78 GHz K8ZR, 47 GHz KM5PO, K8ZR, KB6BA, W6BY, 24 GHz K8ZR, KD6W, W6BY, KB6BA, KM5PO
- Oct 14 DM43 – 78 GHz K8ZR, 47 GHz KM5PO, K8ZR, W6BY, KB6BA, 24 GHz K8ZR, KM5PO, W6BY, KB6BA, KD6W
- Oct 15 DM52 – 78 GHz K8ZR, 47 GHz KM5PO, K8ZR, KB6BA, AA6PZ, 24 GHz KD6W, KB6BA, KM5PO, K8ZR, AA6PZ
- Oct 16 DM42 – 78 GHz K8ZR
- Total number of stations worked = 41 from 5 grids!
- K8ZR achieved VUCC on 78 GHz
- I achieved the first CSVHFS reverse VUCC for 78 GHz
- It was fun! I am ready for the next rover trip!

K8ZR Receives VUCC #8

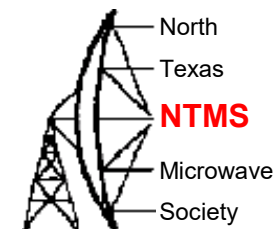


First Reverse VUCC on 78 GHz



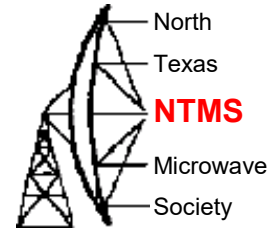
Awarded to an amateur who has worked a single station from 5 different grids
Sponsored by the Central States VHF Society, www.csvhfs.org

W5LUA Equipment



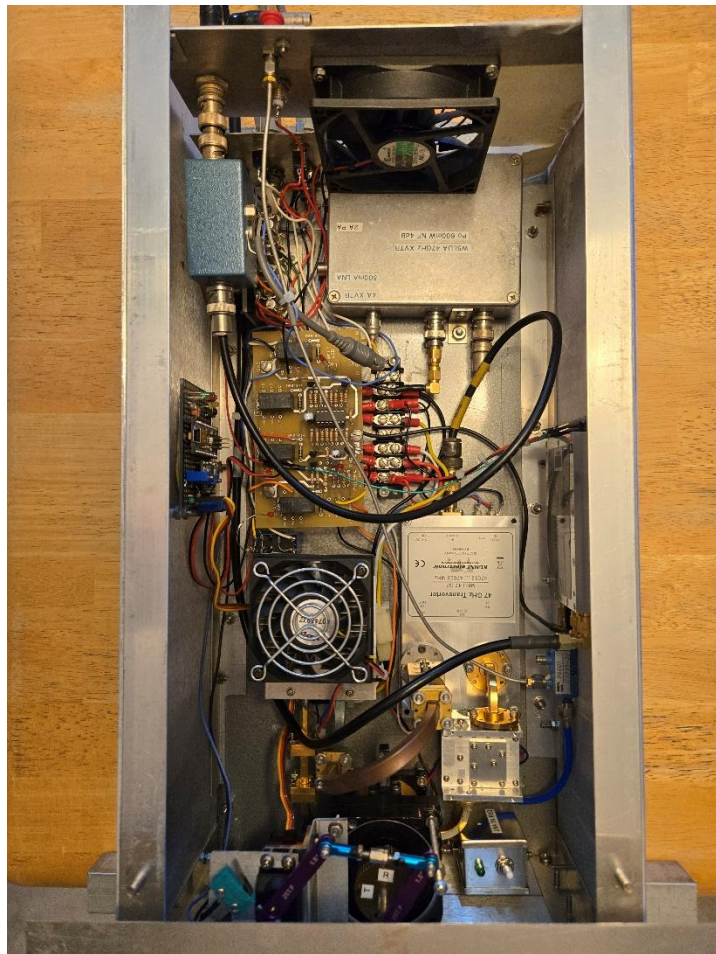
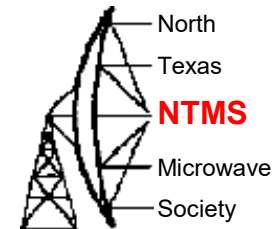
- 24 GHz – HB xvtr with ZL PLL, Avantek LNA, W2PED 1 watt PA, 12 inch dish
- 47 GHz – Kuhne MKU LO 8-13 PLL-2, MKU 47 G2 xvtr, PA .5 watt, JA8CMY LNA, 12 inch dish
- 76/77/78 GHz – Kuhne MKU LO 8-13 PLL-2, MKU 76 G2 xvtr 10 mW, WA1MBA LNA, 12 inch dish (45 dBi?)
- Part 97 rules state. (m) No station may transmit with a peak equivalent isotropically radiated power (EIRP) exceeding 316 W in the 76-81 GHz (4 mm) band.
- All equipment GPS locked either with a Trimble or Bodnar ref.
- IF Rig Electcraft KX3/PX3
- Liaison – Cell phone and NTMS Slack

KX3 PX3 as 10 m IF



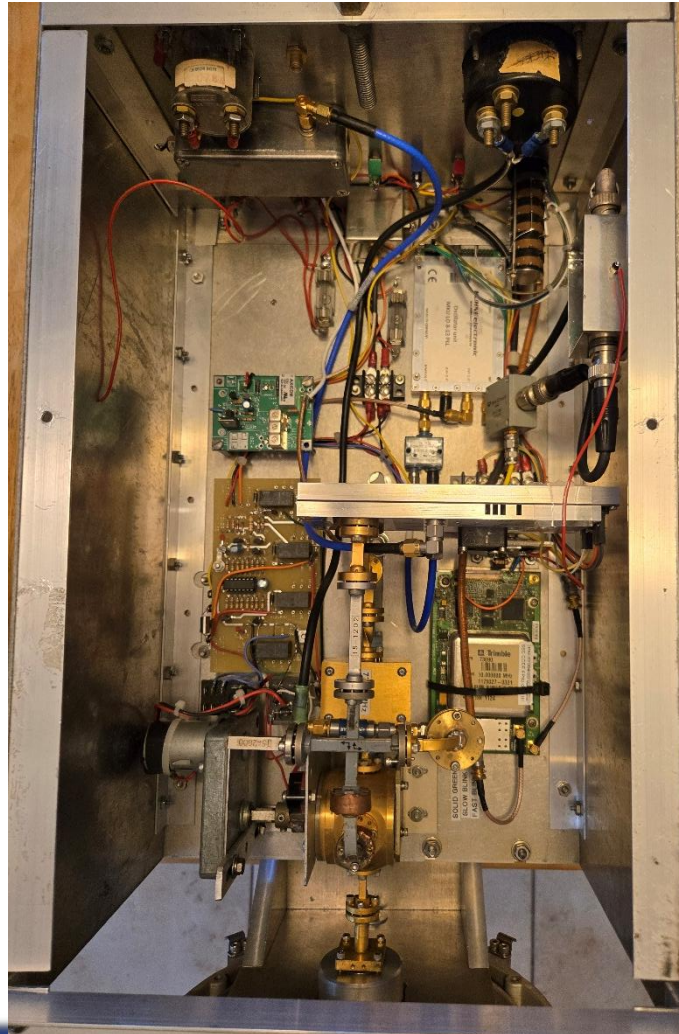
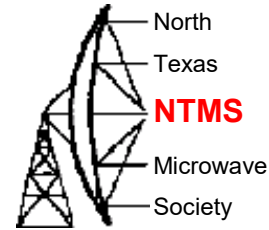
External box attenuates 1W at 10 m down to 10 mW for XVTRs

47.088 GHz Transverter



12 in Dish provides 40 dBi gain and 3 dB beamwidth of 1.5 deg at 47 GHz

76.032 / 78.192 GHz Transverter

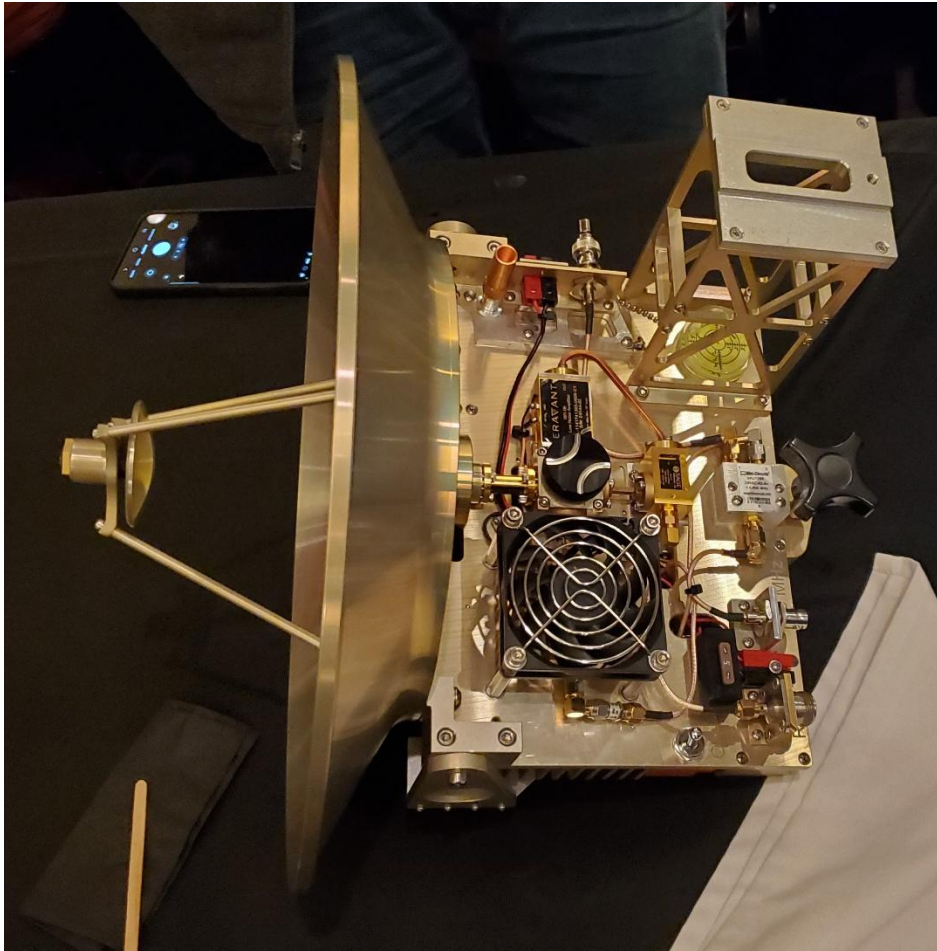
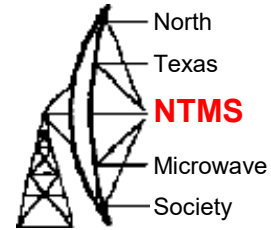


Control Panel



12 in Dish provides
45 dBi gain and 3
dB beamwidth of
.9 deg at 47 GHz

N0IO 122 & 134 GHz Rig



VE6BGT Photo

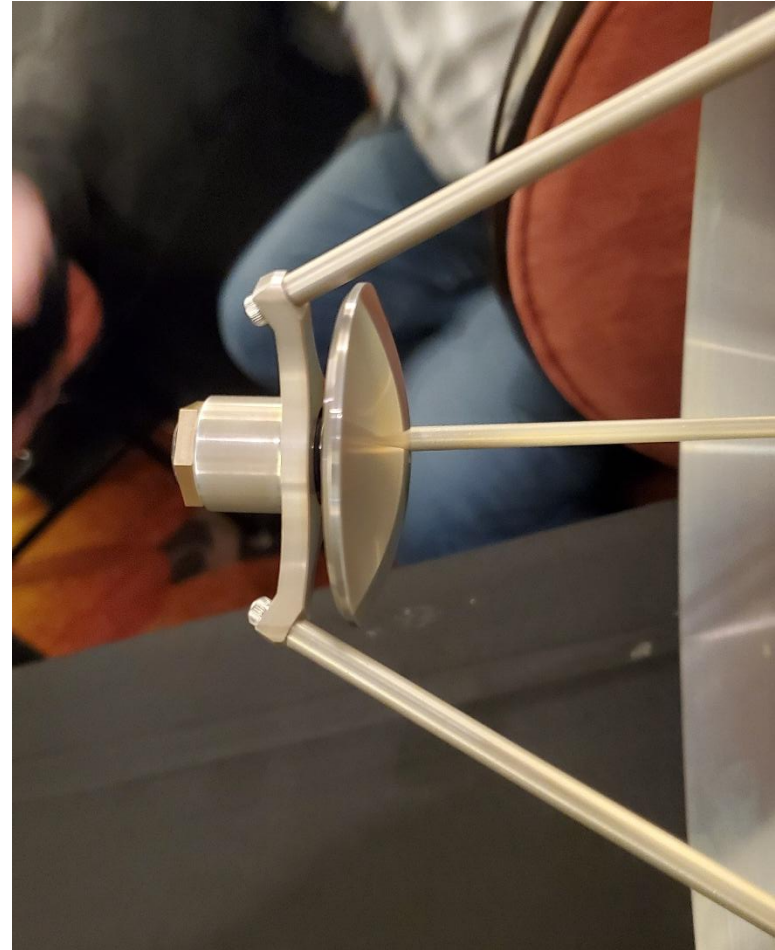
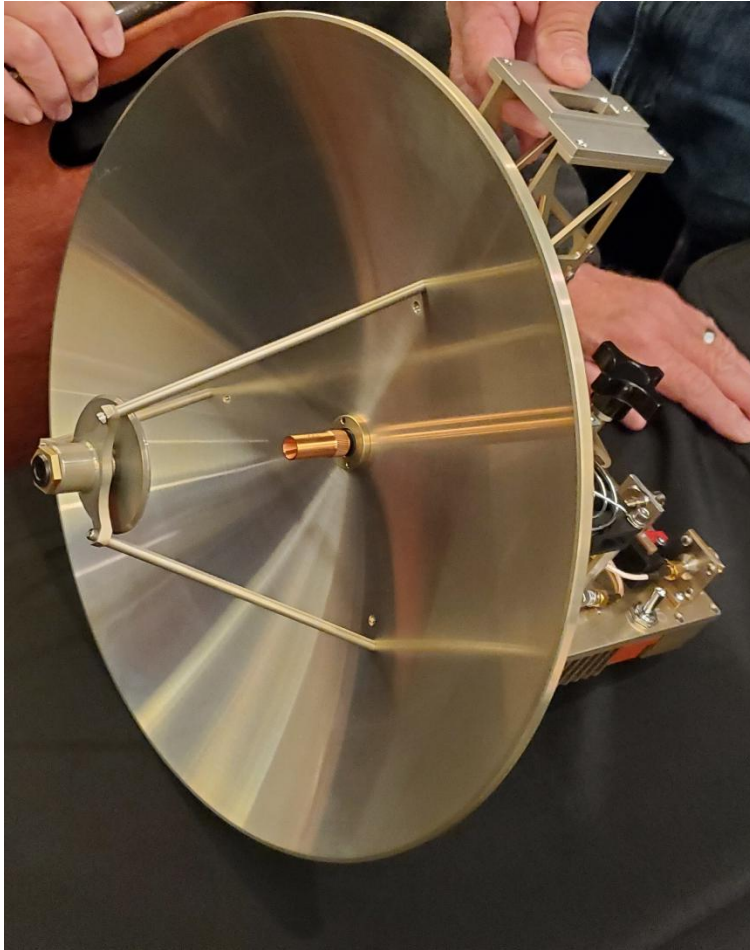
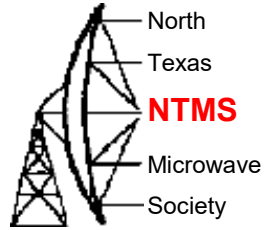
Mark machined his own 350 mm (13.8 inch) dish and sub-reflector

The stand is for mounting his 10 GHz liaison / pointing radio

More details in the next couple of slides

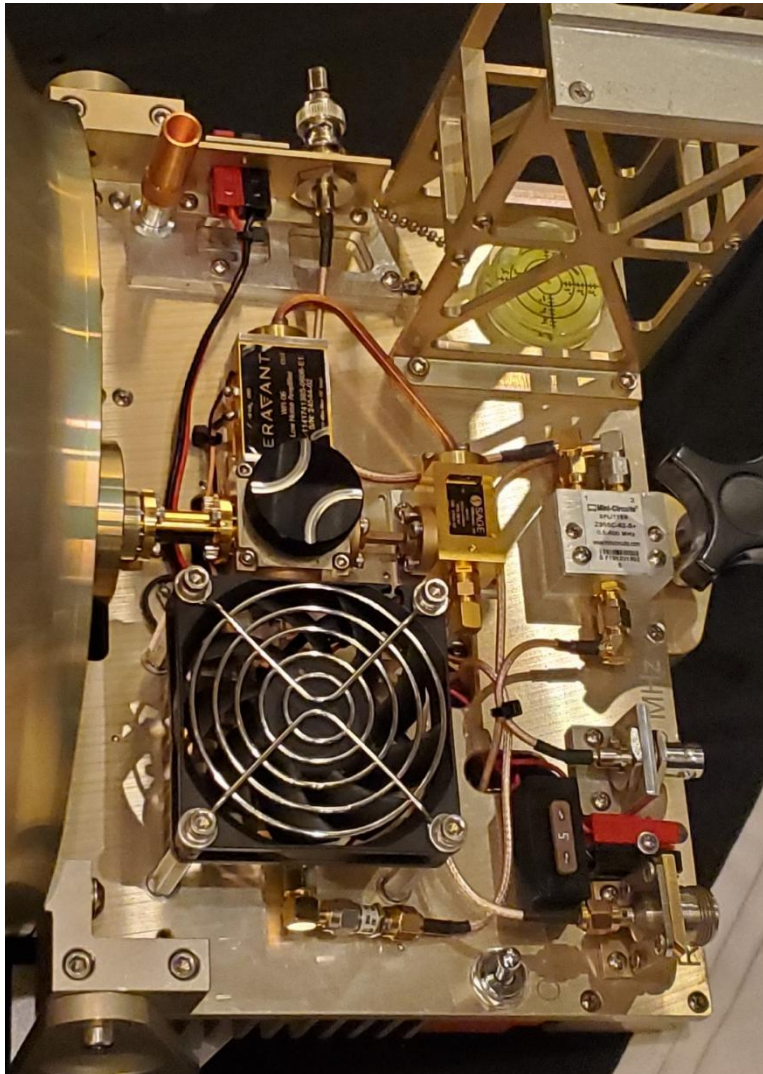
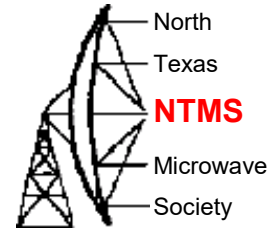
Mark attempted the 207 km White Tanks to Mt. Lemmon with no success – moisture too high

Dish Feed Subreflector



VE6BGT Photos

N0IO 122 & 134 GHz Rig



Eravant 5 dB NF LNA, provides about a 7 dB system noise figure

Under the fan is an Eravant X12 multiplier providing about 12 mW on xmit and 13 mW as an LO on receive. It is driven by a Kuhne MKU LO

Xmit = 10249 MHz X 12 = 122988 MHz

Rcve = 9961 MHz X 12 = 119532 MHz plus
3456 MHz IF = 122988 MHz

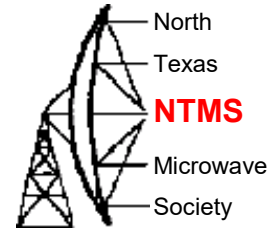
Mixer is Sage/Eravant

The second feed is for 134 GHz

Mark noticed several dB improvement in signal strength from 122 to 134 GHz

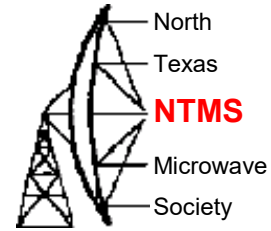
Best DX so far 110 km

“Peakfinder”



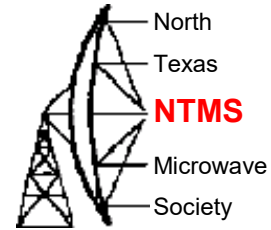
- While on Mt. Heliograph in DM52, Jim N9JIM introduced me to an app for my Android called PeakFinder. Also available on Iphone.
- Identifies peaks
- I will have it for next time
- Could not find any peaks around EM13qc!

A few web sites to check out



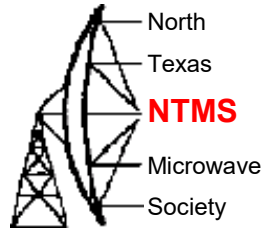
- Down East Microwave, <https://www.downtownmicrowave.com/>
- Q5 Signal, <http://www.q5signal.com/>
- Kuhne Electronic,
<https://shop.kuhne-electronic.com/kuhne/en/>
- Directive Systems,
<https://directivesystems.com/>
- W6PQL, <https://www.w6pql.com/>
- KA1GT, <http://bobatkings.com/radio/>
- W1GHZ, <http://www.w1ghz.org/>
- OK1DFC, <https://www.ok1dfc.com/>

Additional Information



- www.ntms.org reflector
- NTMS groups.io slack page used for local coordination and chat, email request to Brad WQ5S southpaw1959@gmail.com
- microwave-request@mailmanlists.us
- 10GHz-Up@groups.io
- Midwest-Microwave@groups.io
- Moon-Net@Groups.IO

Summary



- As usual one always gets fired up on these events
- I look forward to a few more mountain top adventures
- Thanks to my wife Emily for accompanying me on the trip.
- Total trip 3000 + miles
- Questions?
- W5lua at sbcglobal.net
- Thanks for attending