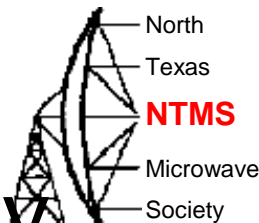


Welcome to The North Texas Microwave Society



Cowtown Jan 16, 2016

Bob Gormley WA5YWC

Al Ward W5LUA

- The North Texas Microwave Society meets monthly in the DFW area and is dedicated to weak signal communication at 902 MHz and higher frequencies with an emphasis on 10 GHz. We will discuss equipment and antenna construction as well as propagation and on the air operating events. We will also discuss the extensive system of microwave beacons that are used to checkout equipment and monitor band conditions.
- Question and Answer

The North Texas Microwave Society was formed in 1986



**Dedicated to Promoting Activity, the
State of the Art in Equipment Design,
and
the Exchange of Ideas and Technology
for the Amateur Bands Above 902 MHz**



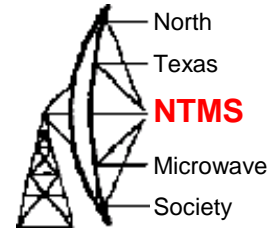
**President – Bob Gormley WA5YWC
Vice President – Al Ward W5LUA
Secretary – Eric Haskell, KC4YOE
Treasurer - Wes Atchison, WA5TKU**



NTMS web page www.ntms.org



NTMS Yahoo Group



YAHOO! GROUPS Search Conversations Search Groups Search Web AI 99+ Mail

North Texas Microwave Society
Restricted Group, 15 members

Conversations Photos Files **About** More

About Group [+ Join Group](#)

8 messages added in the last 7 days

Group Description
Email reflector for the North Texas Microwave Society (NTMS). Dedicated to promoting activity, the state of the art in equipment design, and the exchange of ideas and technology for the amateur bands above 902MHz.

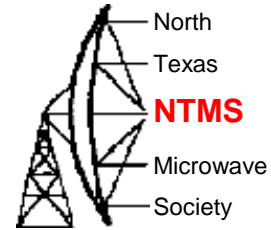
Group Website

ACTEMRA *tocilizumab* For moderate to severe RA
WOULD HAVE. DID.
Ami asked her doctor about Actemra
[CLICK HERE to learn more](#)

Scroll for Important Safety Information
anti-inflammatory drugs (NSAIDs), corticosteroids, or methotrexate.
Tell your doctor right away if you see any of these side effects: fever, stomach-area pain that does not go away, or if you see a change in your bowel habits.
Changes in blood test results

Windows Taskbar: Internet Explorer, Firefox, Chrome, VLC, File Explorer, Desktop, OneDrive, Skype, Outlook, PowerPoint, Windows Start, Network, Volume, Battery, Time, System Tray

Band Allocations



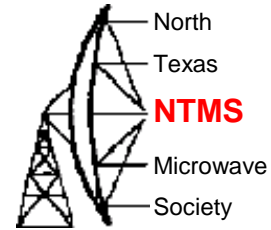
- 902-928 MHz
- 1240-1300 MHz
- 2300-2310 MHz
- 2390-2450 MHz
- 3300-3500 MHz
- 5650-5925 MHz
- 10.0-10.5 GHz
- 24.0-24.25 GHz
- 47.0-47.2 GHz
- 77-77.5 and 78.0-81.0 GHz
- 119.98-120.02 GHz
- 142-149 GHz
- 241-250 GHz
- All above 300 GHz

Over 22,000 MHz of Spectrum!

In contrast, the entire HF band covers 30 MHz (Ham allocation: 3.75 MHz)

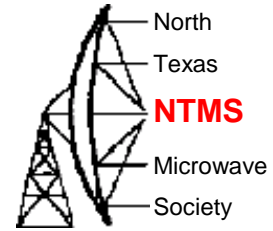
The VHF/UHF allocations cover 41 MHz

2016 NTMS Activities

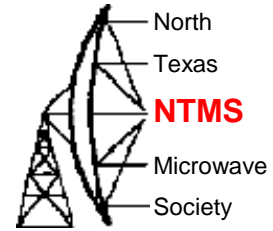


- Monthly meetings at St. Barnabas Presbyterian Church, Richardson
- Technical presentations at most meetings
- Tune-up parties
- Antenna range
- Building equipment
- Contesting
- Social events

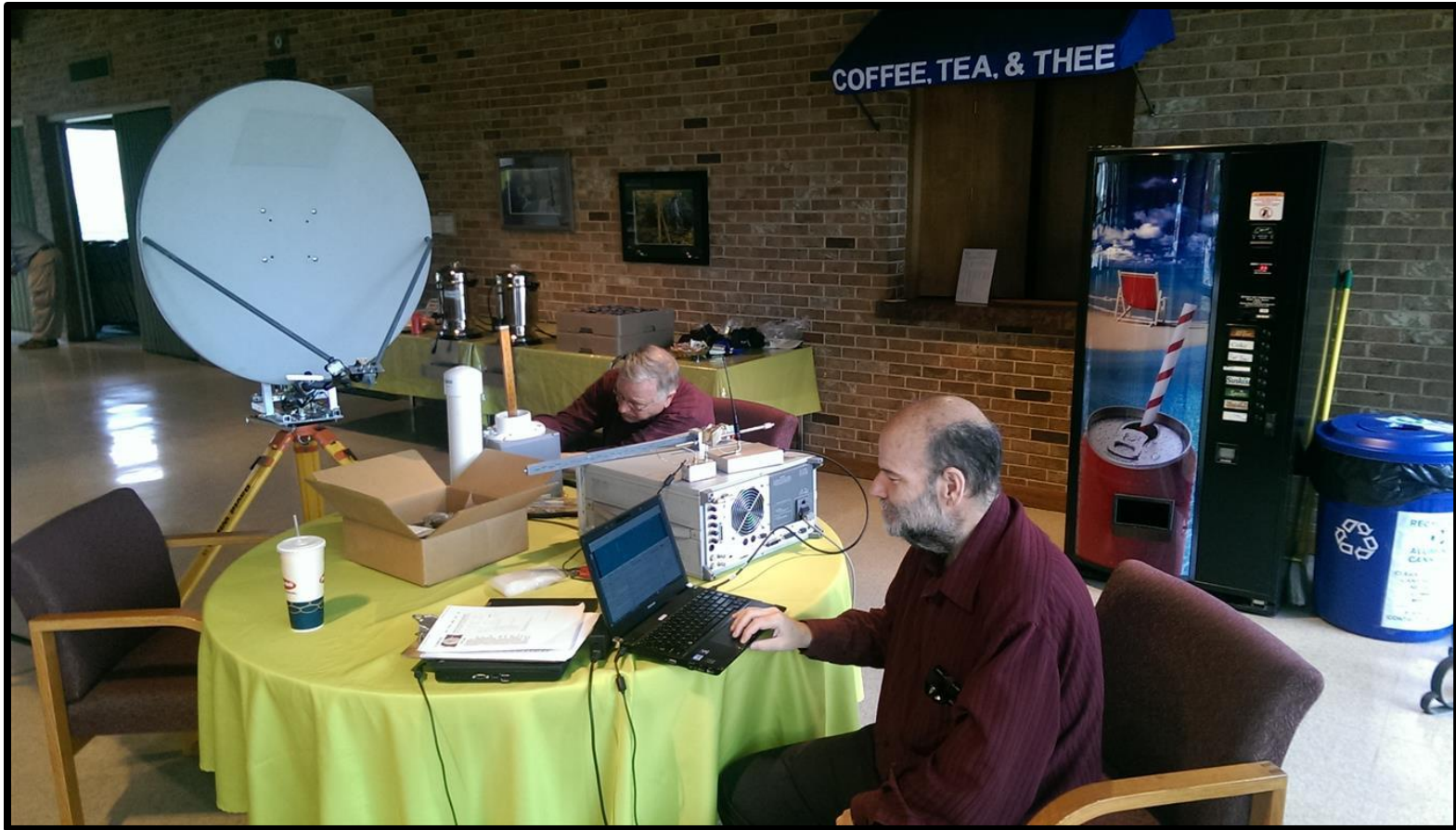
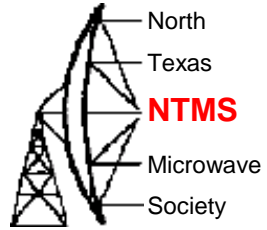
May 2015 Meeting and Tune-up Party at N5BRG's QTH



Burgers and Tune-up at WA5YWC July 2015



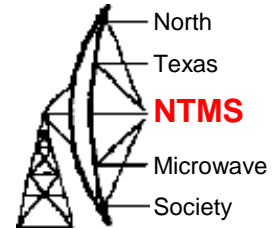
November 2015 Equipment Tune-up Party



Al, W5LUA

Eric, KC4YOE

10 GHz Antenna Range



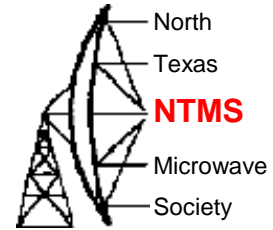
**St. Barnabas Church
parking lot antenna range.**

Kent, WA5VJB and Jim, WA5JAT

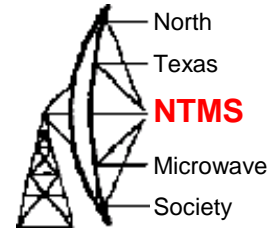


Jim, KOMHC and Jim, WA5JAT

Parts Give-away thanks to Kent, WA5VJB



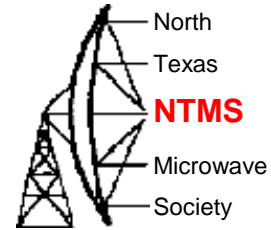
NTMS Beacons



Frequency MHz	Call	Grid	QTH	Power Output	Modulation	Antenna	Height Above Ground	Status
50.072.7	W5HN	EM13sj	Desert, TX	1W	CW	M2 Halo	180 ft	ON THE AIR
144.280.5	W5HN	EM13sj	Desert, TX	2W	CW	M2 Halo	180 ft	ON THE AIR
222.059	AA5C	EM13se	Princeton, TX	8W	CW	Folded Dipole	45 ft	ON THE AIR
432.379.7	W5HN	EM13kf	Denton, TX	0.5W		Loop	280 ft	ON THE AIR
432.370	N5PYK	DM93bm	Lubbock, TX	4W	CW	6 el Yagi > DFW	70 ft	ON THE AIR
902.371	W5HN	EM13kf	Denton, TX	10W	FSK	Alford Slot	280 ft	ON THE AIR
1296.346	W5HN	EM13kf	Denton, TX	3.5W	FSK	Alford Slot	280 ft	ON THE AIR
2304.375	W5HN	EM13kf	Denton, TX	4W	FSK	Alford Slot	280 ft	ON THE AIR
3456.373	W5HN	EM13kf	Denton, TX	0.3W	FSK	Alford Slot	280 ft	ON THE AIR
5760.366	W5HN	EM13kf	Denton, TX	0.2W	FSK	6 Slots in WR-137	280 ft	ON THE AIR
10368.372	W5HN	EM13kf	Denton, TX	0.2W	FSK	8 Slots in WR-90	280 ft	ON THE AIR
24192.353	AA5C	EM13se	NE of Princeton, TX	0.5W	CW	Alford Slot		ON THE AIR

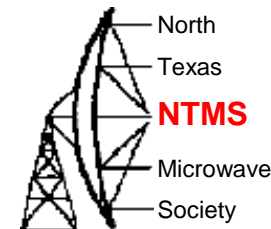
Note: Frequencies vary with temperature

Roving on 10 GHz

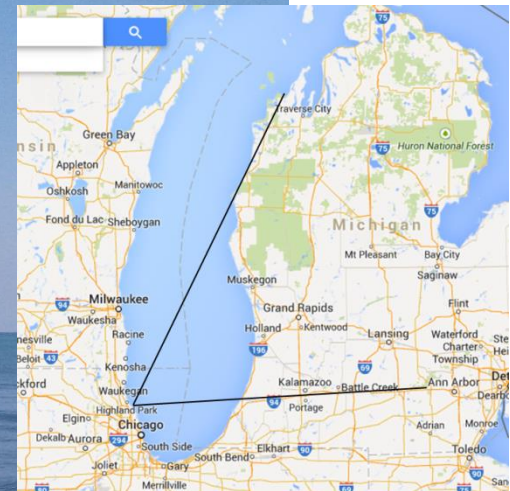
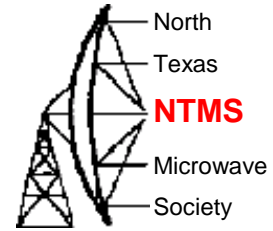


- ARRL 10 GHz and Up Contests
- ARRL VHF Contests
- NTMS Cumulative Contest
- Challenge of setting up a portable setup and aiming the antenna – a 2 ft dish has a gain of 27 dBi and a 3 dB beamwidth of 3 to 4 degrees!

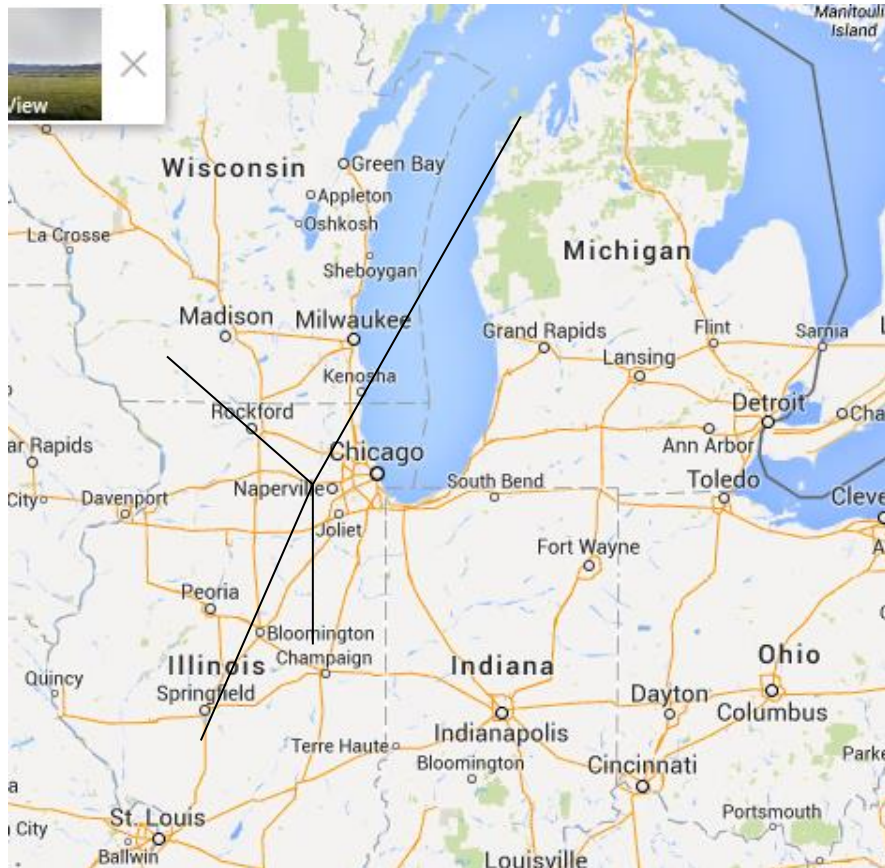
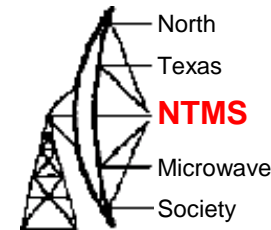
DM70xo to DM81rs across the mountains – 120 miles on 10 GHz



View to EN74 from EN62ce Highland Park, Illinois 8/16/2014



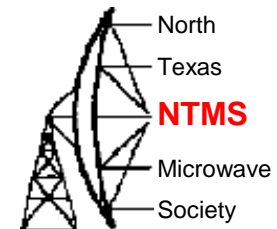
EN51xr DuPage County Green Valley Forest Preserve 8/16/2014



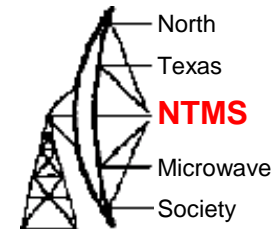
Time	Call	My grid	DX Grid	Band	DX(km)
12:05PM	W9SNR	EN51xr	EN62cc	10 GHz	47
12:56 PM	W9ZIH	EN51xr	EN51nv	10 GHz	72
1:03 PM	K2YAZ	EN51xr	EN64vm	10 GHz	344
1:04 PM	W9NU	EN51xr	EN64vm	10 GHz	344
2:15 PM	W9SZ	EN51xr	EN50xf	10 GHz	167
2:35 PM	K00Z	EN51xr	EM59ji	10 GHz	282
3:04 PM	W9FZ	EN51xr	EN52dt	10 GHz	183
3:06 PM	KA9VVQ	EN51xr	EN52dt	10 GHz	183
4:05 PM	W9SNR	EN51xr	EN51xr	24 GHz	1
4:06 PM	W9SNR	EN51xr	EN51xr	10 GHz	1



W5RLG



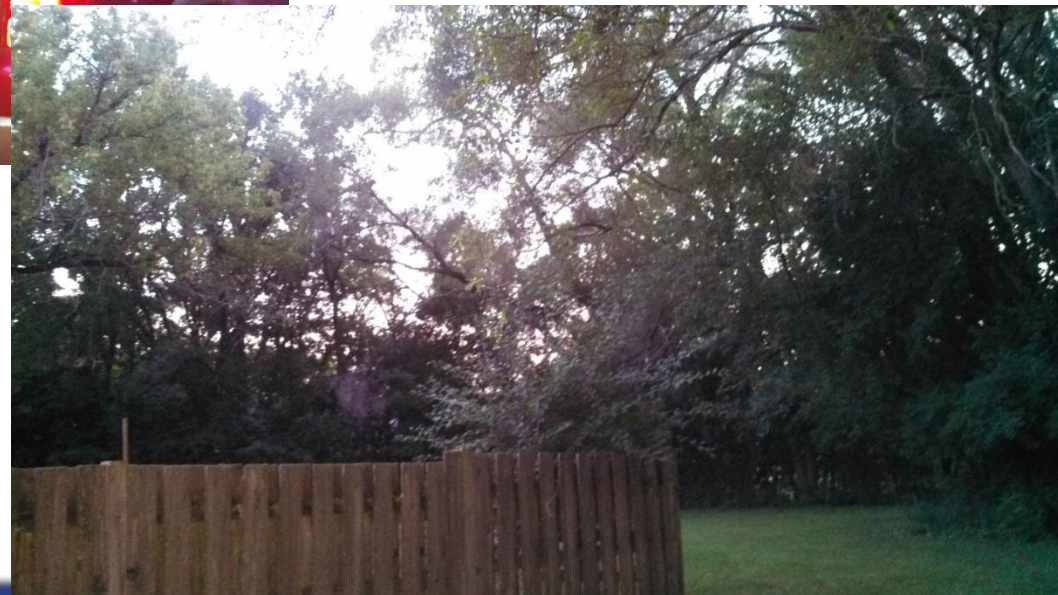
EN52wf Driveway at my mom's place – Barrington, Ill



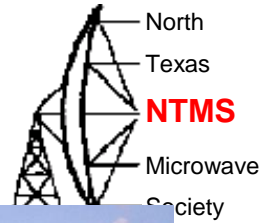
DX = 72 km

View towards W9ZIH EN51nv

Only contact made on 8/17/2014



W5LUA and N5QGH in EL28hv

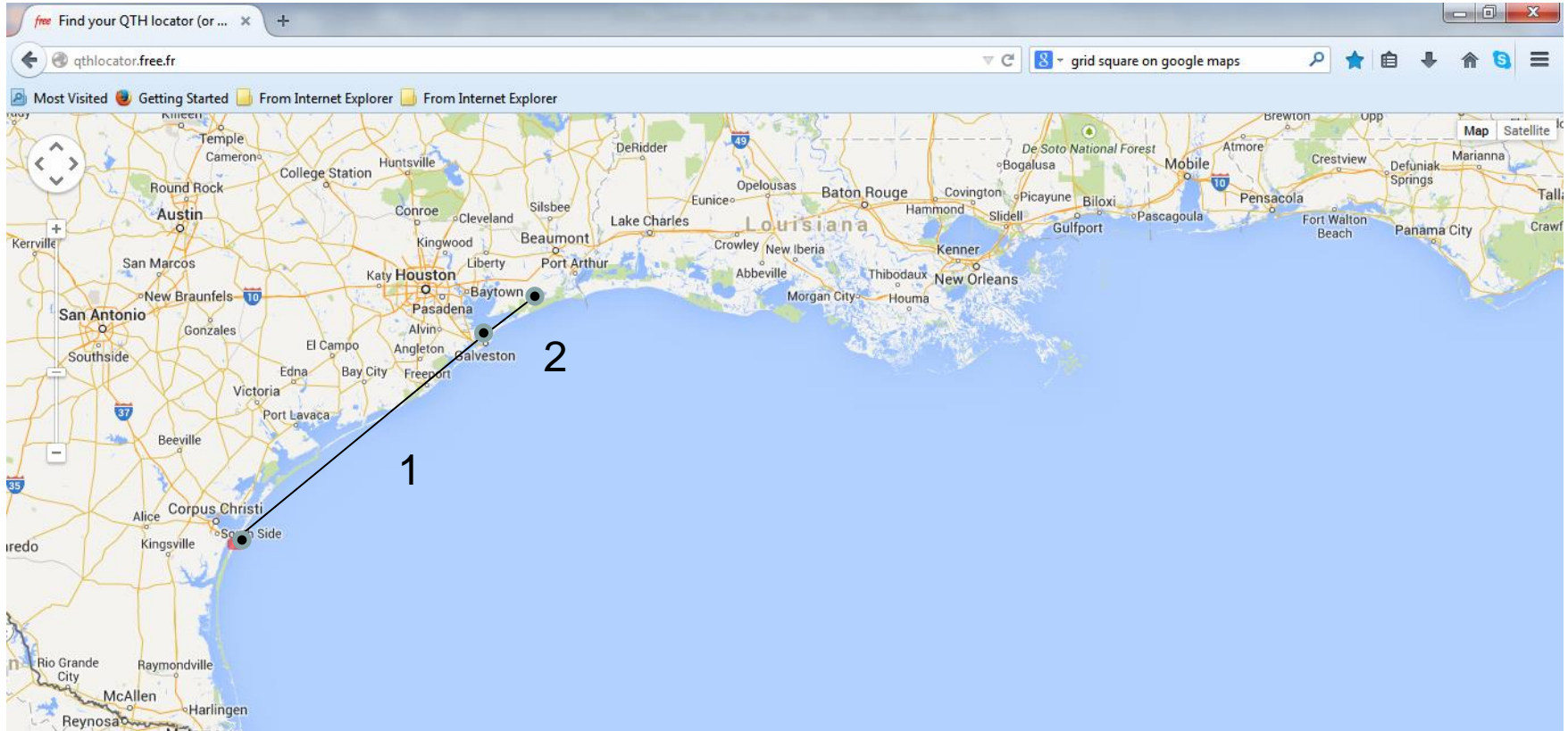


Flex-1500, DEMI xvtr and 25 watt TWT and 27 dBi 2 ft Dish Antenna – Best DX 180 miles



IC-271A, HB 3 watt Transverter and 15 dBi Horn Antenna – Best DX 180 miles

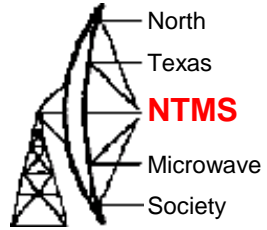
Paths on the Gulf Coast



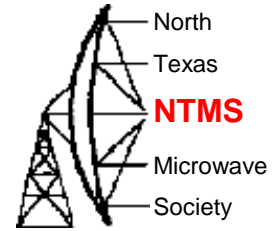
1 Path to WA5YWC in EL17jo DX = 291 km (180 miles)

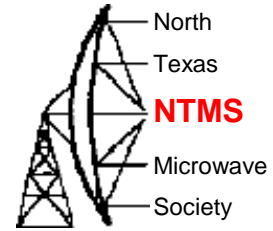
2 Path to WA8RJF in EL29tn DX = 61 km (38 miles)

K5GJ and KN5D in EL28hv



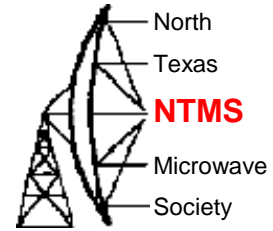
WA5YWC in EL28hv



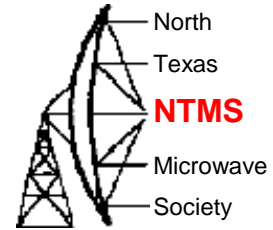


New Stations on 10 GHz this year

N5BRG operated from EM13mj and EM13il

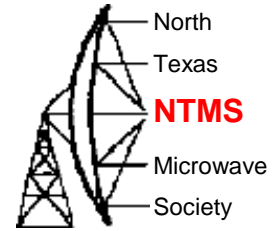


AA5AM 10 GHz Success



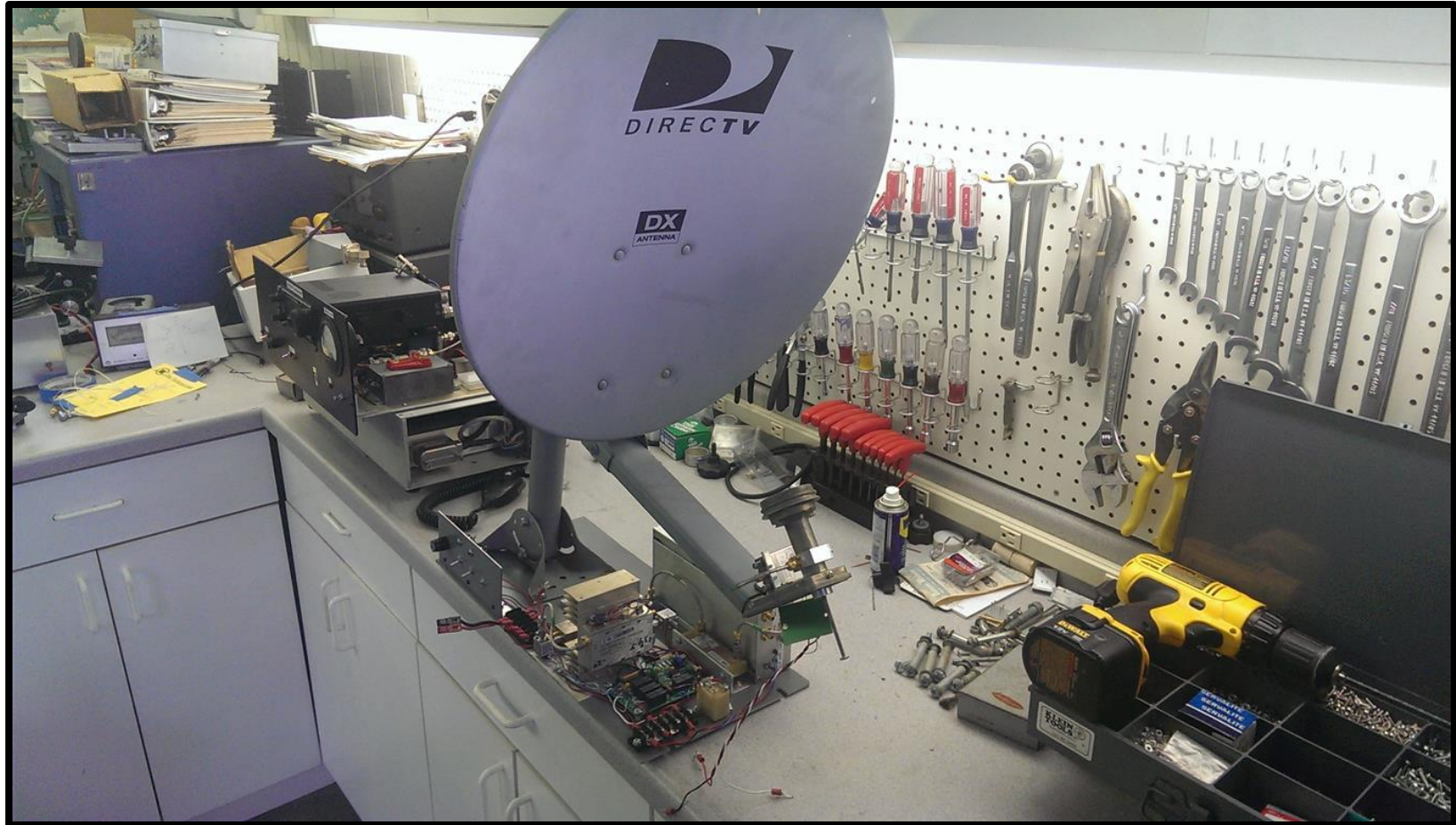
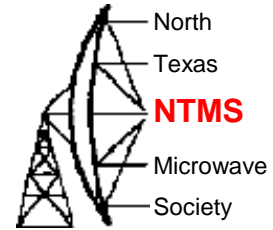
Double Balanced Mixer and 8 inch
offset fed dish
W5LUA worked at 13 miles
Scott also heard W5RLG at 68 miles
And N5WCO at 56 miles
It is a start!

K5TRA's Attic 10 GHz Antenna



W5LUA worked
K5TRA on 10 GHz
at a distance of
over 200 miles

Building Microwave Equipment



You Find an Offset Dish Antenna What next?



The first question is: will it work on 10 GHz?

YES it will!

Where's the focus and what kind of feed do I need?

Offset Dish Antennas

Oval Shaped



Single LNB feed

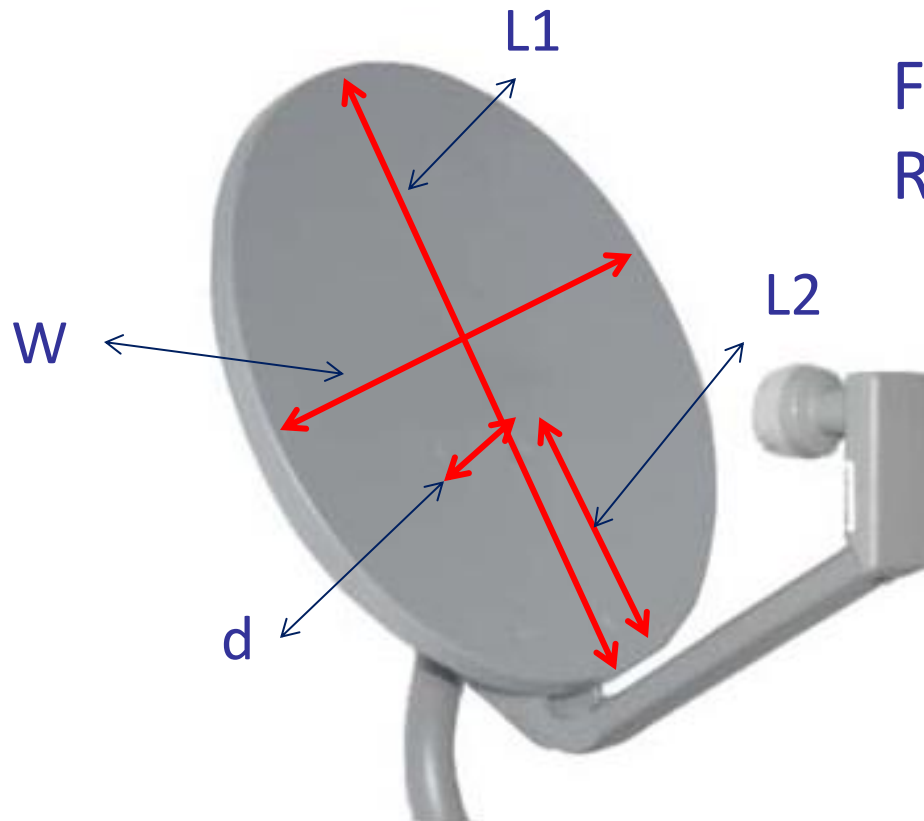
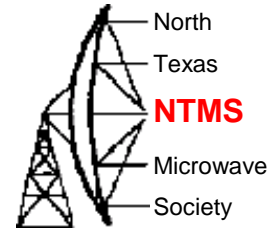
Oblong Shaped



Multiple LNB feeds

Both antennas work on 10 GHz

Measuring for Focus on an Oval Dish



(Assume LNB not present)

Four Measurements Required

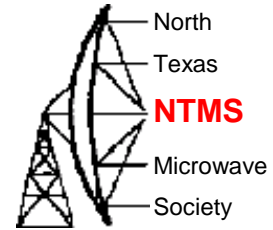
L1: Length

W: Width

d: Depth

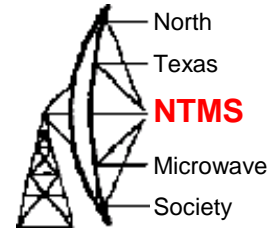
L2: Length to
bottom rim
from depth

Find Them and Use Them



Offset dish antennas are everywhere.
When you see a discarded dish, grab it!

Offset Dish Calculator



Wifi Calculations for Parabolic Dish with Offset Feedhorn

Inputs

Enter Frequency MHz

Diameter of large axis of dish mm

Diameter of small axis of dish mm

Depth of dish at deepest pt mm

Distance of deepest pt from bottom edge along large axis mm

Units (all entries) inches mm

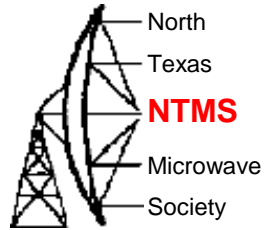
This program does calculations for oval-shaped offset-fed parabolic reflectors. This routine uses a curve-fitting algorithm to find the focal point and tilt angle for aiming the dish.

Required input data are the dimensions of the large and small axis of the oval, and the depth and location of the deepest point in the reflector, measured along a straightedge placed across the rim on the large axis.

The WiFi calculations and output text are copied directly from the source code of the hdl_ant program written by Paul Wade, you can find the program here:
<http://www.wtghz.org/10g/software.htm>

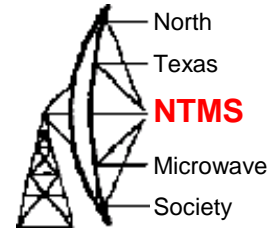
(there is a link to the program on the "About" form

<http://www.electroniccircuits.com/electronic-software/parabola-calculator-for-satellite-dish-antenna-design>

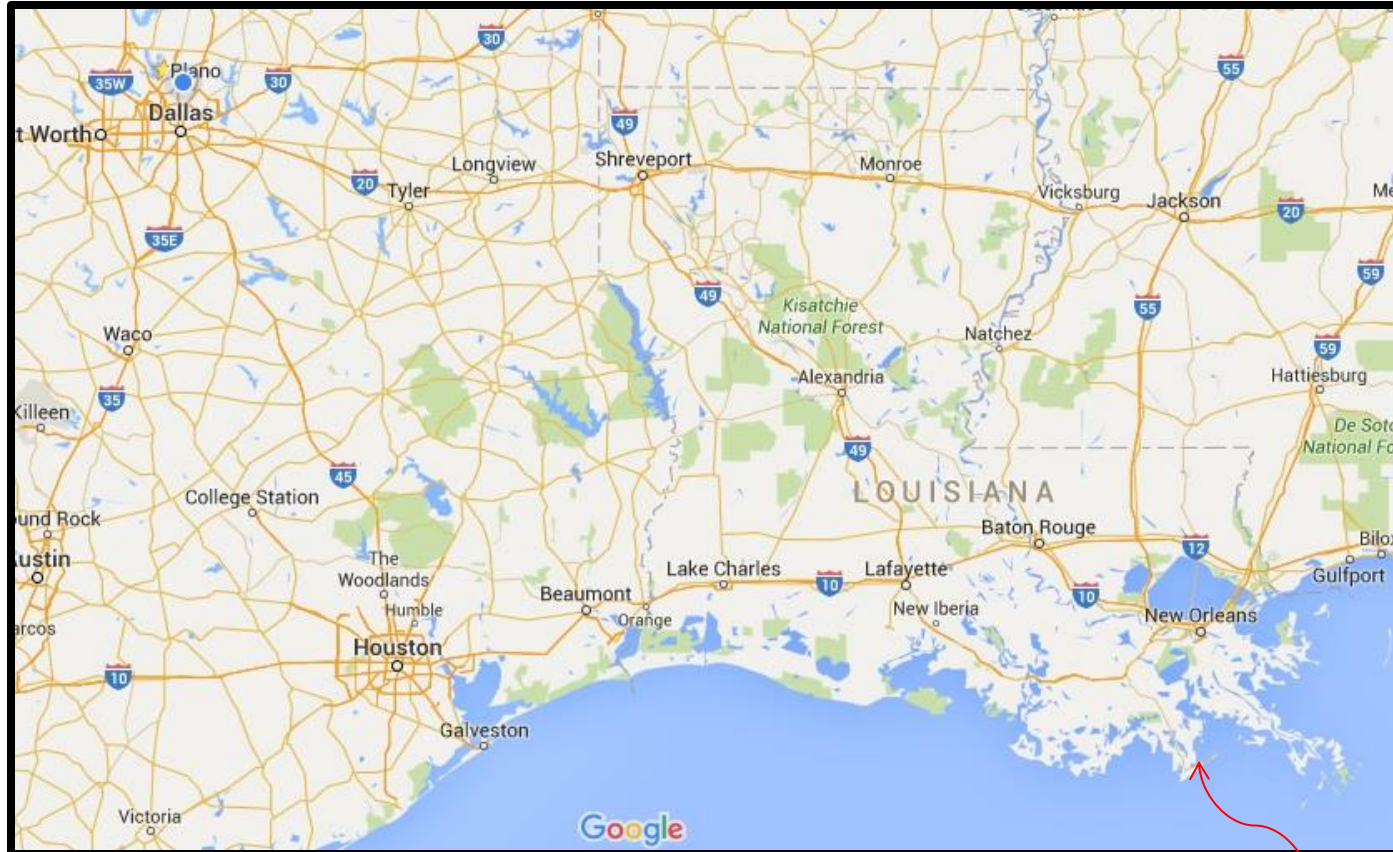


September 2015 10 GHz Contest

- Work as many stations possible from Grand Isle, LA in EL49xf.
- Observe band conditions across the Gulf of Mexico towards Florida.
- Make rovers the priority.

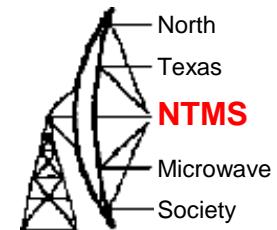


Where is Grand Isle, LA?

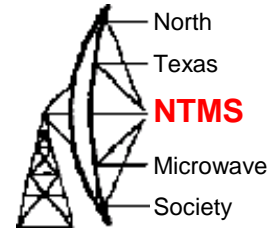


Here

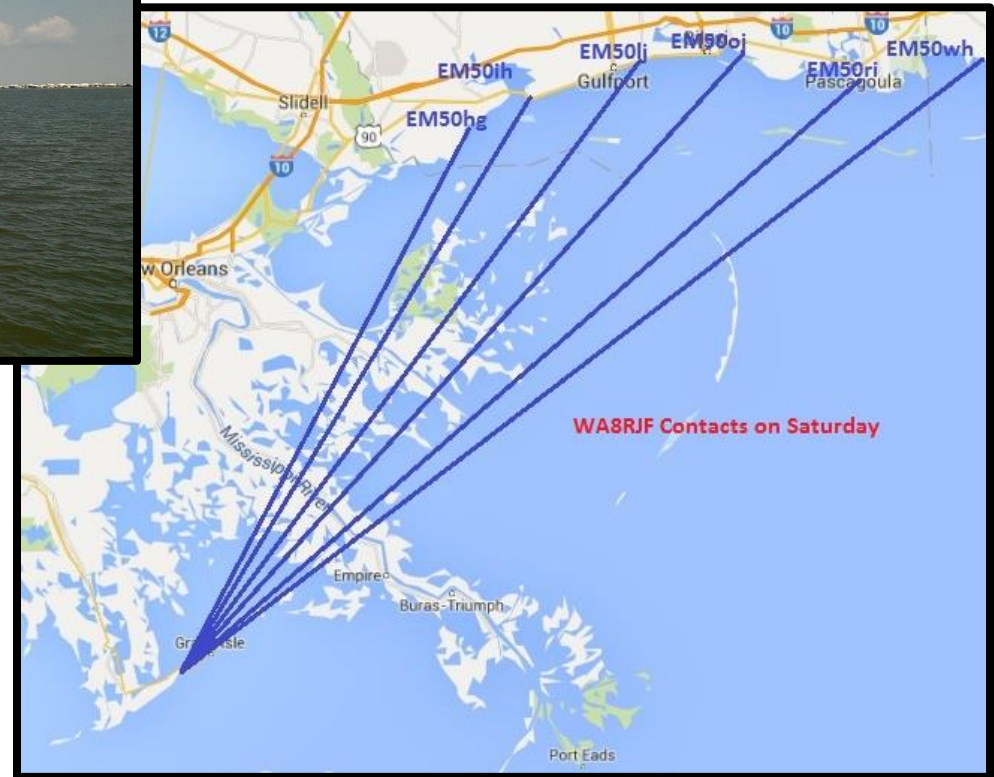
Saturday's Location in EL49xf



Tracking WA8RJF/rover on Saturday



View looking northeast to WA8RJF

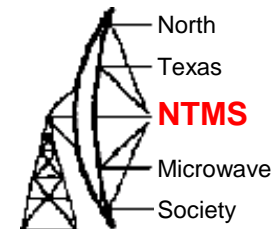


A New Experience as a Rover

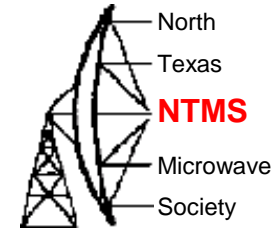


Motel manager lets me use the deck for the day.

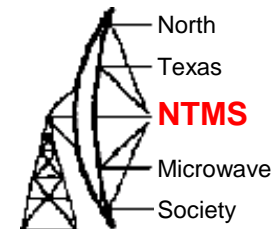
WA5YWC 40 element 10 GHz Alford Slot Antenna for Rover Operation



Slot Antenna after 820 mile trip from Denver to Home

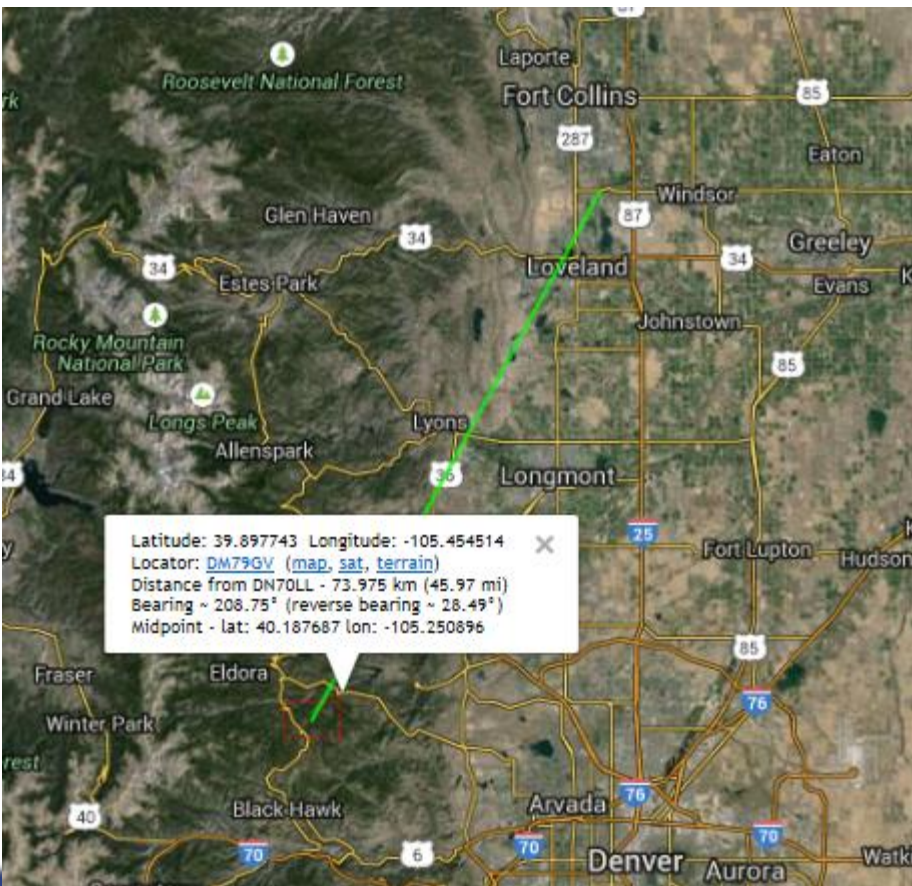


K0RZ Beacon DM79gv 10368.020 MHz 50 mW to Slot antenna at 10,000 ft

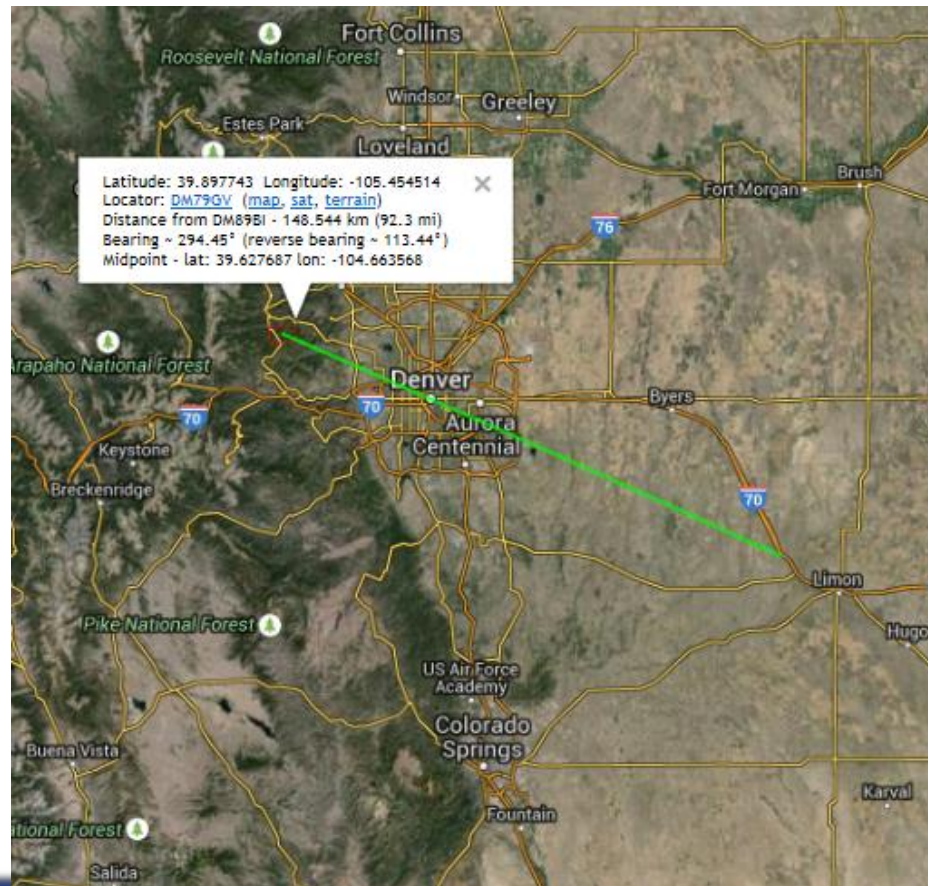


WA5YWC DN70ll at 46 miles with
40 element slot antenna

W5LUA DM89bi at 92 miles with
40 element slot antenna

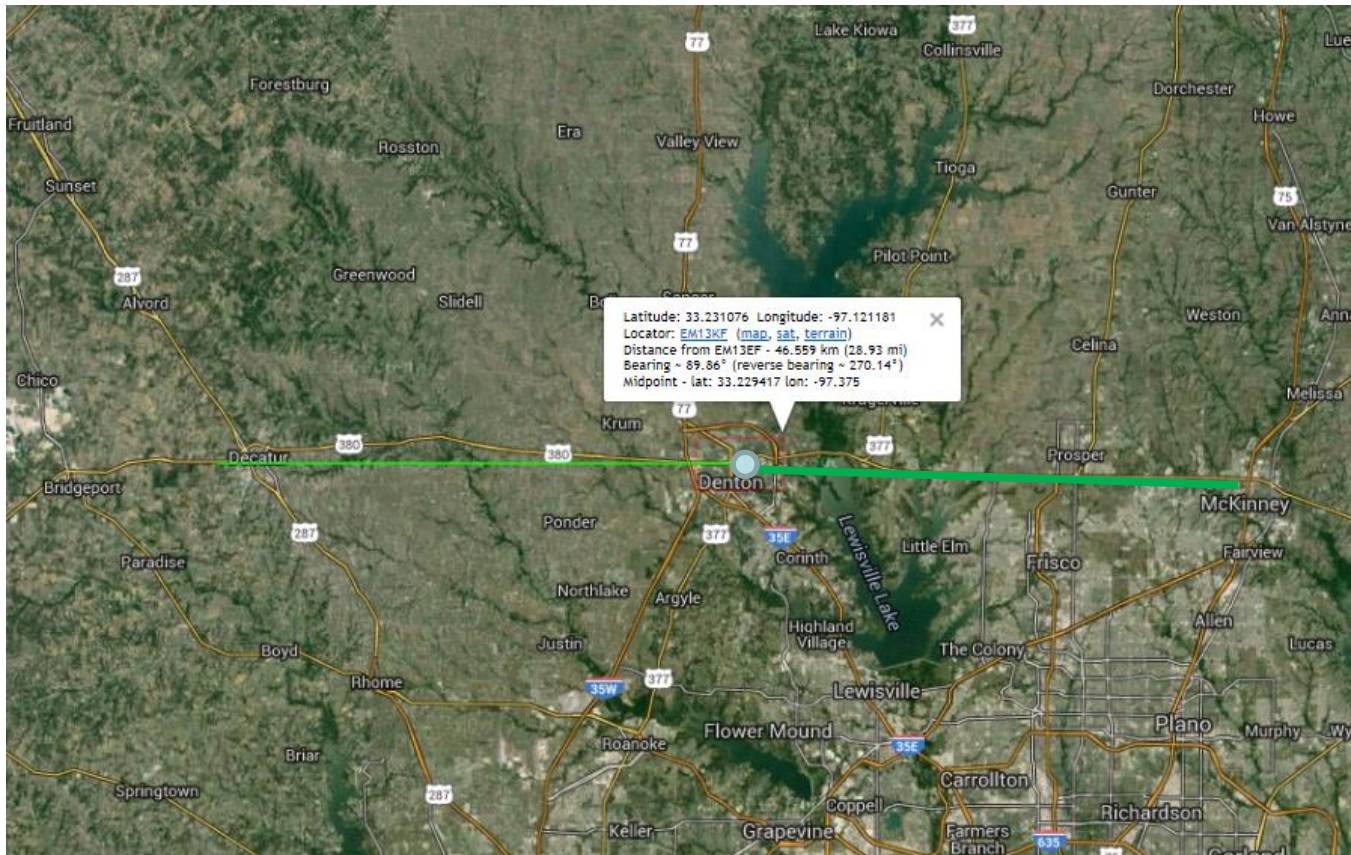
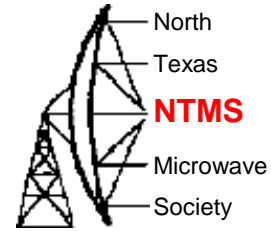


Latitude: 39.897743 Longitude: -105.454514
Locator: [DM79GV](#) ([map](#), [sat](#), [terrain](#))
Distance from DN70LL - 73.975 km (45.97 mi)
Bearing ~ 208.75° (reverse bearing ~ 28.49°)
Midpoint - lat: 40.187687 lon: -105.250896



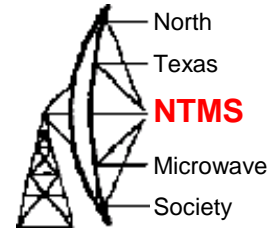
Latitude: 39.897743 Longitude: -105.454514
Locator: [DM79GV](#) ([map](#), [sat](#), [terrain](#))
Distance from DM89BI - 148.544 km (92.3 mi)
Bearing ~ 294.45° (reverse bearing ~ 113.44°)
Midpoint - lat: 39.627687 lon: -104.663568

W5HN Beacon EM13kf 10368.380 MHz 180 mW to Slot antenna at 280 ft



W5LUA heard the
W5HN beacon from
Decatur EM13ef to
McKinney in
EM13qf
Best DX about 30
miles

NTMS Activities



- Feb 13 - NTMS Meeting Noon to 4 PM
- March 5 – NTMS Meeting
- April 2 – NTMS Meeting
- May 7 – NTMS Meeting
- June 11 HAMCom Irving, Texas

Thanks for Listening!



- Any Questions?
- For additional information on current events
www.ntms.org
- See you on the microwave bands!