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Conquering Lake Lavon on 122 GHz

W5LUA & AA5AM

October 3, 2020

150 ft. Test Range

Far field for a 12 inch dish requires 250 ft. – Next time I will extend it further down the driveway

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AA5AM 122 GHz Setup

W5LUA 122 GHz Setup

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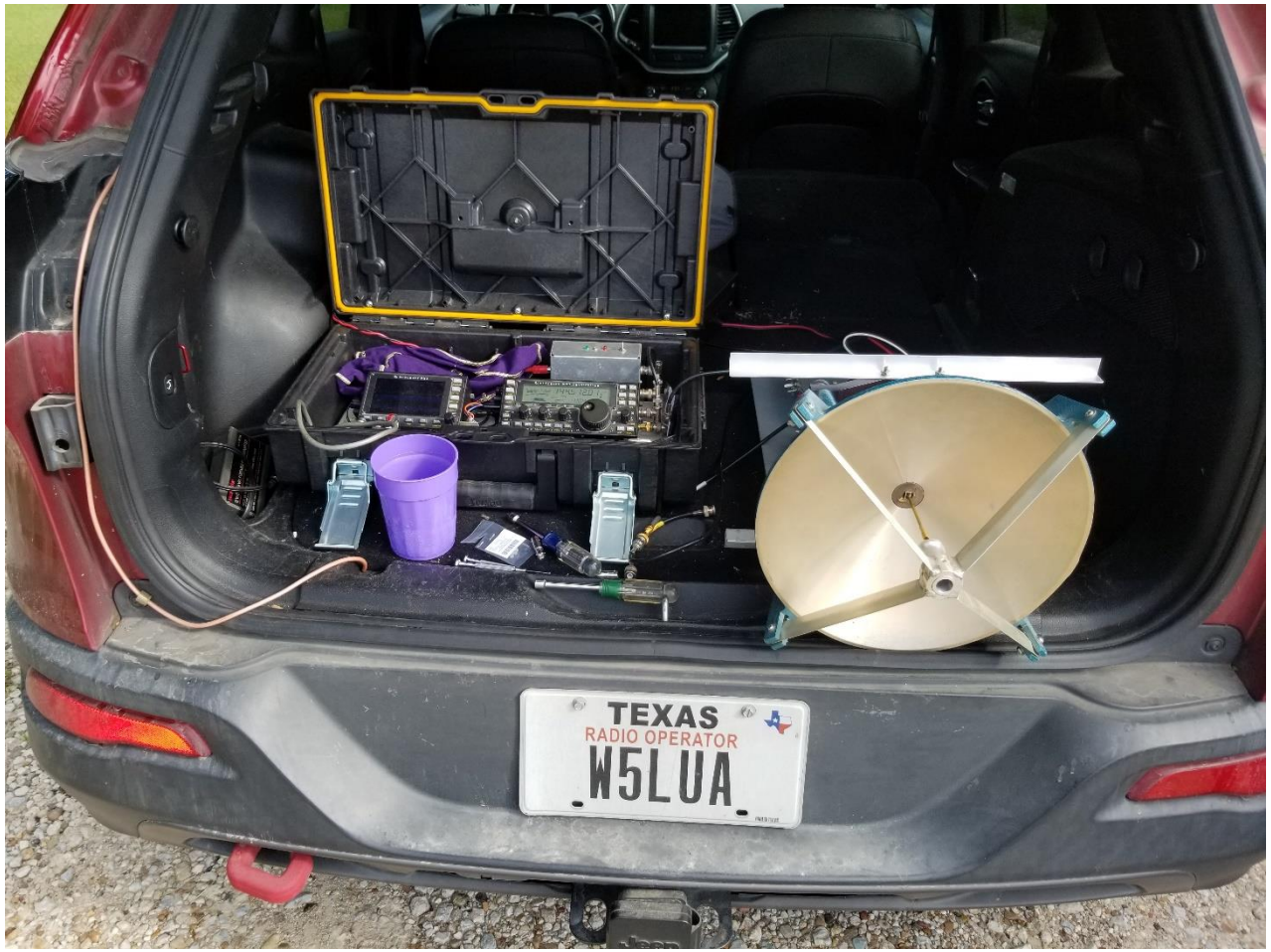

Antenna range showed my 12 inch dish to have ~ 22 dB gain over the 1” horn

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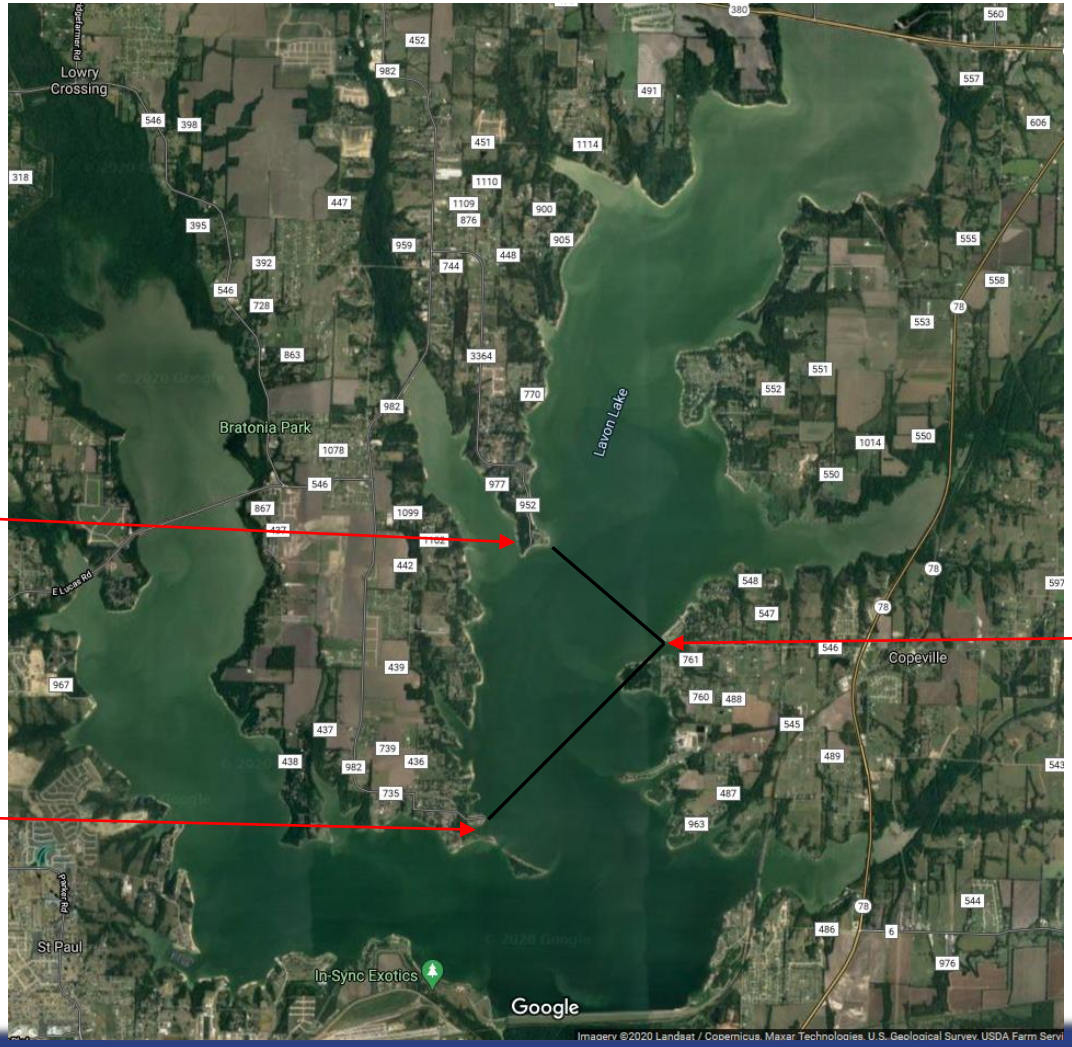
Paths on Lake Lavon

Tickey Creek Park
W5LUA

Clearlake Park
W5LUA



Pebble Beach Park
AA5AM

W5LUA View from Tickey Creek Park to Pebble Beach Park

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Pebble Beach Park = EM13SC50PC
Tickey Creek Park = EM13SC32DS

Latitude: 33.094868 Longitude: -96.473835
Locator: EM13SC32DS (map, sat, terrain)
Distance from EM13SC50PC - 2.303 km (1.43 mi)
Bearing ~ 302.49° (reverse bearing ~ 122.49°)
Midpoint - lat: 33.089323 lon: -96.463367

This is Scott's vehicle

We successfully worked Horn to Horn and Horn to Dish

Scott's horn to my 12" Dish at 2.3 km

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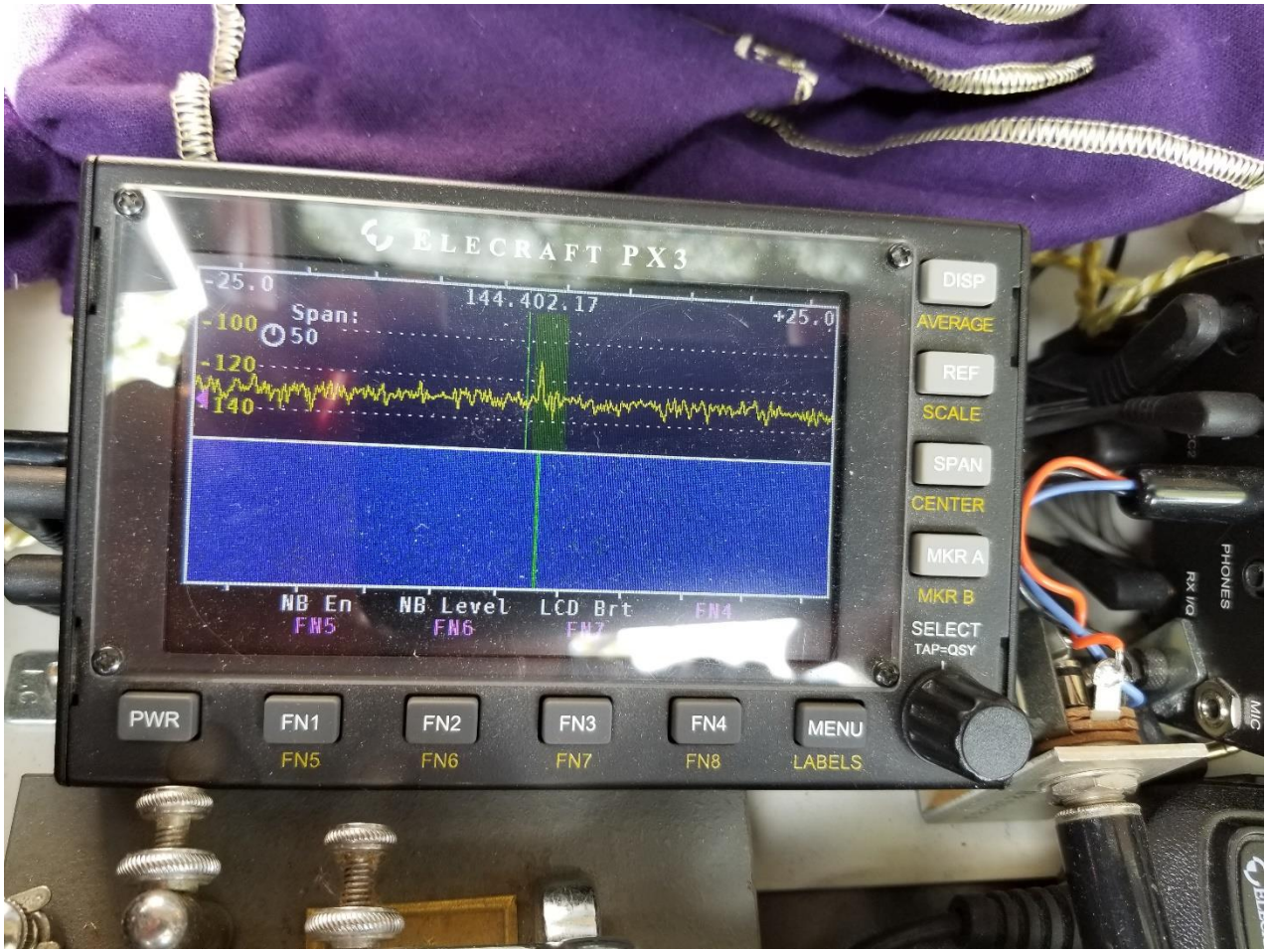

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W5LUA 122 GHz setup

Next time I will have a tripod

This is not the way to aim an antenna with a .5 degree 3 dB beamwidth! But it was my first time out.

AA5AM looking toward Tickey Creek Park from Pebble Beach Park

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Tickey Creek Turnaround

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AA5AM 122 GHz Setup on Lake Lavon

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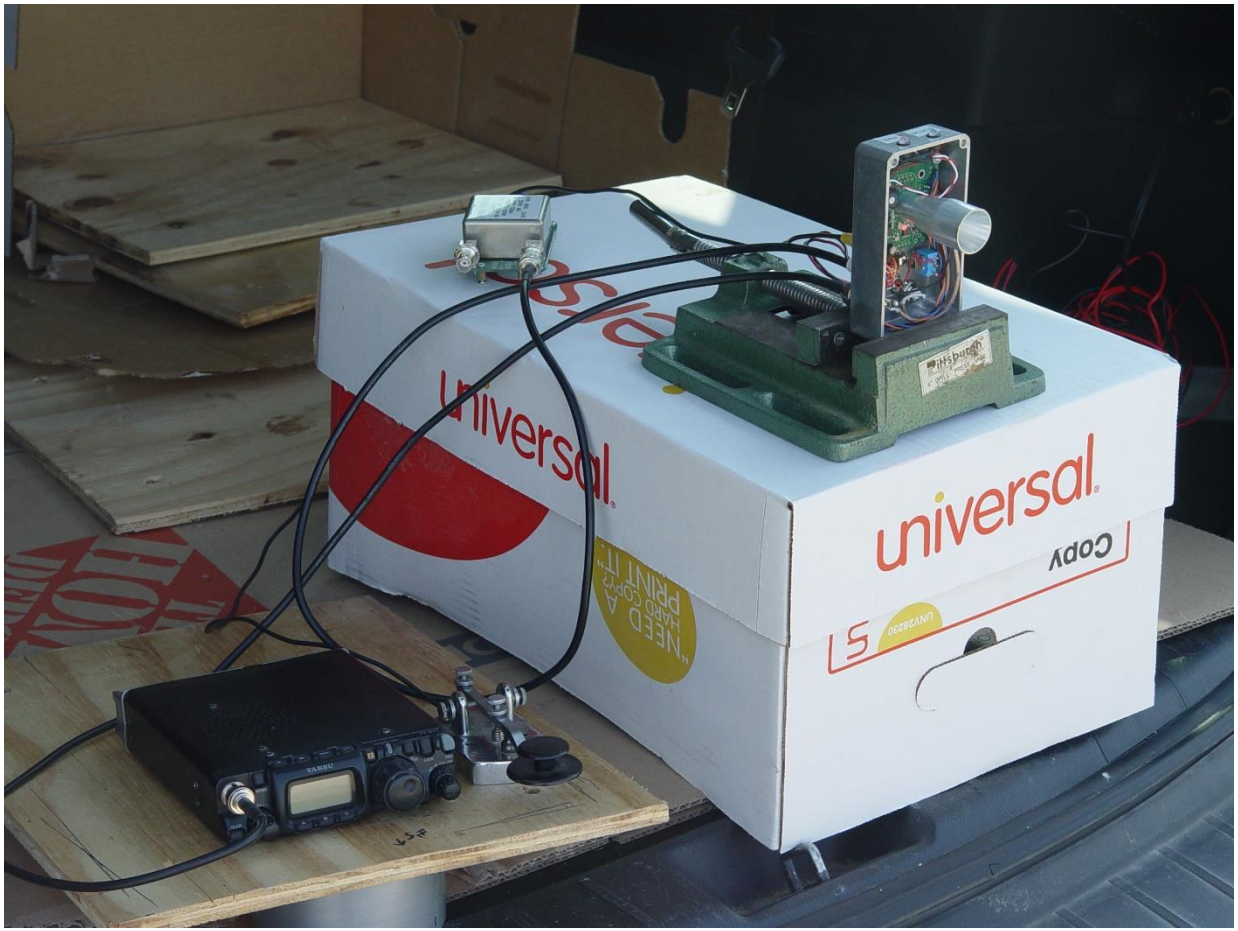

W5LUA View at Clearlake Park

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Pebble Beach Park = EM13SB59HQ
Clearlake Park = EM13SB15QG

Latitude: 33.081944 Longitude: -96.455903
Locator: EM13SB59HQ (map, sat, terrain)
Distance from EM13SB15QG - 3.484 km (2.16 mi)
Bearing ~ 53.98° (reverse bearing ~ 233.98°)
Midpoint - lat: 33.072831 lon: -96.470835

This is the northern boat ramp

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W5LUA at Clearlake Park

View from Pebble Beach Park to Clearlake Park Boat Ramp

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Our 1.6 km 122 GHz Shot during the 10 GHz Up Contest

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W5LUA Location

AA5AM QTH

Scott's View to my Location

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Al's View to Scott's QTH

Path Loss Calculations

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					Additonal								
					Atmospheric								
				Path	Absorption			Received	Receive		Receive	Expected	Actual
Path	Pout	Antenna	Efficiency	Loss	~ 2 dB/km	Antenna	Efficiency	signal level	NF	IF (bw)	noise floor	S/N	S/N
2.3 km	-3 dBm	27 dBi Horn	50%	143 dB	5 dB	27 dBi Horn	50%	-97 dBm	12 dB	2 kHz	-129 dBm	32 dB	10 dB
	-3 dBm	21 dBi Horn	coupling losses	143 dB	5 dB	21 dBi Horn	coupling losses	-109 dBm	12 dB	2 kHz	-129 dBm	20 dB	10 dB
	-3 dBm	21 dBi Horn	coupling losses	143 dB	5 dB	43 dBi Dish		-87 dBm	12 dB	2 kHz	-129 dBm	42 dB	20 dB
3.5 km	-3 dBm	27 dBi Horn	50%	145 dB	7dB	27 dBi Horn	50%	-101 dBm	12 dB	2 kHz	-129 dBm	28 dB	6 dB
	-3 dBm	21 dBi Horn	coupling losses	145 dB	7 dB	21 dBi Horn	coupling losses	-113 dBm	12 dB	2 kHz	-129 dBm	16 dB	6 dB
	-3 dBm	21 dBi Horn	coupling losses	145 dB	7 dB	43 dBi Dish		-91 dBm	12 dB	2 kHz	-129 dBm	38 dB	15 dB

Atmospheric Absorption ~ 2 dB/km based on Hughes MPD system calculator and assumes both oxygen and moisture at sea level and 68F
Our conditions at time of QSOs – 84F, 63% RH, Dew Point 71F

Tim VK2XAX suggests losses of 6 dB in coupler (must be mismatch loss)
Simulated DSB NF of 8.7 dB suggests SSB NF ~ 12 dB

Our Next Attempt
4.32miles / 7 km

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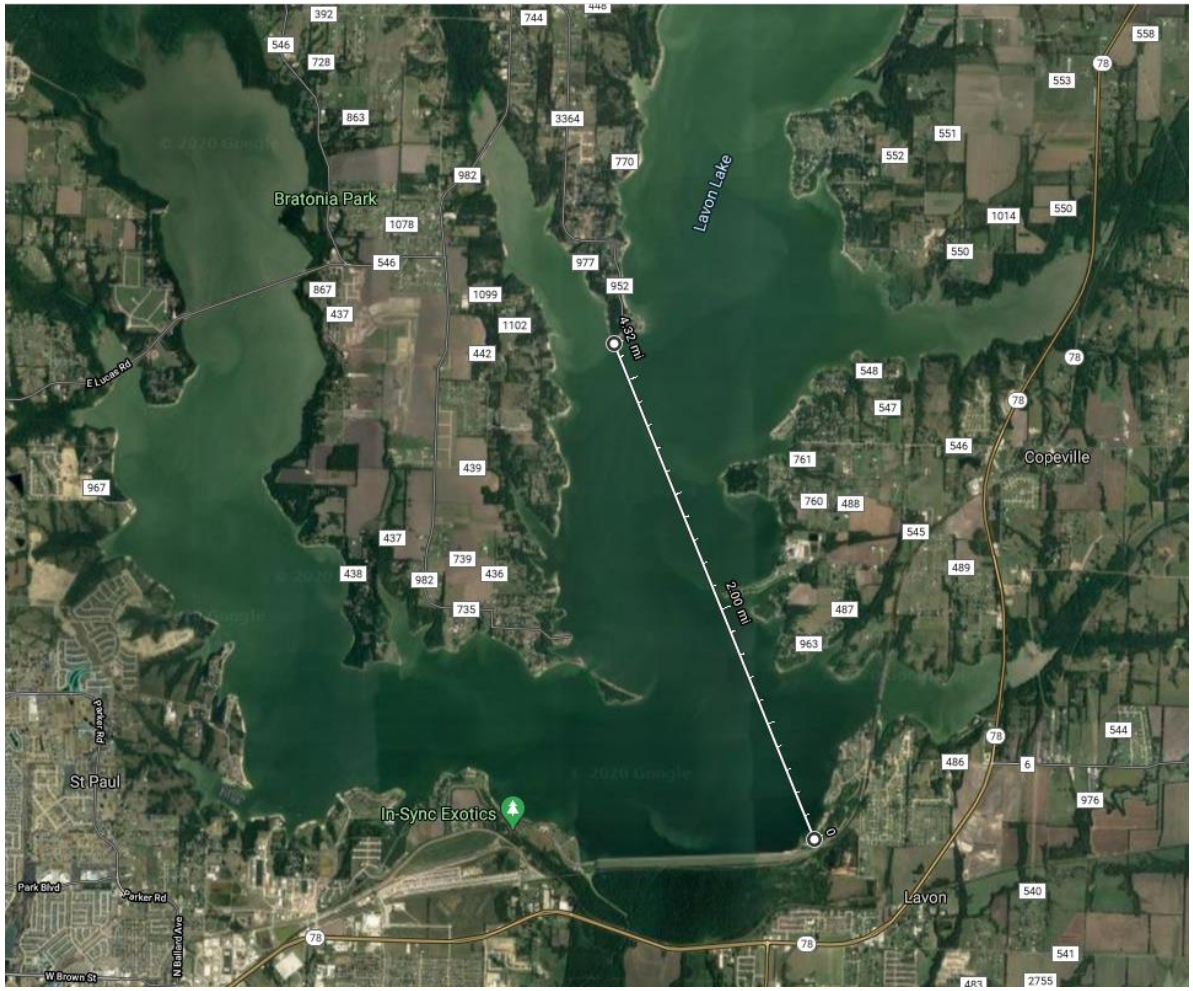

Tickey Creek Park
To
East Side Lavon Dam

Another Attempt
4.9 miles / 8 km

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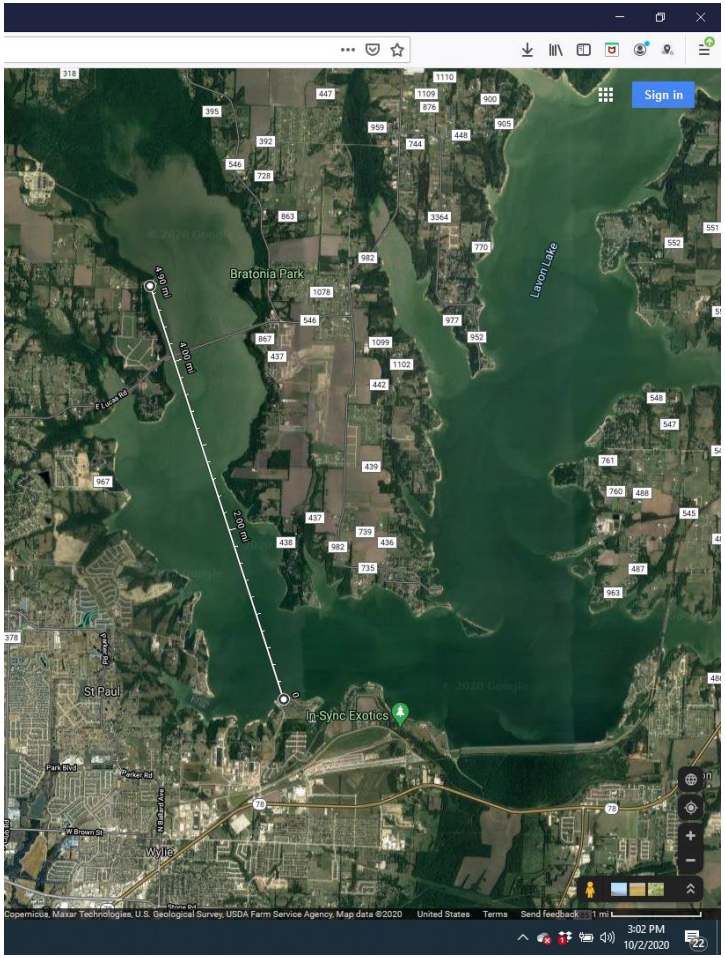

Highland Park
To
East Fork Park

Another Attempt
5 miles / 8 km

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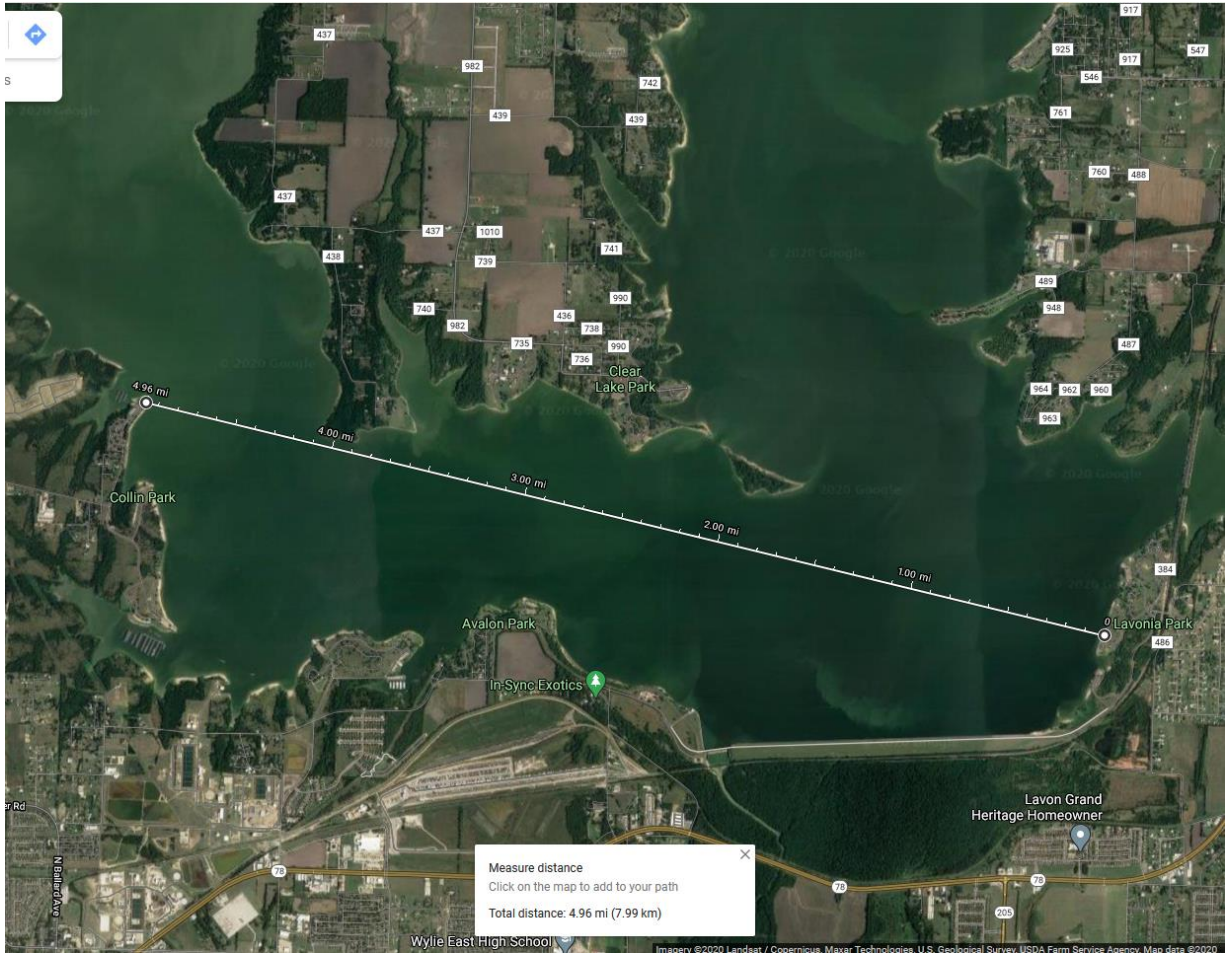

North of Collin Park
To
Lavonia Park

From Tim VK2XAX

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- Hi all,
- Second run interest is now north of 140 units so I've has some quotes returned from the manufacturers.
- The price of the horn & feed/coupler remains unchanged.
- The cost of the assembled & tested board has increase by $20 USD due to the lower quantity requested, to $148USD each.
- The cost of the blank PCBs is now $3.00 an increase of $1 per board.
- I intend to close the interest list next Friday 8th of October and open a new Fundrazr to collect funds for manufacture shortly thereafter.
- If you want anything, now is the time to put your hand up, or if you know someone who is looking to get on 122GHz, please let them know ASAP and get them to to contact me to get on the 122GHz second run interest list.
- regards
- Tim
- VK2XAX@skybase.net
- http://tiny.cc/7jvmsz

- Join “The122GProject” on groups.io

Summary

- Signals are a lot weaker than we thought or hoped they would be.
- My dish needs optimization
- Scott plans to install on a dish as well
- We both plan to attach our 122 GHz rigs to our existing 77 GHz rigs on tripods to enhance our ability to aim.
- Retest over same paths with optimized setups
- Document weather conditions, i.e. Temp, Dew point and Humidity.
- Work at 7 km on Lake Lavon and then look for a bigger lake!
- Questions?