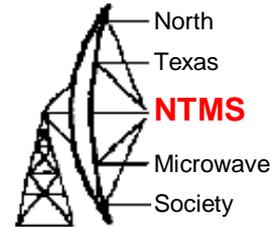


# A year of roving - 2023

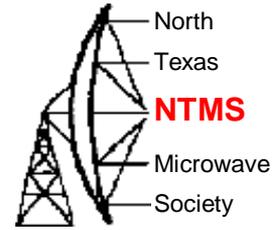
- Feb 3 New Wavelab 24 GHz tests – High Hawk proving ground
- March 18-19 NTMS MAD very cold & windy
- May 21 NTMS MAD
- June 3 ad-hoc RS rove
- July 24-27 On the way to CSVHFS (N Little Rock) rove.
- Aug 9 ad-hoc testing at High Hawk proving ground 24 GHz LNA
- Aug 10 GHz contest
- Aug 13 ad-hoc tests for thermal control on 24 GHz
- Sept 10 GHz contest
- Dec 10 47 GHz NTMS MAD

# Feb 3 – 2 New Wavelab 24 GHz rover units



High Hawk proving ground – 1 mile DX





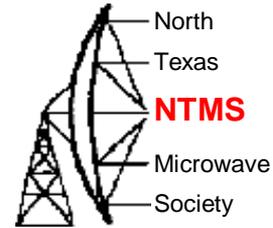
# March NTMS MAD

very cold & windy

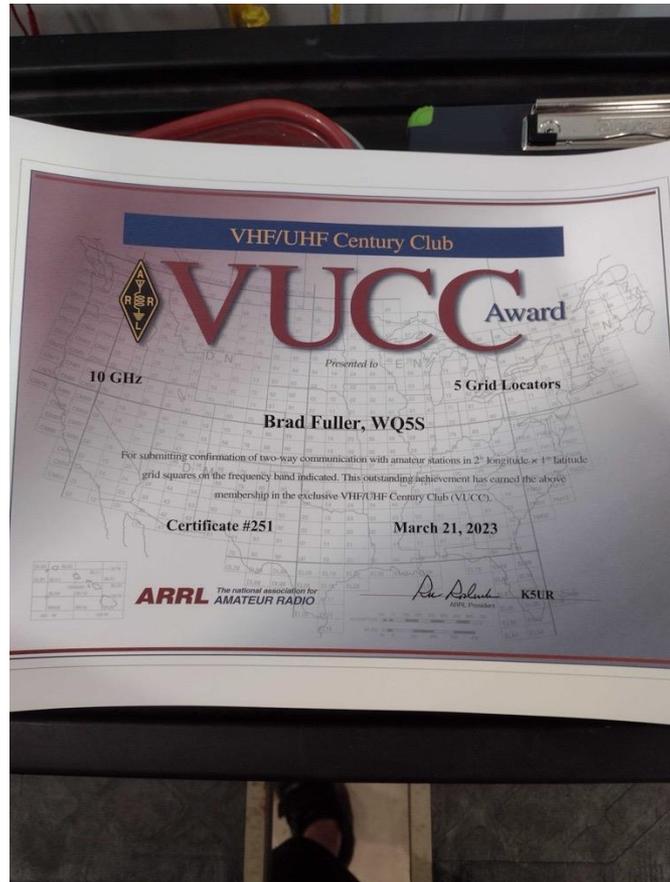
WQ5S Brad was at W5FKN EM13jh



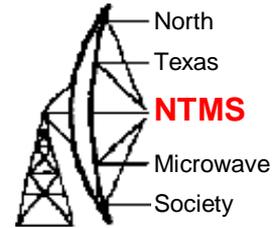
# March NTMS MAD



WQ5S earned VUCC on 10 GHz!



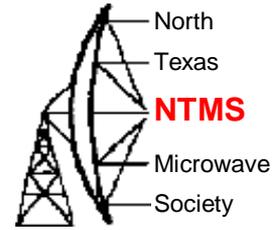
# March NTMS MAD



very cold & windy



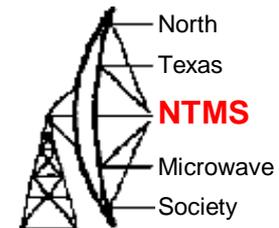
# March NTMS MAD



AA5AM Scott's 10/24/47 GHz setup



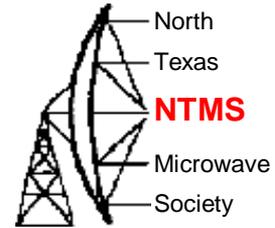
# March NTMS MAD



Paul at EM12MQ near I-20/408



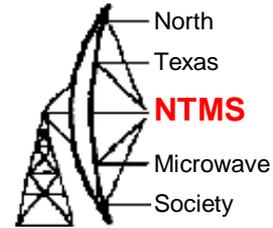
# March NTMS MAD



First contact for two new 47 GHz systems



# May NTMS MAD



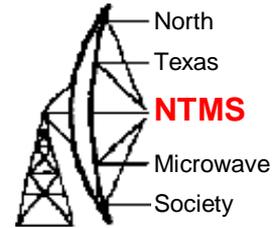
First DX for new 24 GHz system



New good location in EM01vx17



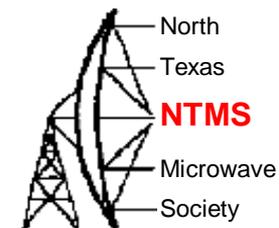
# May NTMS MAD



EM01vx17 location – 200 km on 24 GHz w/W5LUA



# May NTMS MAD results



- May 21 – spring NTMS activity event



WQ5S was at W5FKN/EM13

KM5PO & KI5EMN

EM04xs52ta Warika, OK

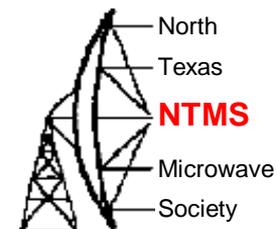
EM03vg85qd Jacksboro, TX

EM02wl37 Hwy 281 Lipan, TX nil

EM01vx17 Hwy 219 Dublin, TX KI5EMN 10 GHz, KM5PO/W5LUA  
~200km 24GHz

EM11kx88 Hillsboro, TX nil

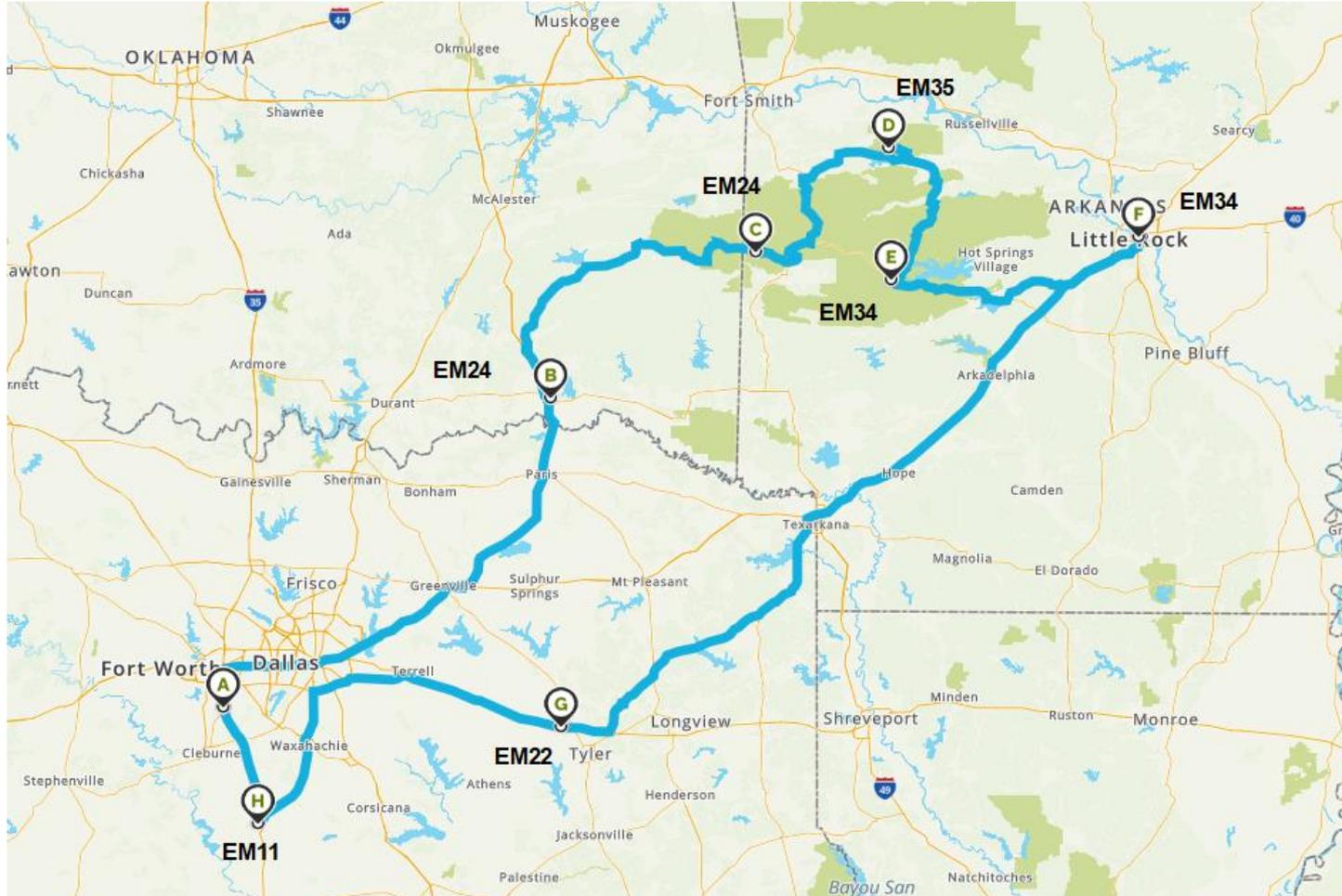
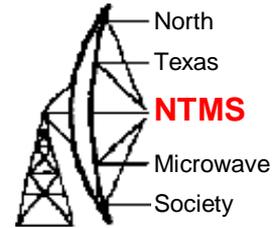
# On the way to CSVHFS



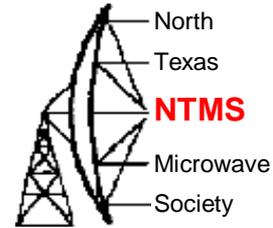
- 7/24-7/30
- AC0RA  
Wyatt



# On the way to CSVHFS



# On the way to CSVHFS



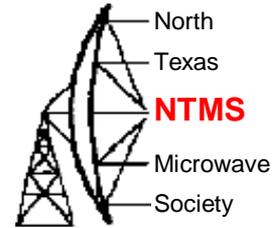
## EM24ea near Soper, OK



## Pre 10 GHz contest check out

- Umbrella works well
- Tried WSJT with equipment outside
- Established that KX-3 was drifting on 144 MHz in phone call with AI after the stop.
- Good success on 10 GHz
- Strong WSJT sig from AI

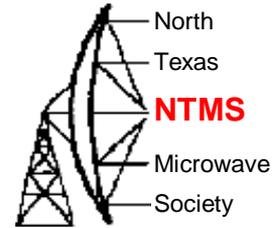
# On the way to CSVHFS



EM24 overlooking Kiamichi Valley. 599 10 GHz to DFW 255 km



# On the way to CSVHFS



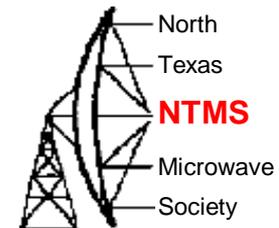
Typical cheap motel – Mt IDA, AR



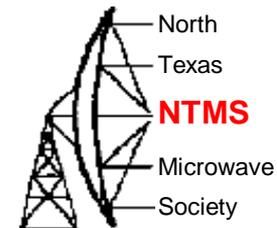
Mount IDA overlook



# On the way to CSVHFS



# CSVHFS North Little Rock



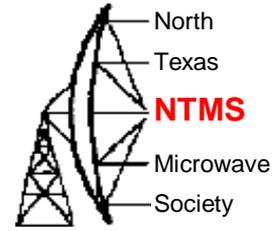
The two rigs that hold the Texas  
47 GHz DX record!



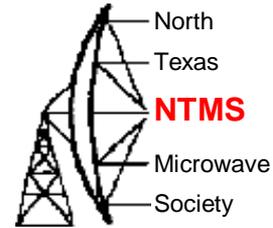
K9PW worked via building  
scatter on 47 GHz



# CSVHFS North Little Rock



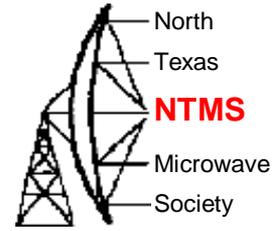
# On the way home from CSVHFS



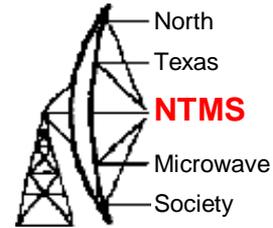
- Worked: AA5C on 24 GHz, WB5ZDP, AA5AM & AA5C on 10 GHz



# On the way home from CSVHFS



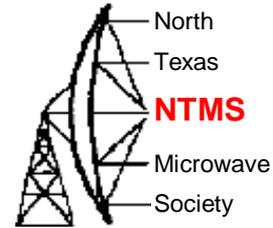
# Aug 9 ad-hoc testing



Testing Wavelab 24 GHz with DB6NT LNA prior to contest  
DigiLO was heard over 1 mile DX at High Hawk proving ground



# 10 Ghz contest part 1



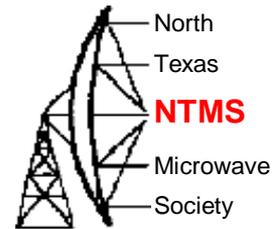
122 GHz attempt failed at sunrise first stop



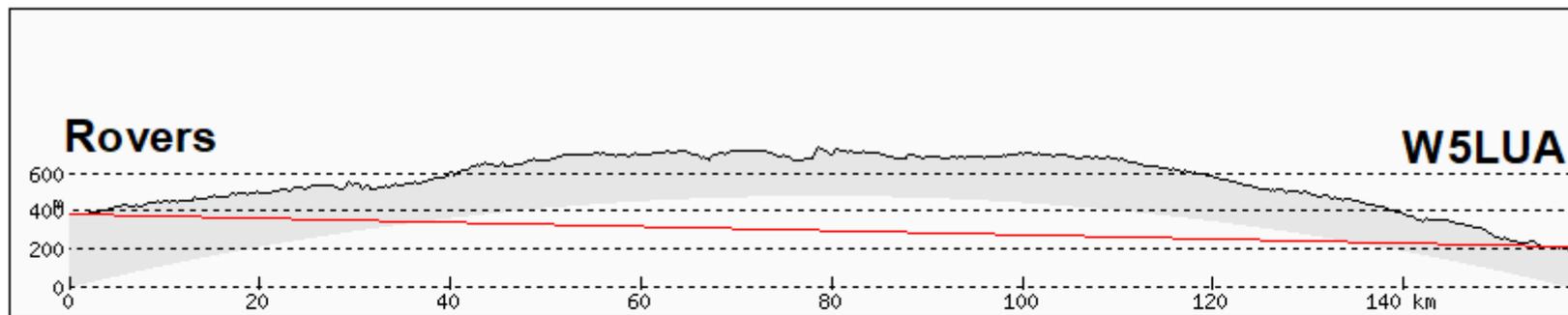
Ending day 1 at Blue Ridge school (shaded)



# 10 Ghz contest part 1



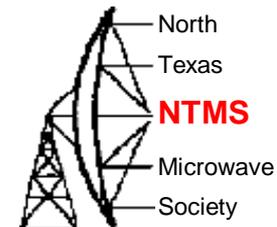
Day 2 Sunday started with a long 24 GHz contact from Sulphur OK to W5LUA – 157 km



Parameters

<input checked="" type="checkbox"/> show scale	<input checked="" type="radio"/> straight line	fixed exaggeration (e.g. 2) <input type="text" value="20"/>
<input checked="" type="checkbox"/> show lines	<input type="radio"/> true line of sight	
<input type="radio"/> flat Earth	frequency (MHz, e.g. 5800) <input type="text"/>	y range (e.g. -20,100) <input type="text"/>
<input checked="" type="radio"/> curved Earth		
<input type="radio"/> plate carée	refraction (e.g. .14) <input type="text"/>	<a href="#">Reset</a>
<input checked="" type="radio"/> great circle		

# 10 Ghz contest part 1



Day 2 Sunday ended the day with heat stroke/burns  
 Scott AA5AM wrote email. I wrote a paper.

PROPOSAL TO MOVE CONTEST DATES - APRIL 10-16 AND 17-23

This research has been motivated by observations made during the APRIL 10-16 and up contest which took place on August 19/20/2024.

**The problem**  
 Several 10/20/47 GHz users and fixed portable outdoor ops were participating in the Texas/OKlahoma/Oklahoma area and some were affected by the extreme heat conditions including heat stroke and physical burns from hot equipment. The research will set out to prove that outdoor operating conditions are getting worse due to warmer temperature trends and that a shift in contest dates is needed to protect and preserve our rover team's health and participation in the APRIL 10-16 and up contest.

The proposal is to pivot the first weekend of the contest from the third weekend of August to the first weekend in September.

Heat advisories are not limited to Dallas-Fort Worth of course and an expanded study should be made that would identify more/portable impacts due to the increasing heat related emergency room visits, heat related injuries and fatalities across the United States. (see Figure 1.)

**Figure 1. Heat-related deaths, U.S. 1999-2022\***

Although Arizona, California, and Texas account for only approximately 23% of the U.S. population, these three states accounted for approximately one third (33.2, 37%) of heat-related deaths among U.S. residents in the 10-year period ending in 2022.†

In a separate study, the NCEM (National Conference of Environmental Health) issued a report July 2023 that found heat-related deaths in Florida have risen an 80% between 2019 and 2022.†

FIG. 1

PROPOSAL TO MOVE CONTEST DATES - APRIL 10-16 AND 17-23

**Heat wave + contest**  
 To illustrate the conditions in our area during the 2023 first weekend of the contest, first consider the fact that we were experiencing an overall heat wave before the start of the contest for the month of August (average 89°F measured, 89.2 degrees). See Figure 3 for the daily temperature for the month of August depicting two heat waves over 10 days in length. The contest dates are highlighted.

**Figure 3. Temperatures for August 2023 (DFW Airport)**

In the DFW-Arizona area some rover teams had called participation as early as Saturday morning 8/10 which removed opportunities to score and on Sunday 8/20 rovers and fixed portable operators reported early afternoon temperatures of 107 to the shade. The rover team I was with reported a high of 111 at our first stop mid-afternoon on Sunday. In Figure 4 below see temperatures over 100 by 12 pm with Sunday afternoon heat index reaching 135.

**Figure 4. The temperature on Saturday August 19 and Sunday August 20.\***

FIG. 3

PROPOSAL TO MOVE CONTEST DATES - APRIL 10-16 AND 17-23

**The Proposal**  
 To illustrate the proposed move in dates we have charted the 8-week period of August 8, September and the next 8 years for our three state area (North Texas, Oklahoma and Southwest Arkansas).† A red dot signifies the actual historical week in August of the 10 GHz and up contest (first weekend). The temperature bar also shows the average for the week. Except for August 2022, the first week in September is cooler by 6 to 8 degrees.

Moving dates would have impacts on other activities scheduled and with the APRIL September VHF contest meeting on the second full weekend of September there would be less recovery time for a rover that operated near the first week of September as well.

It is imperative that we examine these data and formulate a proposal to educate our members to the danger of operating outdoors as well as their consideration for all operations including the temperature / humidity advisories borne out in this paper.

Thank you for your time.

James McMaster  
 W5JNF  
 President, North Texas Microwave Society  
 September 4, 2023

FIG. 5

PROPOSAL TO MOVE CONTEST DATES - APRIL 10-16 AND 17-23

**Heat Waves**  
 While there are calls to address heat [and cold] temperature values, there is a documented increase in the heat wave phenomena (characterized as occurring between May and September). The number of heat waves that declined from three to six periods per year and the length of the heat wave season has nearly doubled from 47 days to 72 days in the past 40 years. See <https://www.epa.gov/heatwaves/heatwaves> in Figure 1. Increases in the number of days and increases in the average temperature recorded during heat waves has also been observed.

**Figure 3. Heat Wave Characteristics in the United States by Decade, 1960-2022\***

A paper assembled by 17 authors published in Science, September 2023 titled "Intergenerational inequalities in exposure to climate extremes" states we estimate that children born in 2020 will experience a two- to sevenfold increase in extreme weather, particularly heat waves, compared with people born in 1960, under current climate policy pathways.†

FIG. 2

PROPOSAL TO MOVE CONTEST DATES - APRIL 10-16 AND 17-23

**How much heat is too much heat?**  
 Since each person has unique abilities in adapting to environmental conditions this question is not easy to answer. Is hot weather the obvious concern only in hydration, sodium intake, reduction of exposure to direct sunlight, portable air conditioned cooling down. However, everyone has a tolerance that one acts according to age, previous adaptation to heat stress, etc. A typical rover will need up to an hour for each activation stop.

The **2023 US Extreme Environmental Age-Related Risks** published in the *Journal of Applied Physiology* an advisory 2023 "Protect Your First Responders" physiological observations to measure precise theoretical temperature limits for humans to extreme environments. This study found that heat stress occurs by using healthy adults at temperature significantly lower than previously theorized. "As dry-bulb [air] temperatures increase, there is a thermodynamic basis for increased humidity increases on the Celsius-Celsius index, and for every 1°C increase in temperature, a parcel of air can hold 7% more water vapor. Hence, the combination of elevated ambient heat and humidity, when quantified using the wet-bulb temperature, prevents humans' heat loss to the environment and can lead to heat-related illness and even death, especially in vulnerable populations."

It is important to note that the Texas State University study was conducted using healthy young adults between the ages of 18 and 34 (24 subjects, 13 males/13 females) who were exercising (jogging) at a rate approximately at a 10 (walk) similar to "average sedentary" and maintained to an environmentally controlled amount of heat and humidity while monitored for 100 temperature from various body areas as well as core temperature measurements from gastrointestinal temperature.

laboratory capsules that were ingested by subjects 1-2 hours before reporting to the laboratory.

The study resulted in identifying new maximum temperature/humidity levels at which the body cannot effectively release heat but rather the heat begins to flow back to the body core. Figure 2 reflects the study results under the ambient 80 and 90 area as the dangerous combination of heat and humidity. We were not reporting conditions in the marked area of

**Figure 3. Critical environment levels.\***

FIG. 3

PROPOSAL TO MOVE CONTEST DATES - APRIL 10-16 AND 17-23

**References**

1. <https://www.epa.gov/heatwaves/heatwaves>
2. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
3. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
4. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
5. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
6. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
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8. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
9. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
10. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
11. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
12. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
13. To calculate the weekly temperature average for operating areas:
  - a. Determine the 5-year period of average temperature for Texas, Oklahoma and Arkansas from CDC National Environmental Health Statistics Tracking and Information and Data Collection.
  - b. Import into Excel and add filters.
  - c. Select the option for our rover operation:
    - i. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
    - ii. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
    - iii. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
    - iv. <https://www.cdc.gov/ncez/heatwaves/heatwaves>
  - d. Select August and September time periods
  - e. A. Number each week and drop the calendar dates
  - f. E. Group into excel as bar chart type

FIG. 4

# 10 Ghz contest part 1

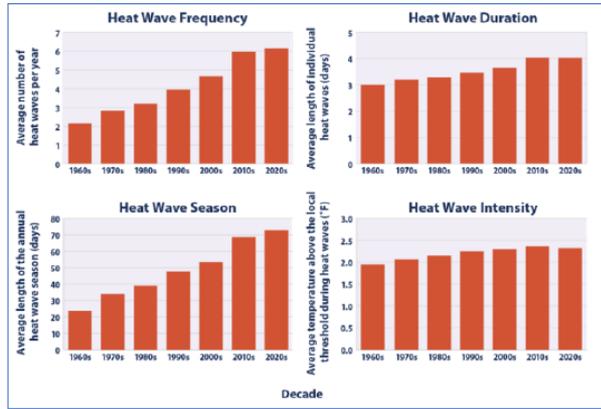
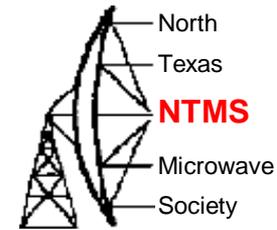


Figure 2. Heat Wave Characteristics in the United States by Decade, 1961–2021<sup>4</sup>

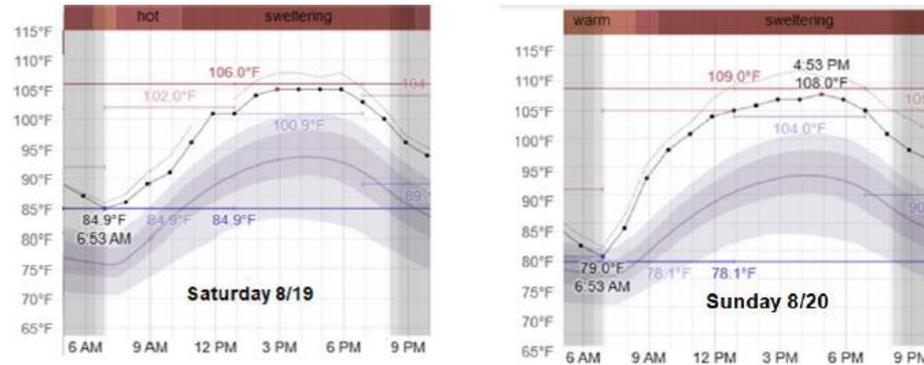
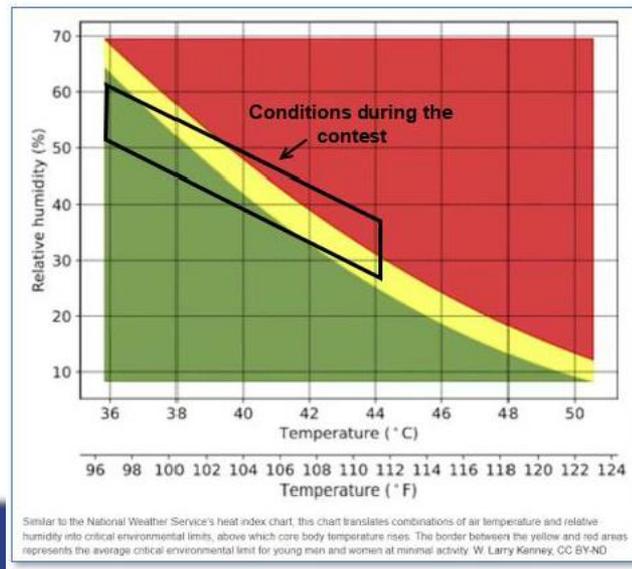
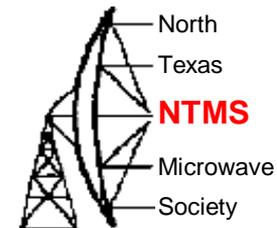


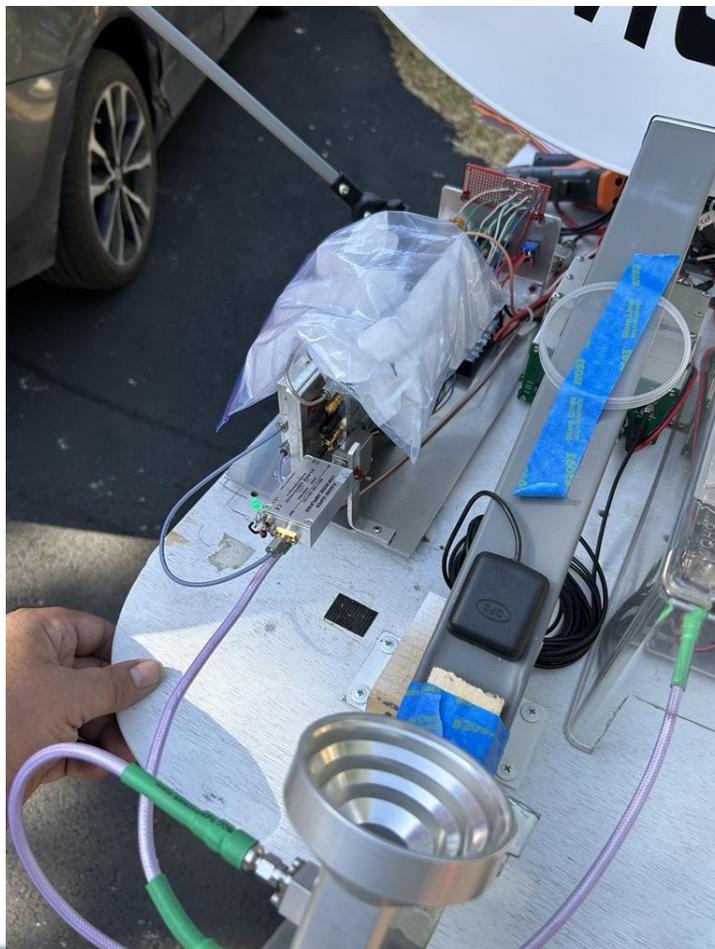
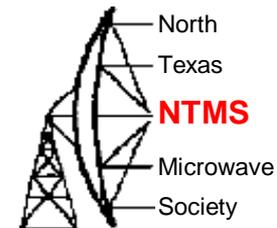
Figure 4. The temperature on Saturday August 19 and Sunday August 20.<sup>8</sup>



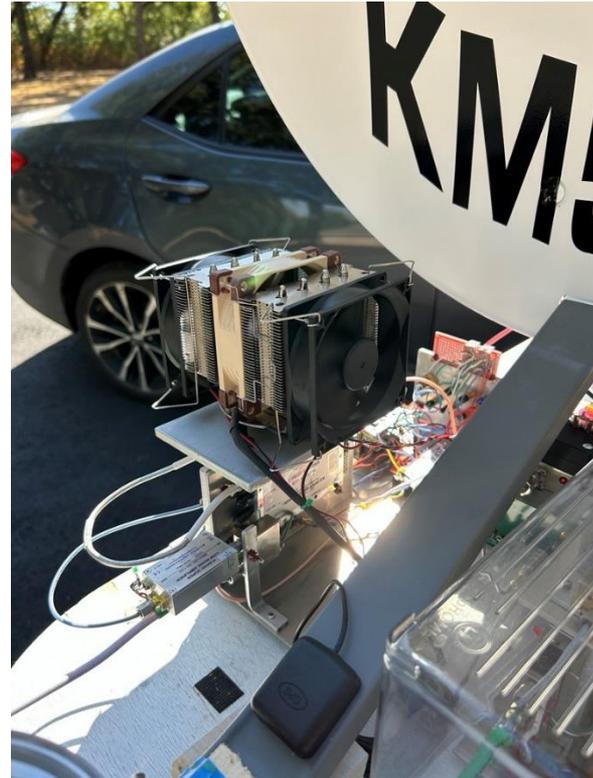
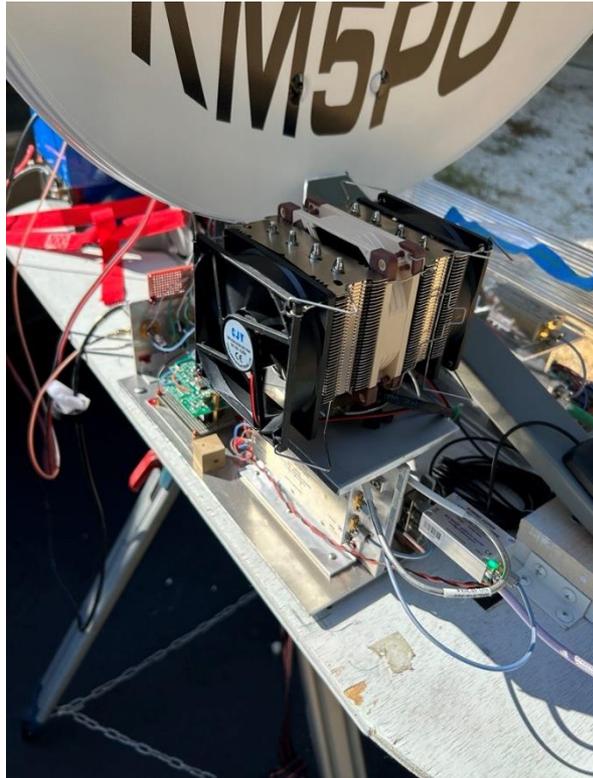
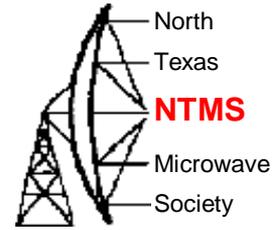
# Ad-hoc testing – thermal control



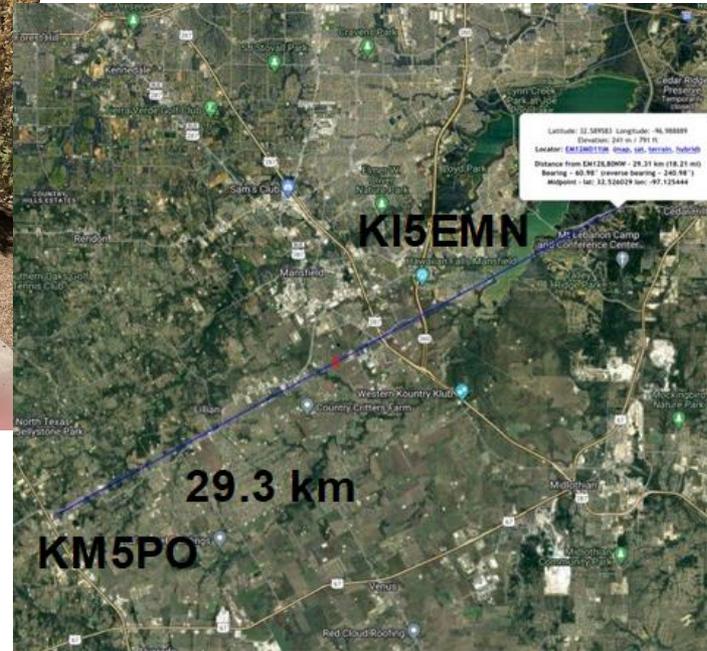
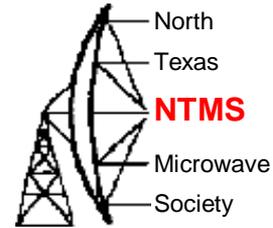
# Ad-hoc testing – thermal control



# Ad-hoc testing – thermal control



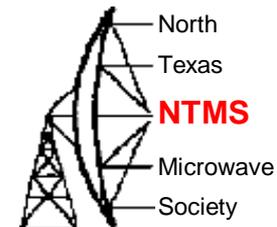
# Ad-hoc testing – thermal control



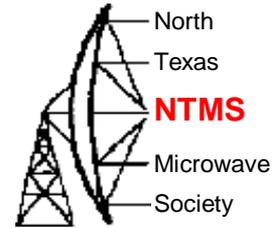
KI5EMN  
on 24 GHz  
FM 5x9

W5LUA  
strong on  
24 GHz  
WSJT @  
96 km

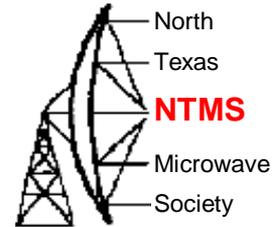
# Ad-hoc testing – thermal control



# Ad-hoc testing – 122 GHz



# 10 GHz contest part 2



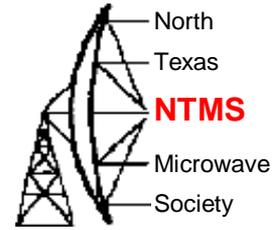
Rain preparation



Working AI on WSJT – 10 GHz from EM03vw N of Henrietta TX



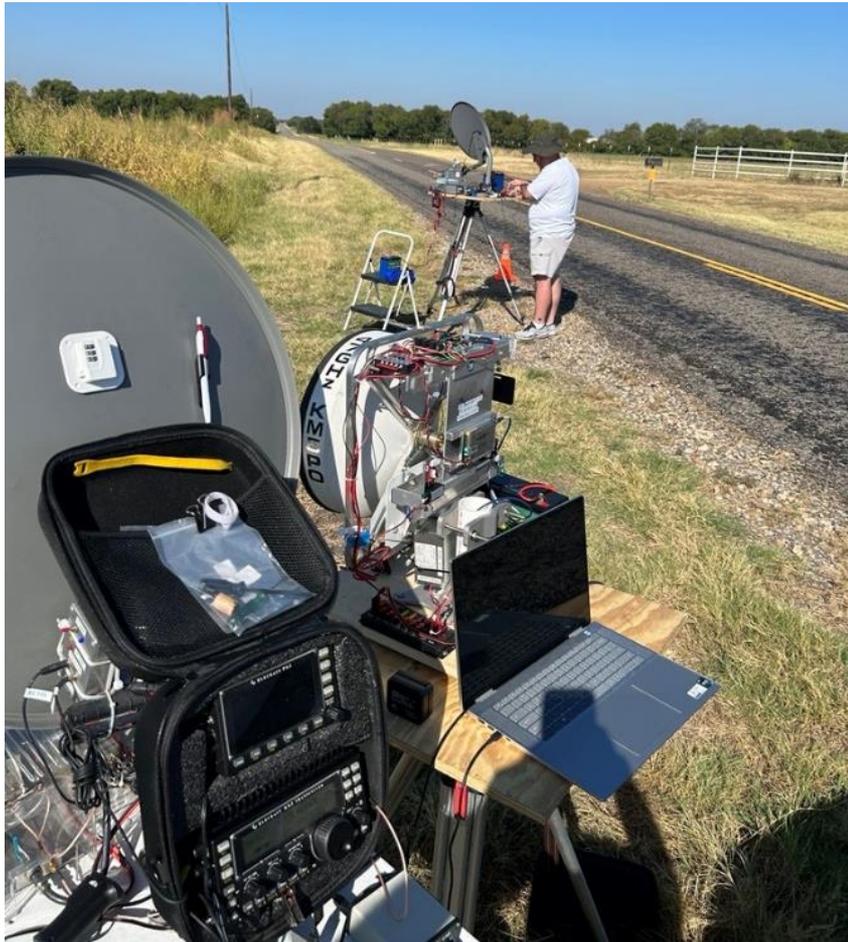
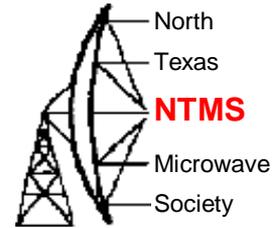
# 10 GHz contest part 2



10 & 24 GHz success from EM23ao near Honey Grove TX

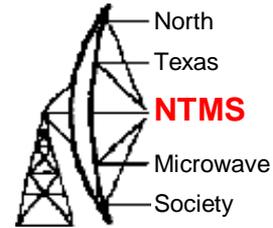


# 10 GHz contest part 2



- Ladonia Texas EM23, Digital and Analog contacts on 10 & 24 GHz.

# 10 GHz contest part 2

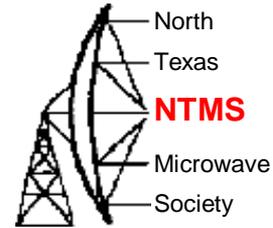


## 122 GHz contact in the log!



# Dec 10 NTMS MAD

## Focus on 47 GHz



- W5LUA has rotor improvements
- Two rovers on 47 GHz now – who is next?

Site			W5LUA				AA5C			AA5AM		
			EM13qc68				EM13se55			EM13sg53		
			Alt	DX	DX AZ	AZ	DX	DX AZ	AZ	DX	DX AZ	AZ
Sunday 12-10-23 KM5PO/KI5EMN												
EM12mw51ga	Macarthur ranch	Mythri's 8350 N. MacArthur Irving	499	39	56	236	35	58	238	38	51	231
EM13od56ch	Frisco School	10330 Red Cedar Dr. Frisco	801	17	102	282	32	82	262	34	68	248
KM5PO/Jim												
EM13tl30wt	Whitewright	E Line Rd Whiteright	797	44	209	29	31	192	12	23	197	17
EM23aj09ja	Ladonia #2	15493 SH-34 Ladonia	689	66	240	60	31	240	60	46	249	69
EM23ad19ig	Campbell	1301 CR 4109 Campbell	623	58	265	85	43	274	94	48	284	104
KI5EMN/Paul												
EM13th13ix	Blue Ridge High School	425 N Church St Blue Ridge	635	29	223	43	14	198	18	7	224	44
EM13td37bv	Farmersville/Brookshires	1803 W Audie Murphy Pkwy	605	21	78	258	7	122	302	13	151	331
EM13vd48al	Floyd	2615-2721 FM 903 Greenville	604	37	262.7	83	22	278	98	25	298	118

# Questions?

