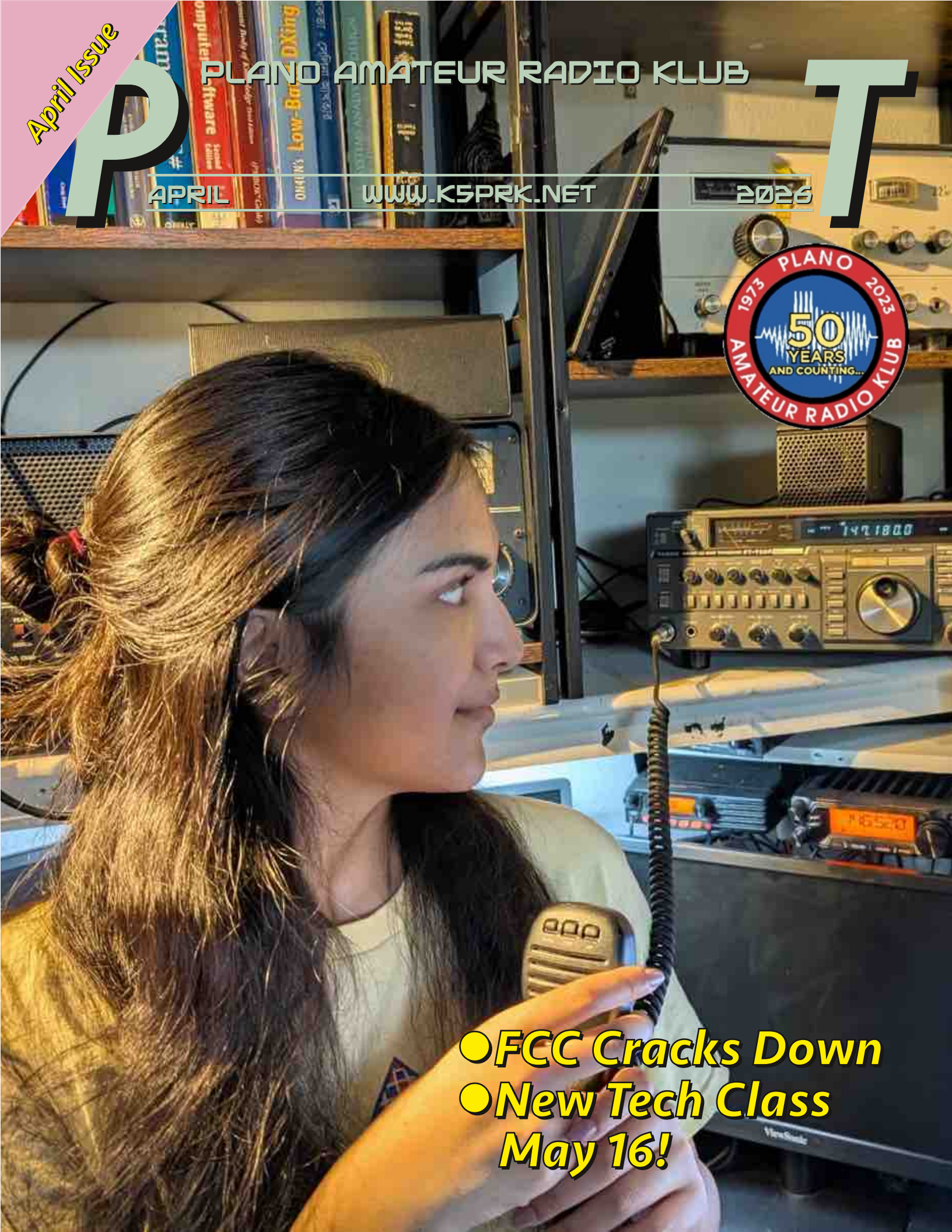

April Issue
PLANO AMATEUR RADIO KLUB
PART
APRIL
WWW.K5PRK.NET
2026
PLANO
1973
2023
50
YEARS
AND COUNTING...
AMATEUR RADIO KLUB
FCC Cracks Down
New Tech Class
May 16!

PARK HERE

Officers

(your answers begin here)

President	Mike Tharp KG5TJF	president@k5prk.net
Vice President	Bruce Cameron K6IL	vp@k5prk.net
Secretary	Damon Koch K5OCH	secretary@k5prk.net
Treasurer	B. J. Watkins K5BJW	treasurer@k5prk.net
Activites	Asif Ahmed K5SIF	activities@k5prk.net
Communications	Miranda Schwarck KE5YZP	communications@k5prk.net
Webmaster	James McCormick KG5KBP	webmaster@k5prk.net
Public Relations	Rob Forson K5WFR	pr@k5prk.net
Newsletter	Lonnie Webb KG5WHQ	newsletter@k5prk.net

EXPERIMENT AND HAVE FUN WITH YOUR RADIO

Learn more about the club at https://k5prk.net

Interact with the club at https://www.facebook.com/groups/k5prk

Have a groups.io conversation with the club at https://k5prk.groups.io/g/main

Are you ready to read the content in the newsletter? It's all technician accessible.

YOU HAVE BEEN DEPUITIZED AS ROVING JUNIOR NEWSLETTER REPORTER EXTRAORDINAIRE!

Go photograph, experiment, solder, attempt to antenna your lawn chairs. Just write it all down and send the information to newsletter@k5prk.net

PARK REPEATERS

The Plano Amateur Radio Klub operates five repeaters, which are located in Allen, Texas about 180 feet above ground level. All licensed amateur operators are welcome to join us on the air.

Our repeaters are open.

147.180 MHz + PL 107.2
K5PRK VHF
Voice Repeater

444.250 MHz + PL 79.7
K5PRK UHF
Voice Repeater

441.575 MHz +
DStar UHF
Digital Voice Port B

1295.000 MHz – 20.000
DStar 23cm
Digital Voice Port B

1255.000 MHz
DStar 23cm Digital Data

Broadcastify
K5PRK 444.250
K5PRK 147.18

If you notice problems with any of the club's repeaters, contact communications@k5prk.net via email with a detailed descriptiion of the issue.

FROM THE PRESIDENT

Building a 2026 Strategy for Plano Amateur Radio Klub

By Mike Tharp KG5TJF
president@k5prk.net

Happy April,

I'm just surfacing from tax prep long enough to give a very quick update for April.

Neil Gould NE5IL has volunteered to join **Asif Ahmed K5SIF** with our effort to develop a community activity program to promote the club and our hobby in general.

I've reserved Russell Creek for the 2026 Field Day. **Rob Forson K5WFR** is working to promote the event with the Boy Scouts.

If I have 1 goal for my tenure as your president, it's to boost our visibility and hopefully our membership through a community activity specifically created by PARK. Other activities we do for the community are worthy too. I would like to make sure that PARK gets the visibility we deserve.

ACTIVITIES

Outreach and Education Steering Committee

By Asif Ahmed K5SIF
activies@k5prk.net

- 1st Monday 7:00 PM PaRK Board of Directors Meeting
- 3rd Monday 7:00 PM PaRK General Meeting
- CollinARES Training Nets; Go to www.collinares.net for link and details.
- Weekly PARK "Casual" Net, Wednesdays at 2000 local on PARK Repeater (K5PRK) 147.180 (+) 107.2.
- Digitally Speaking Net – Sunday@2pm – 147.12 Repeater Richardson ARC
- Texas Statewide DMR Net – Wed@7:30pm – 440.375 DMR Repeater TG3148 Richardson ARC
- DARC ECOMM Net 2nd Monday each month at 19;00 CT https://w5fc.org/club-activities/event-calendar
- DARC Geek Net 4th Monday each Month at 19:00 CT
- ARRL NTS Traffic Net Dail 18;30 Local Time

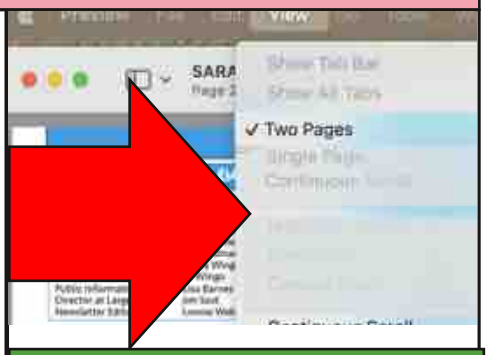
- Wednesday Nights 20:00 ET. Feld Hell Club 10.142MHZ
- VHF-UHF FT8 Activity Contest-NA APR 9th 70CM 0000Z-0500Z
- NCCC FT4 Sprint:MAR 20 to 2400Z, APR 5
- Walk for the Bacon QRP Contest CW Mar 19th 20M 0000-0100Z
- Walk for the Bacon QRP Contest CW
- Apr 2 19th 40M 0200-0301Z
- McKinney ARC Sidewalk Sale, Last Saturday of the Month
- Garland ARC Swap Shop3rd Saturday of the month.

Additionally,

- Hands on mentoring will include BJ's Antenna builds, Tim's Satellite Work and Dave's CW expertise.
- May 16 is N5SAC's Technician License Prep Class & Test.
- June 27 is N5SAC's General License Prep Class & Test.

You can count on me to facilitate. reach out to me at activies@k5prk.net or groups.io.

On the cover: *Anya Ahmed seen operating Asif Ahmed K5SIF's rig in Plano, TX.*
[Photo courtesy Anya Ahmed]



UPCOMING SPEAKERS

By Bruce Cameron K6IL
VP@k5prk.net

I appreciate everyone's patience with our speaker's list. So far, we've done well.

April Tony Fuller—FlexRadio

May our own **Tim Johnson K5TCJ**—working satellites

June—Field Day

July—Auction

August Bruce Cameron—AF Mars

September Edison Fong—his new Triband Beam

October—Open

November—Open

December—Christmas Party

If anyone knows of someone or you might want to present, please let me know.

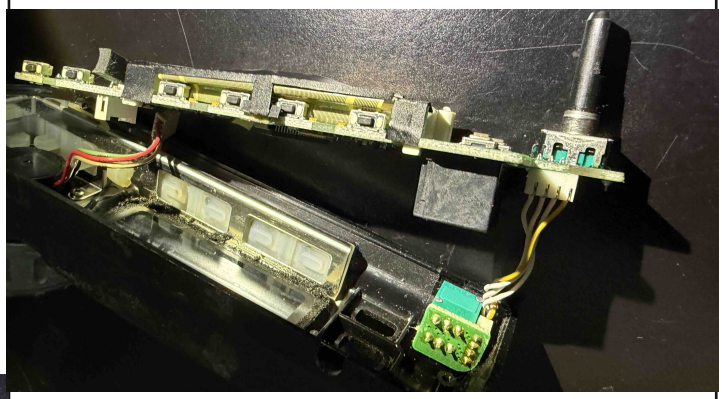
Next Meeting: April 20, 2026

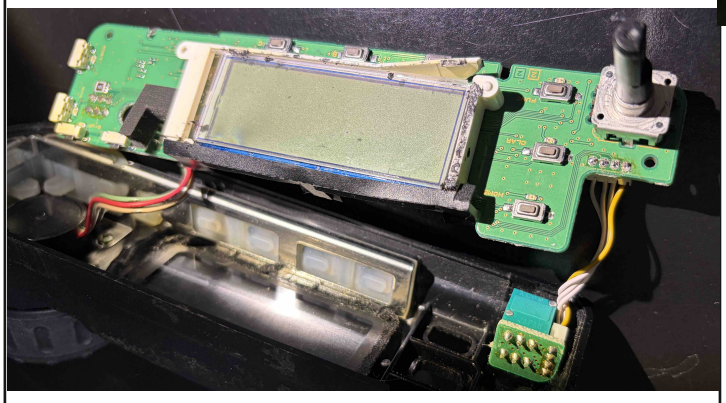
What I did with my Christmas Party HRO gift certificate!

By Neil Gould NE5IL
neil@neilgould.com

I have had a Yaesu ft-857 for at least 20 years. For ~10 years the radio has been unusable due to the very common, 'zebra' screen issue.

There are plenty of videos of fixing this issue by replacing just the LCD panel or resoldering the contacts. I tried this but made it unusable.



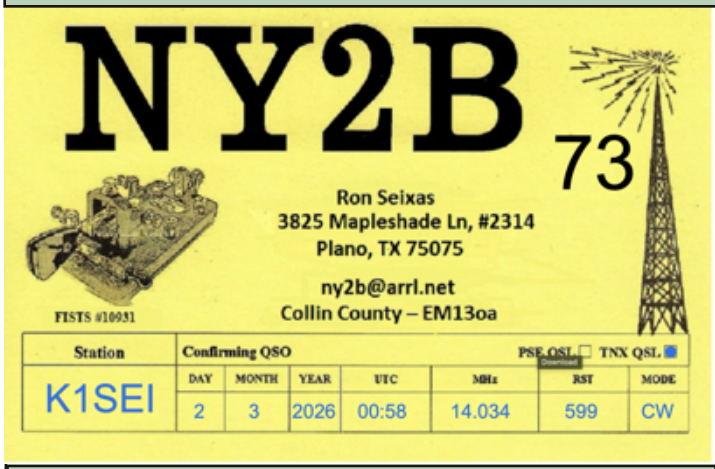


HRO had the complete OEM module available for $200. I was not ready to spend that much but with my $100 gift certificate, I got it for half price! Here is the new one ready to install.

$100 would not buy much at HRO on its own but now I have a fully working HF/VHF/UHF portable radio! ready for POTA or Field Day!

Thanks PARK! 73

QSL CARDS



GECOA FREQUENCIES

By Fred Bates Jr N5FBJ
N5QNS406@gmail.com

At the International Amateur Radio Union (IARU) Region 1 meeting in 2005, it was decided that certainfrequencies on certain amateur bands would be designated as "Global Emergency Center Of Activity" (GECOA)frequencies.

The purpose of establishing the GECOA frequencies was to designate a place for passing emergencytraffic on amateur frequencies, should the need arise. Over the next few years, Regions 2 and 3 followed suit in making the following frequencies worldwide GECOA frequencies. Those frequencies are:

21.360 MHz
18.160 MHz
14.300 MHz
7.240 MHz
7.060 MHz
3.985 MHz
3.750 MHz

These and other frequencies, with their band plans, can also be viewed at www.iaru-r2.org/band-plan.

AUSTRAL ISLANDS

March 23
I just worked TX5EU Austral Islands on 12 meters. 24,955.0 He's listening up 5.

Nice readable signal here.

Tim Johnson K5TCJ
k5tcj@hotmail.com

PARK BOARD OF DIRECTORS MEETING MINUTES

Plano Amateur Radio Klub
Board of Directors Meeting
April 6, 2026

Present:

Mike Tharp KG5TJF, President
Bruce Cameron K6IL, Vice President
Damon Koch K5OCH, Secretary
B. J. Watkins K5BJW, Treasurer
Rob Forson K5WFR, Public Relations Director
Tim Johnson K5TCJ, Immediate Past President
James McCormick KG5KBP, Webmaster
Lonnie Webb KG5WHQ, Newsletter Editor

Absent:

Asif Ahmed K5SIF, Activities Director
Miranda Schwarck KE5YZP, Communications Director

President

Brought meeting to order at 7:14 PM

Vice President

Updated program schedule:
April – Tony Fuller - Flex Aurora presentation
May – Tim Johnson Amateur Satellites
June – Field Day
July – Club auction
August – Air Force MARS
September – Ed Fong and a new tri-band antenna design
October open (officer elections)
November open
December – club Christmas party

Secretary

March club meeting minutes posted to the board.
Typo (incorrect month of February on the March board minutes) fixed and March BoD minutes updated on groups.io.

Treasurer

Treasurer report presented.
All insurances paid, storage paid for a year. Storage comes to $58/month. Paid through April 2027
Digital Ocean is still not debiting our PayPal account.

Public Relations

Rob has gathered 130 email addresses for scout troops, school groups, and private schools. Rob will reach out to them for Field Day. We need to ensure we have people available at field day to speak with possible visitors. Ideas are digital modes (FT8 demo or waterfall running), a local park fox hunt, area club high-altitude balloon launch, weather balloon tracking, etc. Also putting flyers together to hand out locally and have available for guests. Student feedback indicates the club should set up an Instagram account and investigate Discord.

Communications

N/A absent

Activities

n/a absent

Website

All newsletters prior to 2026 have been moved to a directory that requires login to access.
All email forwarding is resolved. The PayPal link is disabled on the website.
We are looking at alternate hosting providers that provide hosting free for non-profits.

Newsletter

Please submit your ideas, pictures, and articles to the newsletter.

Old Business

Acceptable use policy is still in work. Will revisit next month.
PicRights issue
All newsletters prior to this year have been moved to a directory that requires login to access.
We will no longer respond to them until we hear from legitimate legal counsel. Their last communication was an email demand to wire a bank account in Switzerland. This reeks of scam.
The club needs to explore running split tone on VHF so we can raise transmit power. We can hold a clinic to help reprogram radios. Discussion on hold for now.
REACT: The area hospitals have a REACT requirement for integrating amateur radio into their emergency plans and drills. How can the club leverage this? Discussion on hold for now.

New Business

We are setting up a new email address on the website, fieldday@k5prk.net that will forward to **Rob Forson K5WFR**.

Adjourn

Mike motioned to adjourn, Rob second. Adjourned at 7:55 PM

MEETING MINUTES

March 16, 2026 General Meeting Minutes

Call to Order at 7:03 p.m.

President Mike Tharp KG5TJF

- Opened the meeting with the Pledge of Allegiance and roll call.
- 26 present, 21 members 5 guests.

Vice President Bruce Cameron K6IL

- March: **David Donaldson, KA5SOC** - The HF J-pole Project
- April: Tony Brock Fisher – FlexRadio
- May – TBA
- June – Mike Tharp – Field Day
- July – PARK Auction
- August - Bruce Cameron – Air Force Mars
- If you would like to present, please email me at VP@k5prk.net

Secretary Damon Koch K5OCH

- March board minutes are posted.

Treasurer B. J. Watkins K5BJW

- Finance report presented.

Communications Director Miranda Schwarck KE5YZP

- Miranda brought in the new Winlink gateway computer with passive cooling and associated JetKVM interface. She will install it at the tower site as soon as schedule allows.

Newsletter Editor Lonnie Webb KG5WHQ

- Please submit your ideas, pictures, and articles to the newsletter.

Public Relations Director Rob Forson K5WFR

- Field Day 2026 – Continuing work to obtain lists of local home schools and Scout troops to send invitations to our Field Day.

Webmaster James McCormick KG5KBP

- We are removing PayPal from the website. We still have square payments available through Ham Club Online.

Activities Director Asif Ahmed K5SIF

- The Sachse *[N5SAC]* club is hosting two license classes this spring:
  - **Class:** Technician License Prep Class
    - Date: **May 16, 2026**
    - Time: 9a--approx 6p
    - Location: Sachse EOC at Fire Station 1, Sachse, TX
    - Lunch is provided
    - A cost may be required for materials.
    - URL: https://tinyurl.com/techclass2026
  - **Class:** General License Prep Class
    - Date: **June 27, 2026**
    - Time: 9a--approx 6p
    - Location: Sachse EOC at Fire Station 1, Sachse, TX
    - Lunch is provided
    - A cost may be required for materials.
    - URL:https://tinyurl.com/generalclass2026
- Outreach and Education Steering Committee – Volunteers still needed! Thank you **Neil NE5IL** for being our first volunteer. Contact **Asif K5SIF** at KG5CUX@gmail.com or Groups.io post to help.
- Local activities list is printed in the newsletter.

VE Coordinator Daryl Morgeson AF5QJ

- No testers tonight.
- Interested in informal Saturday morning breakfast? We meet at Poor Richard's SE corner of Park and Ave K at 7:00 AM.

Field Day Mike Tharp KG5TJF

- Russel Creek Pavilion reserved for Field Day.

Old Business

- None

New Business:

- The club received a letter of Copyright violation for using Family Circus and Dennis the Menace cartoons that pertain to radios in old newsletter articles. The cartoons have been removed. The company is threatening the club with $700 in fines. The club noted that the letter was threatening, but not sent by a lawyer and not registered. We choose to wait for further contact and a chance to negotiate a smaller or waived fine.
- Extra Space storage fees have more than doubled. B.J. researched and found alternatives, the best being a locally owned storage facility that can give us a much better deal on a climate controlled 5x10 space for $766 for 13 months. **Larry KI5UXC** motioned to move our storage to Alpha Self Storage, second by **Lonnie KG5WHQ** and passed by unanimous vote.
- A motion was raised by **Larry KI5UXC** to reimburse Mike Tharp $450 for Field Day pavilion rental at Russel Creek Park. Second by **Bruce K6IL** and passed by unanimous vote.

Break

- New Member
- Welcome **Mark Johnston, K5LOD**.
- **50/50 Raffle**
  - Won by **Ayan KJ5FMR**.

Program

David Donaldson KA5SOC – The HF J-pole Project

Adjourn at 8:28 PM .

FCC: Action Against Amateur. Made Baofeng Parrot on EmComm Frequency

somsomethinglkdjsfhlkajhsdfk
Communications Commission
Enforcement Bureau
Region One

Region One Regional Office
9050 Junction Drive
Annapolis Junction, Maryland
20701
301-725-1996
field@fcc.gov

March 25, 2026
BY CERTIFIED MAIL, RETURN RECEIPT REQUESTED,
FIRST CLASS MAIL AND UPS

David O. Knudtson
125 North Balph Avenue
Pittsburgh, PA 15202

NOTICE OF UNLICENSED OPERATION AND NOTIFICATION OF HARMFUL INTERFERENCE

Case Number: EB-FIELDNER-25-00039052

The Federal Communications Commission (FCC or Commission) received a complaint from Allegheny County Pennsylvania Emergency Services (Allegheny County) concerning interference to its 911 emergency communications channel operating on 470.4375 MHz in Pittsburgh, Pennsylvania. On July 30, 2025, Agents from the Columbia Office of the FCC's Enforcement Bureau (Agents) conducted an investigation and determined, using direction finding techniques, that the source of the interference to the Allegheny County system was a signal emanating from the residence of David O. Knudtson (Knudtson), licensee of amateur radio station KD3ASC. After the Agents notified Knudtson of the interference issue, he produced a handheld radio (identified as a BTech UV-Pro). An examination of the radio determined that it had been modified to monitor the Allegheny County channel, and its "Audio Relay" feature had been activated. This feature turned Knudtson's radio into a simplex repeater that was retransmitting the Allegheny County channel. Knudtson surrendered the radio to the Agents. Subsequently, the Agents verified that the interference to the Allegheny County system had ceased.

Radio stations, including those operating on 470.4375 MHz, must be licensed by the FCC pursuant to the Communications Act of 1934, as amended (Act) and Section 1.903(a) of the Commission's rules (Rules). The only exception to this licensing requirement is for certain transmitters using or operating at a power level or mode of operation that complies with the standards established in part 15 of the Rules. Non-licensed operation pursuant to part 15 of the Rules, however, is conditioned upon compliance with all applicable regulations in the subpart. All intentional radiators operating pursuant to part 15 of the FCC's Rules must be certified for use as a part 15 device. and failure to operate such device consistent with its authorization violates part 15 of the Rules.

Section 97.301(a) of the Rules lists the frequency bands that are available for an amateur radio operator like Knudtson who holds a Technician class amateur radio license. The investigation determined that Knudtson transmitted on a frequency outside of these bands. Specifically, on July 30, 2025, Knudtson operated on 470.4375 MHz, and therefore, he operated without the required authorization for that frequency in violation of section 301 of the Act, and sections 97.301(a) and 1.903(a) of the Rules.

Finally, section 333 of the Act states that "[n]o person shall willfully or maliciously interfere with or cause interference to any radio communications of any station licensed or authorized by or under this chapter or operated by the United States Government" and section 97.101(d) of the Rules states that "[n]o amateur operator shall willfully or maliciously interfere with or cause interference to any radio communication or signal." Agents identified an amateur radio in Knudtson's possession as the device transmitting on frequency 470.4375 MHz and causing harmful interference to Allegheny County's licensed public safety radio communications system. Consequently, Knudtson's operation of his device was in violation of section 333 of the Act and section 97.101(d) of the Rules.

You are hereby warned that operation of radio transmitting equipment without a valid radio station authorization and that causes harmful interference constitutes a violation of the Federal laws cited above and could subject the operator to severe penalties, including, but not limited to, substantial monetary fines, in rem arrest action against the offending radio equipment, and criminal sanctions including imprisonment. Because unlicensed operation

creates a danger of interference to important radio communications services and may subject the operator to severe penalties, this letter emphasizes the importance of complying strictly with these legal requirements.

UNAUTHORIZED OPERATION OF THIS RADIO STATION AND ASSOCIATED HARMFUL INTERFERENCE MUST BE DISCONTINUED IMMEDIATELY AND MUST NOT RESUME.

You have ten (10) days from the date of this notice to respond describing the steps you are taking to avoid operating on unauthorized frequencies and preventing future interference. Your response should be sent to the address in the letterhead and reference the listed case number. Under the Privacy Act of 1974, we are informing you that the Commission's staff will use all relevant material information before it to determine what, if any, enforcement action is required to ensure your compliance with Rules. This will include any information that you disclose in your reply.

You may contact this office if you have any questions.

David Dombrowski
Regional Director, Region One
Enforcement Bureau

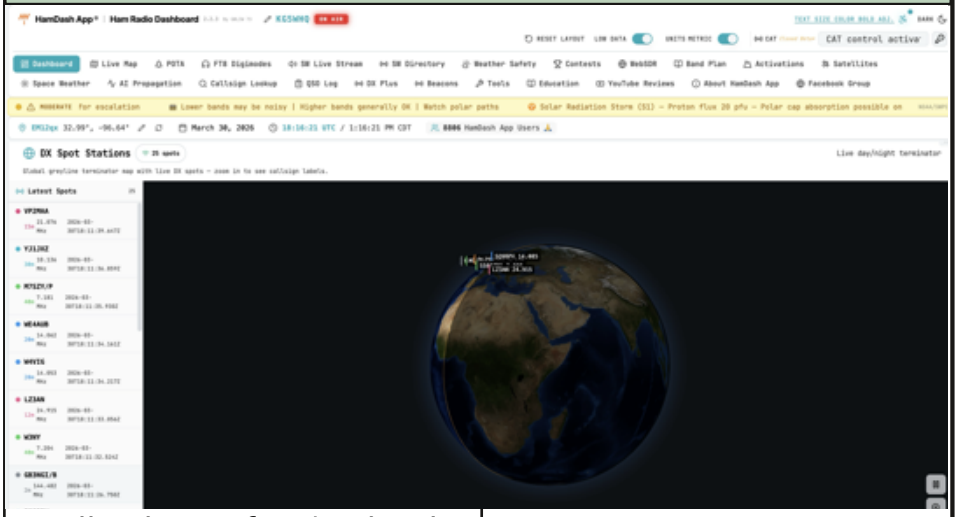
Enclosures:
Excerpts from the Communications Act of 1934, As Amended

Source: FCC. Editted to remove footnotes and formatting.

If you have a UV PRO with "Audio Relay" turned on, do not enable an emergency frequency to transmit. For that matter, be cautious of and beaconing on a given frequency.

Always know who is operating on your frequency in that situation. —ed

CHECK OUT HAM DASH



Fellow hams! If you're already behind the mic chasing DX, working contests, or activating parks/summits, HamDash is built exactly for operators like you.

HamDash is a free, privacy-first, browser-based dashboard that puts everything you need for real-time operating on one clean screen—no login, no account, no data stored on any server. Just open **https://hamdash.com** and you're in.

What you'll see instantly:

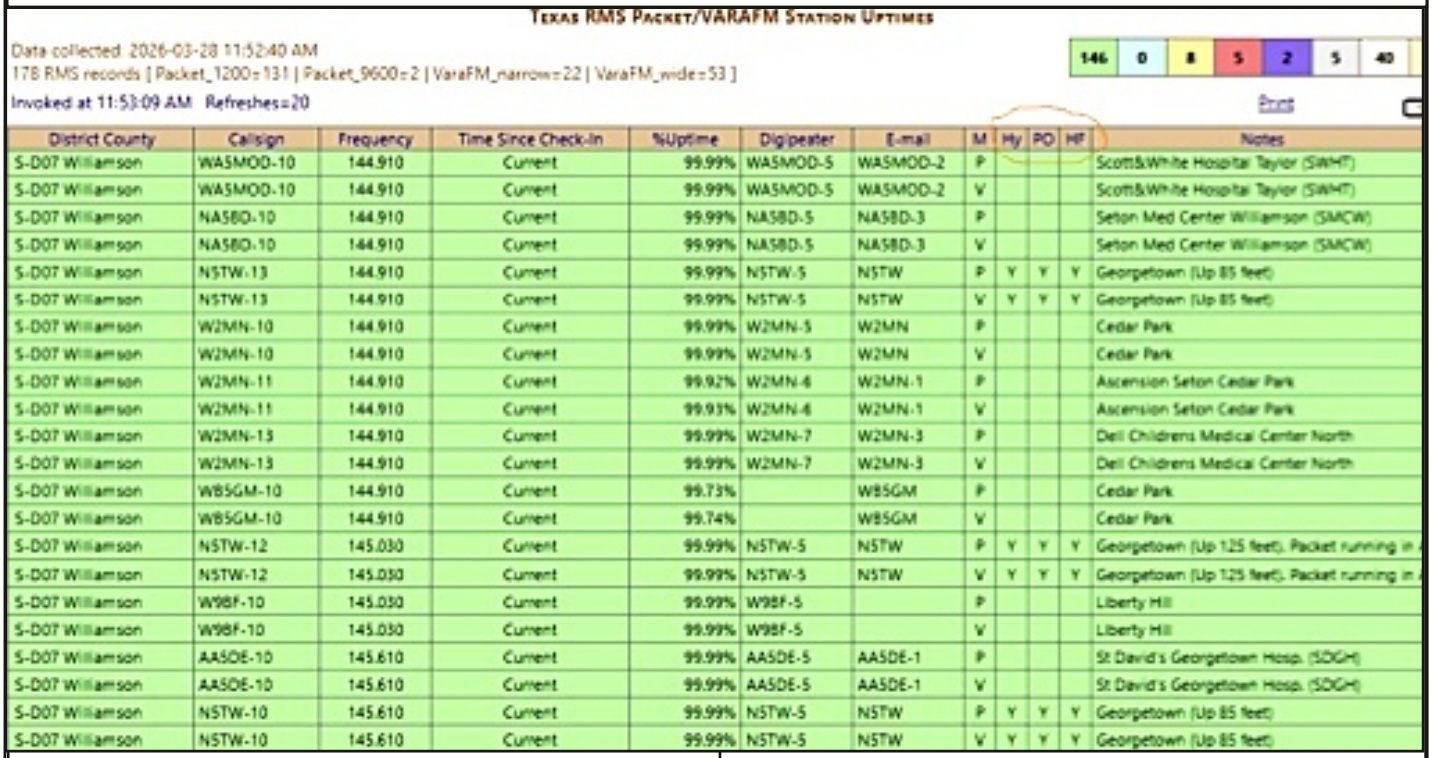
- Live DX cluster spots with a zoomable world map and grey-line terminator
- Real-time band activity and HF propagation conditions (OPEN / PARTIAL / MARGINAL / CLOSED) Predicted band openings for the next 24 hours
- Current space weather (K-index, A-index, solar flux, proton events, etc.)
- Callsign lookup (name, grid, QSL info)
- Local weather + lightning radar for portable/POTA/SOTA ops
- UK/EU weather warnings for antenna safety

Everything updates automatically. It's like a supercharged, always-on HamClock with modern DX tools, built by a licensed radio amateur (G0LIW) for the community.

Beta v2.0 runs entirely in your browser with single-endpoint caching for speed and privacy. Over 9,000 hams are already using it daily.

Just set your grid square once (optional) and you're ready. Bookmark it on your shack computer, tablet, or phone and keep it running in a tab while you operate.

NEW WINLINK FEATURE: POST OFFICE MODE



TEXAS RMS PACKET/VARAFM STATION UPTIMES

Data collected 2026-03-28 11:52:40 AM
178 RMS records [Packet_1200=131 | Packet_9600=2 | VaraFM_narrow=22 | VaraFM_wide=53]
Invoked at 11:53:09 AM Refreshes=20

146 0 8 5 2 5 40

Print

District County	Callsign	Frequency	Time Since Check-In	%Uptime	Digipeater	E-mail	M	Hy	PO	HF	Notes
S-D07 Williamson	WA5MOD-10	144.910	Current	99.99%	WA5MOD-5	WA5MOD-2	P				Scott&White Hospital Taylor (SWHT)
S-D07 Williamson	WA5MOD-10	144.910	Current	99.99%	WA5MOD-5	WA5MOD-2	V				Scott&White Hospital Taylor (SWHT)
S-D07 Williamson	NA5BD-10	144.910	Current	99.99%	NA5BD-5	NA5BD-3	P				Seton Med Center Williamson (SMCW)
S-D07 Williamson	NA5BD-10	144.910	Current	99.99%	NA5BD-5	NA5BD-3	V				Seton Med Center Williamson (SMCW)
S-D07 Williamson	N5TW-13	144.910	Current	99.99%	N5TW-5	N5TW	P	Y	Y	Y	Georgetown (Up 85 feet)
S-D07 Williamson	N5TW-13	144.910	Current	99.99%	N5TW-5	N5TW	V	Y	Y	Y	Georgetown (Up 85 feet)
S-D07 Williamson	W2MN-10	144.910	Current	99.99%	W2MN-5	W2MN	P				Cedar Park
S-D07 Williamson	W2MN-10	144.910	Current	99.99%	W2MN-5	W2MN	V				Cedar Park
S-D07 Williamson	W2MN-11	144.910	Current	99.92%	W2MN-6	W2MN-1	P				Ascension Seton Cedar Park
S-D07 Williamson	W2MN-11	144.910	Current	99.93%	W2MN-6	W2MN-1	V				Ascension Seton Cedar Park
S-D07 Williamson	W2MN-13	144.910	Current	99.99%	W2MN-7	W2MN-3	P				Dell Childrens Medical Center North
S-D07 Williamson	W2MN-13	144.910	Current	99.99%	W2MN-7	W2MN-3	V				Dell Childrens Medical Center North
S-D07 Williamson	WB5GM-10	144.910	Current	99.73%		WB5GM	P				Cedar Park
S-D07 Williamson	WB5GM-10	144.910	Current	99.74%		WB5GM	V				Cedar Park
S-D07 Williamson	N5TW-12	145.030	Current	99.99%	N5TW-5	N5TW	P	Y	Y	Y	Georgetown (Up 125 feet). Packet running in
S-D07 Williamson	N5TW-12	145.030	Current	99.99%	N5TW-5	N5TW	V	Y	Y	Y	Georgetown (Up 125 feet). Packet running in
S-D07 Williamson	W9BF-10	145.030	Current	99.99%	W9BF-5		P				Liberty Hill
S-D07 Williamson	W9BF-10	145.030	Current	99.99%	W9BF-5		V				Liberty Hill
S-D07 Williamson	AA5DE-10	145.610	Current	99.99%	AA5DE-5	AA5DE-1	P				St David's Georgetown Hosp. (SDGH)
S-D07 Williamson	AA5DE-10	145.610	Current	99.99%	AA5DE-5	AA5DE-1	V				St David's Georgetown Hosp. (SDGH)
S-D07 Williamson	N5TW-10	145.610	Current	99.99%	N5TW-5	N5TW	P	Y	Y	Y	Georgetown (Up 85 feet)
S-D07 Williamson	N5TW-10	145.610	Current	99.99%	N5TW-5	N5TW	V	Y	Y	Y	Georgetown (Up 85 feet)

By Tom Whiteside N5TW

My main purpose is to discuss a new Winlink Post Office mode that I believe is a very important addition to our capabilities. I also want to announce some changes to our Texas RMS Packet / VARA FM Status website and request our Winlink SYSOPS to send me any updates related to their stations for inclusion on this website.

If you are not familiar with this website, it can be found at PacStat Uptime Data (http://n5tw.ecpi.com/rmsstatus/).

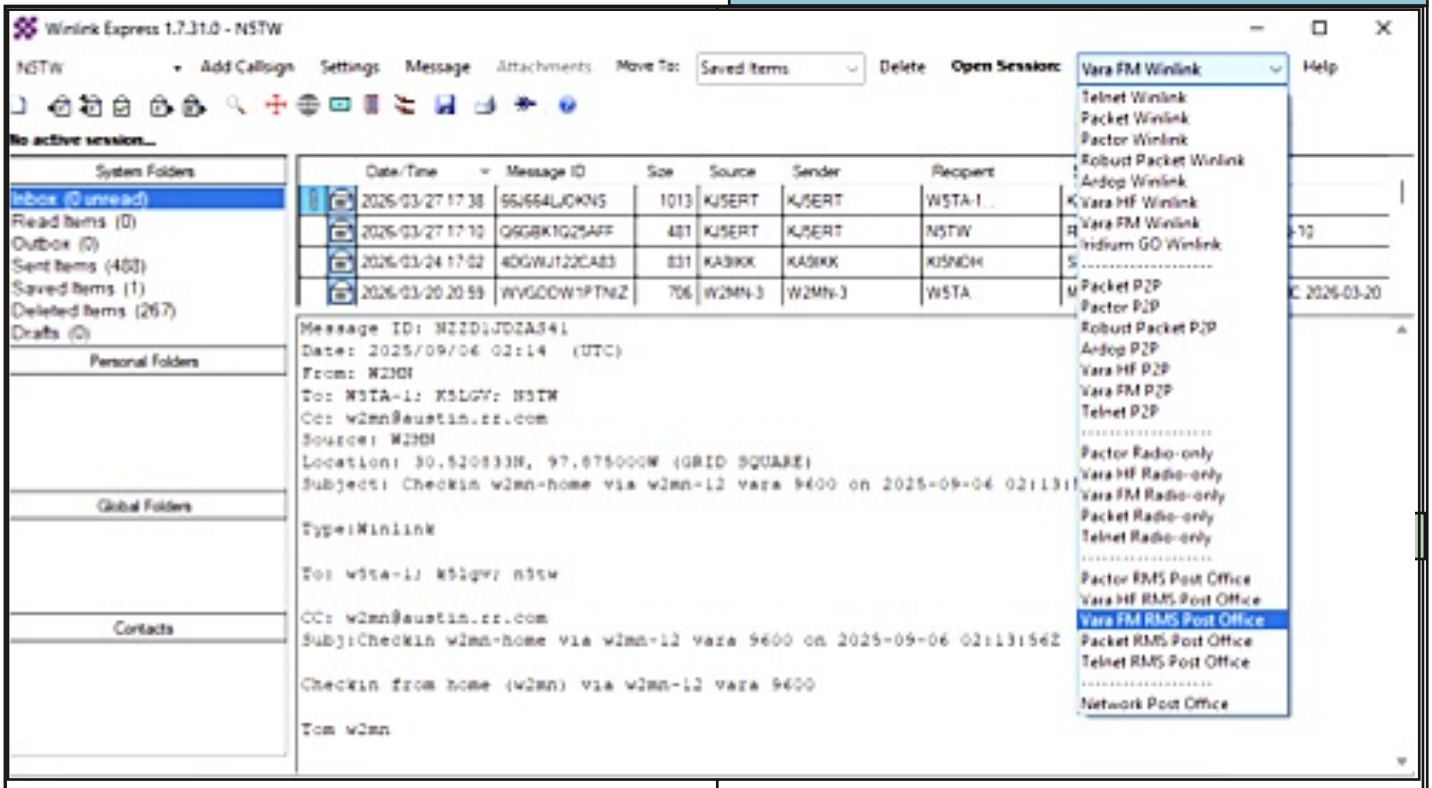
We have 178 stations in the database and 146 were active when I took this screenshot - active stations show up in green. I have removed the column that indicated RMS Relay status and added three columns you can see below within the red circle. Hovering the curser on these abbreviations will give you their full names. Hy stands for Hybrid, PO stands for Post Office and HF stands for HF forwarding. A "Y" in the column indicates that stations supports that capability. My N5TW stations support all three as you can see below. I will say more below about each of these modes... (Photo)

The new Post Office mode allows depositing mail for other Winlink users with stations that support Post Office Mode. These messages are stored locally and have NO dependency on the Internet. This new mode is MUCH more powerful than sending Peer to Peer traffic. Unlike Peer to Peer where both users must be on the same frequency with the same mode at the same time, Post Office messages can be sent and received when convenient. In my opinion, this new Post Office mode should eliminate most uses of Peer to Peer where this is support for it.

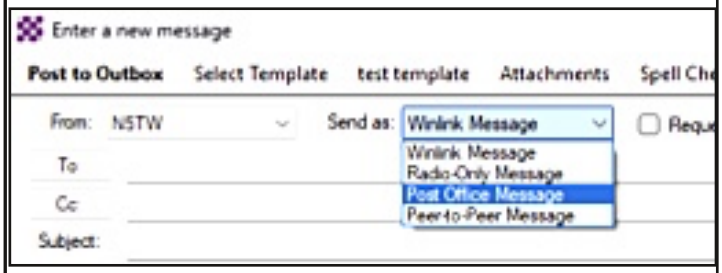
"It is important that Post Office messages be of the proper type"

All this requires is running a Winlink Program called RMS Relay and referencing RMS Relay in the Winlink node. My station, for example, does this for three instances of RMS Packet (for VHF Packet and VARA FM) and two instances of RMS Trimode (for PACTOR or VARA HF). This means you can send Post Office traffic to any of my stations whether they are operating on VHF or HF and recipients can pick up there mail from any of my stations - they don't need to use the same mode.

The following screenshot showing how to open a Post Office session—in this case, a Vara FM RMS Post Office session:



It is important that Post Office messages be of the proper type. Below, you can see how to select the proper message type.



Both the sender and the recipient must connect using Post Office sessions to pass traffic.

Hybrid Mode

Let me shift gears to discuss Hybrid Mode which has existed for a number of years. A relatively few of the HF Winlink stations are set up to support Hybrid mode. This is intended as a "Dooms Day" mode with a total internet outage. Users can, in advance, select up to 3 stations as Message Pickup Stations or MPS. Radio-only traffic deposited with a Hybrid Station will be routed over HF to the MPS associated for a given user. Please limit the number of MPS stations you register with your call to limit the amount of traffic that has to be handled!

I have had stations deposit radio only messages for 20 stations each often with more than 1 MPS - this one piece of traffic could tie the poor hybrid station for a whole day and hog a lot of HF bandwidth! Imagine when this happens on an RTTY contest weekend! Please limit any Radio-only traffic!!!

HF Forwarding

The final column if a "Y" for Yes is present, it means that that station is capable of hubbing local traffic for users in an internet outage as well as forwarding traffic outside the area to a station that does have the internet. This is a highly useful feature that has been supported for a quarter century.

In conclusion:

Sorry for being long-winded but wanted to make sure everyone knows about this new Post Office mode and the changes in the Texas RMS Status webpage. Let's work to make support for this widespread and to familiarize yourselves with its operation. By the way, I would NOT setup every station in an area as Post Office capable to avoid confusion about where to drop off and pickup mail.

#Do you need remote shell access or just anonymity?

In an age when most online communities flicker out after a few years, one bastion has stood defiant for nearly four decades. Welcome to SDF.org—the Super Dimension Fortress Public Access UNIX System, a living relic of the pre-web internet that began in 1987 and is still thriving in 2026 as a vibrant, volunteer-run non-profit (501(c)(7)) social club.

Born on an Apple IIe as a BBS for fans of the anime Super Dimension Fortress Macross, SDF evolved from humble bulletin-board roots into a full-fledged multi-user UNIX environment. It has survived hardware upgrades (from Coherent to NetBSD on DEC Alpha and beyond), relocations, and the rise (and fall) of countless commercial services. Today it remains exactly what it always promised: a pure, ad-free public-access UNIX system where anyone can log in, tinker, chat, and create—much like the early days of ARPANET or Usenet, but with modern twists.

A Shared Digital Playground

At its heart, SDF is a real, living UNIX server (running NetBSD) that hundreds of members share simultaneously. You get a genuine shell account—no virtual machines or containers, just the raw command line experience that Unix veterans and curious newcomers alike crave.

Free USERS level (the starting point for everyone) includes:

- Full SSH shell access with your choice of shells (bash, zsh, tcsh, and more)
- Email, webmail, Usenet news, IRC, Gopher, and classic telnet
- Personal web hosting with CGI support
- Built-in BBS (BBOARD), real-time COMMODE chat, and a library of command-line games and MUDs

Access to tutorials, a user map, photo gallery, and Git hosting

It's the perfect sandbox for learning Unix, running scripts, hosting small sites, or just hanging out in the terminal with like-minded souls.

For those who want more, two optional paid tiers unlock additional power while directly supporting the system's upkeep:

- ARPA ($36 one-time lifetime fee) adds voting rights on new features and policies, DNS registration perks, and a host of advanced tools.
- MetaARPA ($11 per quarter on top of ARPA) brings even richer capabilities: cron jobs, SSH tunneling, private VPS-like slices, NextCloud file sync, a massive disk array, rsync backups, dynamic DNS, Lisp environments, and the ability to sponsor new free users.

All tiers remain gloriously free of ads, tracking, or corporate oversight—funded purely by the community.

Retro Wonders and Modern Surprises

What truly sets SDF apart is its dual personality: it's both a nostalgic time capsule and a forward-looking clubhouse.

The vintage computing cluster is legendary. In 2026, SDF partnered with the Interim Computer Museum to open connect.sdf.org, where anyone can browser-log into 28 historic systems for free. Want to play with Multics from 1964, classic TOPS-20 PDP-10 machines (complete with the iconic @ prompt), Symbolics Lisp Machines, or ITS? They're all there, alive and interactive. Many of these run directly on SDF's hardware too—TWENEX, Genera, and more—letting members jump between eras with a single SSH command.

On the modern side, SDF runs its own Fediverse instances (Mastodon at mastodon.sdf.org, plus Pixelfed and others), a Minecraft server, Gopher hosting (one of the last bastions keeping the protocol alive), and even experimental services like Plan 9 from Bell Labs. There are extensive tutorials (both wiki-based at wiki.sdf.org and classic HTML guides) covering everything from basic shell use to advanced topics like VoIP, dial-up, and retro-computing.

Joining the Fortress

Getting started couldn't be simpler or more old-school:

Head to https://sdf.org/?signup and create your free shell account via SSH.

Once inside, a quick $1 validation (or sponsorship by an existing ARPA/MetaARPA member) activates full access.

Upgrade to ARPA or MetaARPA anytime through the store if you fall in love with the place.

Everything is documented on the clean, retro-style site (https://sdf.org) with links to the tour, FAQ, live status page, member directory, and tutorials. New users are welcomed warmly—many longtime members happily mentor newcomers.

Why SDF Endures

In a world of polished apps and fleeting social networks, SDF.org feels like stepping into a cozy, wood-paneled library where the books are alive and the patrons are typing away on green-screen terminals. It's a place for programmers, students, artists, historians, and anyone who simply enjoys the command line. No algorithms, no paywalls on the basics, no surveillance—just people, code, and conversation.

Nearly 40 years on, SDF proves that the spirit of the early internet never really died; it just moved to a fortress in the cloud (and on real vintage iron). If you've ever wanted to experience what the internet felt like before everything went corporate—or if you just need a quiet corner of the net to learn, build, and belong—log in. The door is always open, and the fortress still stands strong.

Ready to join?

Visit https://sdf.org and type ssh new@sdf.org (or follow the signup link). Welcome to the club.TBD.

Dive a couple of layers into the archive of information on the sdf and you will find an amazing archive of the sdf ham radio club and conversations. I joined the sdf and set up a very bad web site (http://lwdallas.sdf.org).

NEWS AND UPDATE FROM THE EHN

We are fast approaching our first Milestone, please read and share our News. First, a big thank you to everyone who has taken the time to sign up on our website. Your support means a great deal.

As of March 29th—just shy of April Fools' Day—we reached 43 members, just a few short of our geol.

That's a fantastic milestone and a strong start for the project.

What We've Achieved So Far

Over the past few weeks, we've made solid progress:

1. We now have 40+ members engaged and interested in the project
2. We've launched an SMS Meshtastic bridge, allowing Meshtastic users to send and receive text messages via an Android phone
3. We've developed a growing documentation pack, defining the architecture and how the system fits together
4. We've reached out to the ARRL multiple times for guidance, including a formal inquiry regarding special licensing—so far, we have not received a response

Overall, this is strong progress for a small but motivated group.

What Comes Next

Our priority now is simple: growth and engagement. To move forward, we need to:

- grow our membership
- expand awareness of the project
- build stronger connections with organizations like the ARRL
- attract more IoT developers and technical contributors

We also plan to continue developing practical demonstrations of the architecture, including:

- a MeshCore SMS bridge
- further work toward APRS and Winlink integration
- determining if we need a FCC experimental license

For now, we are focusing on public systems to avoid regulatory complications while we build out the concept.

How You Can Help

We're now asking members to get involved in any way they can:

- share the project and help spread the word
- support social media and outreach efforts
- encourage engagement with organizations like the ARRL

- test released tools and provide feedback

We are also looking for members who want to take a more active role, including:

- participating in regular online meetings
- contributing to development, documentation, or testing

A Note on AI

Some feedback has questioned our use of AI in generating content and images.

To be clear:

- We use AI as a tool, not a replacement for thinking.
- As experienced engineers, we treat AI as part of the team—subject to review, validation, and refinement. It helps us explore ideas faster and focus on the most important challenges.

Final Thoughts

We've proven there is interest. Now we need to build momentum.

If you're part of **Emergency-Ham.Net**, we encourage you to think about how you'd like to contribute—whether that's sharing the idea, testing systems, or helping shape the architecture.

Thank you again for helping us get this far.

MAGNETIC NORTH POLE MOVING TO SIBERIA

Earth's Magnetic North Pole Is Shifting Toward Siberia and Raising Questions About Unusual Movement

Ever wonder why the GPS system has to be constantly updated? Scientists just dropped an update to the map that tracks the moving magnetic north pole. It matters for GPS, planes, ships, military movement, and firing munitions.

Magnetic North is Now in Siberia

The magnetic north pole is NOT the same as the regular North Pole on a map. It's where Earth's magnetic field lines meet up, and it moves because of hot liquid iron spinning deep inside the planet's core.

For decades, it was drifting slowly from Canada toward Russia. But this century, it sped up significantly — from about 6 miles a year to a peak of 31 miles a year in the 2000s. Now it's slowed down to about 22 miles a year. That's the "biggest deceleration in speed we've ever seen," according to William Brown, global geomagnetic field modeler at the British Geological Survey. Brown put it simply: "The current behavior of magnetic north is something that we have never observed before."

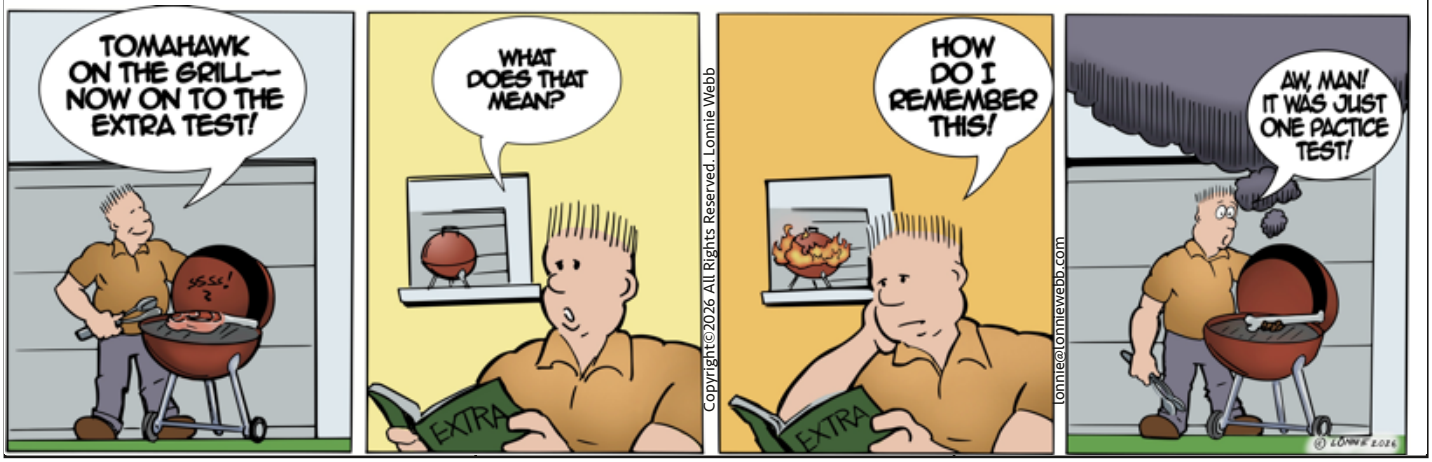
They update the World Magnetic Model every 5 years so navigation systems stay accurate. The latest one (December) shows the pole is now closer to Siberia than before.

If you don't update the model, your GPS or compass can be off big time. "The more you wait to update the model, the larger the error becomes," said Arnaud Chulliat, senior research scientist at the University of Colorado Boulder and NOAA's National Centers for Environmental Information. Fly from South Africa to the UK using the old model, and you'd end up 93 miles in the wrong spot.

Nobody knows exactly why it sped up then slowed down. Some think the magnetic field is getting weaker in Canada but stronger near Siberia, so the pole gets pulled that way. "That pulls the magnetic pole towards Siberia," says Ciarán Beggan, geophysicist at the British Geological Survey.

The Earth's magnetic field has also weakened by about 9% in the last 200 years. That makes some people wonder about a full pole flip (north and south swapping), but the last one was 780,000 years ago, and no one's saying it's about to happen.

MIKE CALL BY LONNIE WEBB



The Earth Has Indigestion

The explanation for this behavior could be as simple as the remnants of Theia, the small planet described in the Giant Impact Hypothesis, could be in motion. The theory states that a hypothetical proto-planet smashed into the early Earth about 4.5 billion years ago and can still be seen in twisted enormous shapes wrapped around and through the Earth's core.

Bottom line: the pole might speed up again or change direction—they are watching. "It could change."

Sources: https://www.smithsonianmag.com/smart-news/earths-magnetic-north-pole-is-shifting-toward-siberia-and-raising-questions-about-unusual-movement-180985892/ https://www.ncei.noaa.gov/news/2025-wmm-annual-report-released/

ANNUAL ARMED FORCES DAY CROSSBAND TEST

(9 May 2026)

The Department of Defense will host this year's Armed Forces Day (AFD) Crossband Test, scheduled for May 9, 2026. This annual event is open to all licensed amateur radio operators and will not impact any public or private communications. For more than 50 years, military and amateur stations have taken part in this event, which is an interoperability exercise between hobbyist and government radio stations.

The AFD Crossband Test is a unique opportunity to test two-way communication between military communicators and radio stations in the Amateur Radio Service (ARS), as authorized in 47 CFR 97.111. These tests provide opportunities and challenges for radio operators to demonstrate individual technical skills in a tightly controlled exercise scenario that does not impact any public or private communications.

Military stations will transmit on selected military frequencies and will announce the specific ARS frequencies monitored. All times are ZULU (Z), and all frequencies are Upper Side Band (USB) unless otherwise noted. The frequencies used for the test will not impact any public or private communications and will not stray outside the confines of the exercise.

The following stations will be making two-way radiotelephone contacts with stations in the ARS between the time periods listed on the frequencies listed in Kilohertz below.

AAC / BARROW ARMY RESERVE CENTER, KY (USB + RTTY)
09May 1100Z – 10May1100Z 4,011.0 kHz USB 5,346.5 kHz USB 6,968.5 kHz USB 13,963.5 kHz USB 17,457.5 kHz USB
AAM3D / DISA CYBERSPACE OPERATIONS DIRECTORATE, FT MEADE, MD
0800Z – 2000Z 5,112.0 kHz USB 7,431.5 kHz USB 14,484.0 kHz USB 18,639.0 kHz USB 20,920.0 kHz USB
AAM3D1 / DISA HEADQUARTERS, FT MEADE, MD
0800Z – 2000Z 5,760.0 kHz USB 7,718.5 kHz USB 14,512.5 kHz USB 18,211.0 kHz USB
AAM3D4 / DISA FIELD COMMAND CENTCOM, MACDILL AFB, FL
0800Z – 2000Z 5,763.0 kHz USB 7,498.5 kHz USB 14,463.5 kHz USB 18,254.0 kHz USB
AAN / U.S. NORTHERN COMMAND, CO
1300Z - 2100Z 6,970.5 kHz USB 14,550.5 kHz USB
AAZ / FT HUACHUCA, AZ
1500Z - 2359Z 7,645.0 kHz USB 14,438.5 kHz USB
ADB / CAMP FOSTER, OKINAWA
1500Z - 22590Z 14,487.0 kHz USB 20,994.0 kHz USB

For the full press release go to: https://www.dodmars.org/mars-comex-information-website/armed-forces-day

For those who wish to document their contacts with a QSL card, go to https://www.usarmymars.org/events and complete the request form.

JOIN THE ARRL

American Radio Relay League (ARRL) is the leading organization for radio enthusiasts across the United States. The ARRL invites you to join a vibrant community of innovators, communicators, and explorers who connect the world through the airwaves. Whether you're passionate about emergency communications, cutting-edge technology, or simply connecting with fellow hams across the globe, the ARRL offers unparalleled resources, training, and opportunities to fuel your curiosity.

By becoming a member, you'll gain access to exclusive publications like QST, hands-on support for licensing and operating, and a network of over 150,000 members who share your passion.

ARRL has an active lobby in government and aggressively acts for our benefit sharing our voices in Congress.

Additionally, the the ARRL equipment insurance program is quite superior. Investigate it and stor you receipts away in accordance with their requirements. When lightning strikes you will want them.

Join the ARRL today and amplify your voice in a timeless hobby that bridges distances, builds skills, and creates lifelong friendships—your adventure in amateur radio starts here!

The Basic Parts of Supercells Explained

By Tornado Titans, tornadotitans@substack.com
[via Tricia Lindsey K5TIL, tricia@sachsecert.org]

Learn how to read the sky...

Every supercell has the same basic parts. Updraft, forward flank downdraft, rear flank downdraft. You can draw it on a whiteboard, and it looks clean and logical, like a textbook diagram that makes perfect sense.

Then you stand in front of one, and none of it looks like the diagram.

That's the part nobody warns you about. I've been chasing for over 20 years, and I still have moments where I'm staring at a storm trying to reconcile what I'm seeing with what I know is supposed to be there. It happens to us all, weather breaks every rule at least once.

Supercells are structurally consistent in theory and absolutely chaotic in practice. The bones are always the same. The skin is different every single time.

So instead of walking you through a single diagram, I want to show you three real supercells. Three storms I was standing in front of. Each one looks completely different from the others, and that's exactly the point. Once you can identify the same anatomy across storms that look nothing alike, you're seeing what chasers see.

But first, the one thing you need to be able to spot before anything else makes sense.

Learning to spot the updraft is the first essential skill of storm chasing.

The Updraft: Learn This First, Everything Else Follows

I cannot overstate how much of storm chasing comes down to watching the updraft. **It's the engine of the storm.** It's the part that tells you what's about to happen next. If you can find the updraft, you can start reading everything else around it.

So what does it actually look like? Sometimes it looks like a dark cloud mass directly overhead, the kind that makes you instinctively look up and think "that's not friendly." Sometimes it looks like

a towering cumulus column punching into the sky, visible from 50 miles away. And sometimes it looks like a lowered base sitting on the horizon, looking dense and organized and very much alive.

Three very different visuals, same feature. **Find the updraft and you've found the storm's center of gravity.** Everything else orients around it.

Storm #1: The Elegant One (Low-Precipitation Supercell)

I'm looking west at this storm, which is the classic chase position. And this one is gorgeous. Clean structure, easy to read. If supercells had a beauty pageant, this one would be a finalist.

The updraft is right there in front of me. And since I'm looking west, the forward flank downdraft is off to the right. That's your rain and hail core, where most of the practical damage from a supercell happens. In this case, it's almost transparent. This is a low-precipitation supercell, which means the forward flank isn't dumping much rain. You can practically see through it. LP supercells are a photographer's dream for exactly this reason.

Below the updraft, there's a subtle lowered area. That's the wall cloud. It doesn't look dramatic here, but it's rotating. I watched air rising into it, feeding the updraft above. Behind the wall cloud, on the west side, the rear flank downdraft is working its way around the mesocyclone toward the east side.

There's no obvious inflow tail on this storm, but look at the air near the top of the updraft. You can see it streaming in and wrapping around the base. That's inflow. The storm is pulling air into itself like it's breathing.

And here's the thing about this particular storm: it's about to produce a tornado. Right after this moment, a funnel began forming. Rising motion spiraling up into the base. The base itself is starting to look smoother, more laminar. That smoothness is a sign. When the bottom of a storm starts looking polished instead of ragged where there's a lot of motion, it usually means rotation is tightening. I've learned to pay very close attention when that transition happens.

This storm is textbook. You can see every feature, label every part. Which is great, because the next one is going to be less easy.

Storm #2: The Brawler (Classic Supercell)

I'm looking northwest at this storm and it is a completely different animal. If Storm #1 was elegant, this one showed up looking for a fight.

The updraft is there, but the whole scene around it is busier, messier, more aggressive. Off to the right, the forward flank downdraft is dark. Really dark. That rain and hail core is loaded and it looks menacing even from a distance. Classic supercell behavior.

Now here's where it gets interesting. There's a prominent wall cloud hanging below the updraft base, clearly lowered and clearly rotating. Behind it, the rear flank downdraft is surging. I can see a shelf cloud being pushed outward on the left side of the lowered area, where the cloud slants away from the precipitation. That shelf is the RFD making its presence known, physically shoving air outward as it wraps around.

In the middle of all this, rotation. Not dramatic, not photogenic, but visible. I can see dust getting kicked up near the surface as the rear flank downdraft curls around. And the wheat in the foreground? Blowing straight into the storm. That's inflow at the surface, feeding the updraft,

keeping the whole machine running.

This storm also produced a tornado after this moment. But I want you to notice something: when you see a dark, surging RFD wrapping behind a visible wall cloud like this, the tornado that follows is almost always rain-wrapped. Nine times out of ten. That gorgeous structure you're watching is about to disappear behind a curtain of rain, and whatever happens next, you're not going to see it. That's exactly what happened here.

Just because a storm is classic now doesn't mean it'll stay that way. **Supercells change their appearance, sometimes many times over their life-cycles.**

Two storms, two tornadoes, two completely different visual experiences. And we've still got one more.

Storm #3: The Chaos Monster (High-Precipitation Supercell)

This storm looks nothing like the first two. Absolutely nothing. If I showed you all three side by side, you might not believe they share the same anatomy. This is a high-precipitation supercell, and it is pandemonium.

The updraft is massive. It's right in front of me, enormous and imposing, the kind of storm that makes the sky feel like it's lowering onto you. The forward flank downdraft? It's back there somewhere, buried behind layers of rain and murk. Hard to see, hard to separate from the rest of the storm. HP supercells don't give you clean lines between features. Everything bleeds together.

The rear flank downdraft is the wildest part. There's a glowing area of precipitation that marks it, but there's also this dark mass moving from right to left. That's the RFD surging around the mesocyclone. And because this is an HP storm, the tornadic area is already being swallowed by rain.

The wall cloud? It was there. Then it wasn't. The rain just ate it. Above me, a rear flank downdraft shelf cloud is pushing outward, but it's not well-defined because honestly, nothing about this storm is well-defined. To the right, inflow is still feeding in, and this thing just went completely, hopelessly rain-wrapped.

If there's a tornado in there, and the storm absolutely has the structure to produce one, nobody is seeing it. This is the kind of storm where you have to trust your radar and your instincts, because your eyes aren't going to help you.

You Can Do This

Three supercells. Same parts list. Completely different presentations. That's the reality of reading storms in the field. The diagrams give you vocabulary. The real world gives you a thousand variations on the same theme and asks you to figure it out in real time while the wind is picking up and the sky is turning green.

I love it. Every single time.

The more storms you watch, the faster you'll start recognizing the updraft, the downdrafts, the inflow, the rotation. And once those pieces click, you stop seeing a wall of chaos and start seeing a machine with moving parts. It doesn't get less awe-inspiring when you understand it. If anything, it gets more so. Knowing what you're looking at makes the spectacle bigger, not smaller.

It's COMING on June 12-13! DFW Ham Expo for 2026 is Twice As Big - AGAIN! **We are still in the Vista Mall in Lewisville (TX)** but we are moving to the much larger NTX Arena (former JCPenney store) with closer parking and a shorter walk (see map below).

After selling out our 11,000 sq. ft. space for 2025, we are more than doubling in size again for 2026. We will have over 25,000 sq. ft. Our new space will allow featured placement for Commercial Dealers as well as over 200 vendor tables. Everything is again all in one space with a more spacious table layout, with direct access from the parking lot, and plenty of air conditioning!

Just like 2025, DFW Ham Expo is still Two Days (Friday 1pm-6pm and Saturday 9am-3pm, Tailgate Saturday only at 7am). Our attendance has been growing every year and we expect to welcome more than 1,000 hams this year!

Vendor Amenities for 2026:

- Commercial Dealer table placement available - these tables will have curtain or back wall (for signage) and large setback. Commercial Dealers must have a business presence (storefront or website).
- Vendor tables - Over 200 vendor tables are available. Premium table placement at end of row and endcap is available. Vendor tables will have more back-to-back spacing than 2025.
- Direct Parking Lot Access - no inside-mall unloading path this year.

Vendor Table purchase is now available on the DFW Ham Expo website (please read the Information for Vendors)

Plus the things you've come to expect every year from DFW Ham Expo: Large outdoor tailgate on Saturday starting at 7am - get your bargains early. Ham Radio VE testing by WB5QNG and the W5YI Crew (registration links on our website). Radio Testing by AE5IV - test that radio before you buy. Hunt The Fox! - we'll have a hidden transmitter somewhere in the Mall. Plus convenient access to ATM and the Mall's Food Court vendors.

Admission tickets will be available online soon (and at the door). Packages of Prize Tickets are also available so you can increase your chances of winning the great prizes. Buy your Admission and Prize Tickets in advance and they will be pre-printed and available at the separate will-call check-in - avoid having to stand in line and fill out your name multiple times!

PURCHASE YOUR TICKETS online at our DFW Ham Expo website: dfwhamexpo.com. As with previous years, we use the Zeffy non-profit platform for ticket sales (and you can always select "other" to reduce their suggested service charge). **NOTE:** Online ticket sales will end on Wednesday June 10.

We look forward to seeing you there! And be sure to tell your friends! Detailed directions and a map are available on the DFW Ham Expo website - dfwhamexpo.com

DIRECTIONS: From I-35E, take the Round Grove Road/Hebron Pkwy exit, and go west on Round Grove Road. Take a left at the first mall entrance and go to the lower NTX Arena parking lot.

DFW Ham Expo Inc.

THOUGHTS ON STORM BY-PRODUCTS FROM SKYWARN TRAINING

By Scott Whitfield KE5AYC

Severe Thunderstorm By-Products:
Straight-line Winds, Flash Flooding, Lightning, Hail, Tornadoes

Thunderstorm Basics
Typical Size – 15 miles in diameter
Duration – 30 minutes
Occurrences of thunderstorms number 100,000 per year in the US
10 percent of those are severe

Definition of Severe Thunderstorm
1 inch or larger hail, 58 mph winds or stronger, tornado

Necessary ingredients needed to produce a thunderstorm
Shear - Differing wind speed with height
Lift – cold or warm fronts, sea breezes, mountains, or the sun's heat are capable of lifting air to help form thunderstorms
Instability - Unstable air – warm air that rises rapidly
Moisture – to form clouds and rain

In North Texas fronts, gulf breezes, and the sun's heat are present in the development of thunderstorms. (Here's an important tip). On a day when the possibility of severe thunderstorms is in the forecast, the daytime heating will many times be a significant factor in the strength and severity of those storms. If we have periods of sun in the late morning and early afternoon, the convection created by this daytime heating will likely bring us a more active severe weather pattern in the late afternoon and evening when the storms develop.

Thunderstorm Life Cycle: Developing Stage

Here are some observations of the developing stage of a thunderstorm.

Cumulus Cloud Formations

Towering cumulus cloud indicates rising air. These are the puffy cauliflower type clouds.
Moisture flows into the storm and rises producing the cloud structure. Strong winds at the surface ahead of the storm many times are blowing towards the storm center. This is called inflow.

Lack of falling rain

Little if any rain is present in the developing stage. The moisture is being carried into the heart of the storm and is rising creating those cumulus clouds. At this stage of development the moisture is rapidly rising through unstable air.

Occasional lightning

Lightning is a significant energy source.
Energy within the storm is growing.
A 10 minute time duration is the average for the developing stage.

Mature Stage

Possible hail, heavy rain, lightning, strong winds, tornadoes may occur. One or all of these can develop. It is also important to watch other storms in the area and their development.

Storm Development and Organization

Other cells in the area may try to congregate in a formation or form together and combine forces to create a larger cell. We call this storm organization.

Storm Fronts and Squall Lines

If a strong fast moving front is involved the storms may form in a line and the line may move across the region. If this occurs we refer to this as a squall line or linear storm structure. Some storms in the line are stronger than others. When comparing what we see with radar, If strong storms are near an area that is bowing out from the line on radar or on the southern

tip of the line on radar, we watch these for rotation and possible tornadoes. In a linear storm structure, these two areas as described and viewed on radar, tend to be areas of higher interest in looking for rotation, lowerings to support ground truth. When viewing them on radar, hook echoes are what we look for.

Storm Coloration and Rotation

In the mature stage the storm is likely to have a black or dark green appearance. Storms that are low to the ground become black or show signs of rotation can develop quickly into dangerous situations. The spotter is looking for signs of rotation, a funnel, scud clouds practically on the ground, or signs of debris on the ground, seemingly not connected to a funnel. Any of these phenomenon are signs of a center of rotation within the storm that is at or nearing ground level.

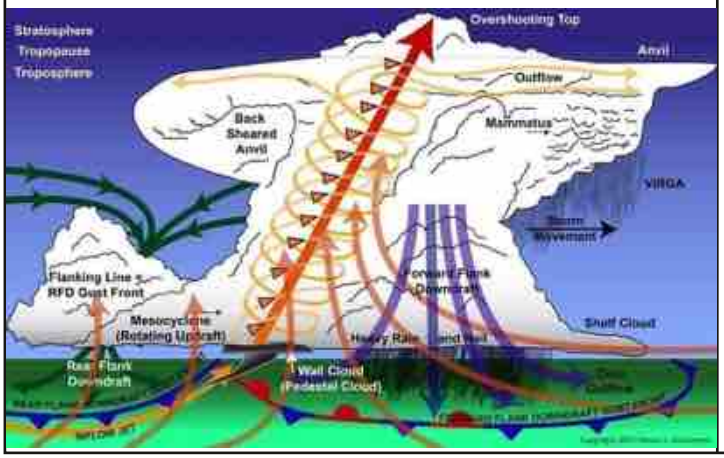
Storms that are greenish in appearance are likely to contain large hail. Storms that appear pink at times are displaying lightning that may not be seen as bolts or cloud to ground, commonly referred to ad CG.

Wall Clouds

Storms that develop a dark lowering that is straight across the bottom and fairly squared on the ends is commonly referred to as a wall cloud. Wall clouds are generally a precursor to a tornado. Tornadoes do not always follow the development of a wall cloud, but if the storm continues intensifying and rotation is present in the wall cloud, it will likely at least produce a funnel cloud.

10-20 minutes is the average time span for the Mature Stage of a thunderstorm. In some storms the mature stage will last longer, particularly if it is strong, slow moving and or combines with another severe cell.

Dissipating Stage



Rainfall intensity decreases in the dissipation stage. Downburst winds are possible as the storm collapses. Lightning remains a threat as the cells are still active and energy is looking for a new area to occupy or another cell to feed into.

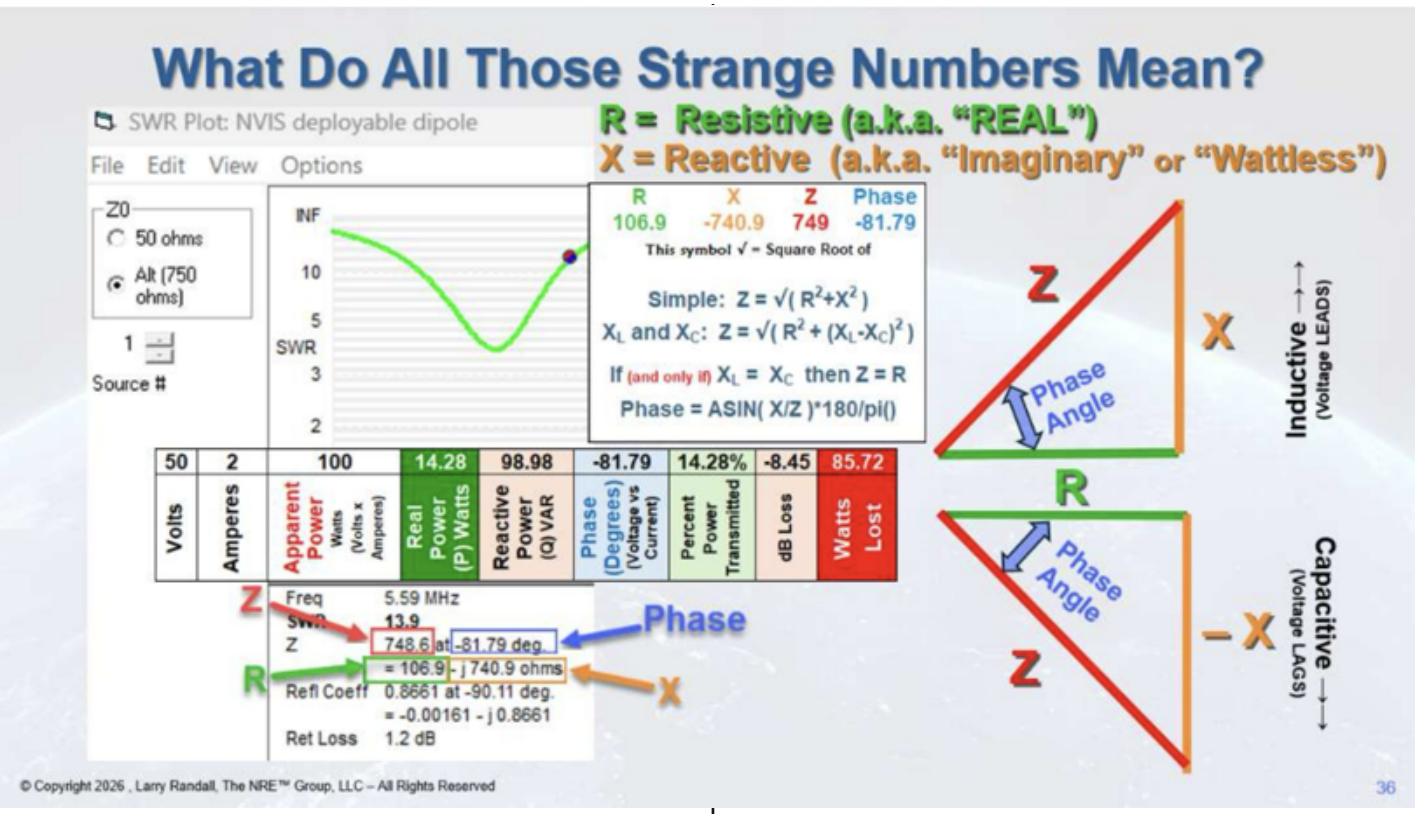
The Dissipation Stage can be rather short probably 10 minutes or so. It is helpful to study the Graphic of Horizontal view of classic supercell thunderstorm. This is what the storm will look like to the spotter on the ground.

It is also helpful to study the Vertical view of the classic supercell thunderstorm from above—but I don't have one.

These two views will give you an understanding of the positioning of the elements of the storm.

ANTENNA RADIATION EFFICIENCY

By Larry Randall



This article discusses the "why" and "how" of achieving maximum transfer of power to the antenna. The single most important thing for any antenna to radiate effectively is that voltage and current on the antenna be IN PHASE at the feedpoint.

- No, that does NOT mean that the antenna must be resonant.
- ANY metal object will radiate effectively if voltage and current are applied in phase.

What determines the amount of applied power that is radiated?

Power is divided across the series circuit of RR + RC + RG (Radiation Resistance + Coil Resistance + Ground Resistance). Radiation resistance is an effective resistance, because it is the value of the radiation from the antenna as radio waves. In other words, it is the REAL (i.e., non-reactive) value of the antenna element impedance -- that is, the value of resistance that would consume the same power radiated by the antenna.

Only RR is beneficial for radiation. Therefore, we want RR to be as large as possible, and RC and RG to be as small as possible. So, yes, a short antenna (e.g., a mobile) can be relatively efficient; BUT we cannot escape the pesky equation:

For a monopole, $RR = h^2 / 312$,

- RR is Radiation Resistance in Ohms
- h is antenna length in electrical degrees

8-foot Base Loaded Antenna at 7.2 MHz

Speed of radio wave in metal 284802835 Meters per second. Divide by 1,000,000 284.802835 284.803 / freq (MHZ) 39.55597222 Full wavelength at 7.2 MHZ (meters)

Multiply by 3.28 129.7435889 Full wavelength at 7.2 MHZ (feet)
Divide feet by 360 degrees 0.360398858 Feet per degree
Divide length (ft) by feet / degree 22.1976286 Height in electrical degrees
Square the height in Degrees 492.7347157
Divide by 312 1.579277935 Radiation Resistance in Ohms

Increasing Efficiency

We can increase the ability of a short antenna to radiate by placing a loading coil in the center, (raising RR) but we cannot change the fact that a short antenna (in electrical degrees) has lower Radiation Resistance than a long antenna.

We gain an advantage in RR with center loading, however, because the antenna appears electrically longer. In essence, the 8-foot-long center loaded antenna appears (i.e., in Radiation Resistance value) to be around 11 feet long.

WHY?

The power available to be radiated depends upon the power applied, the phase relationship of that power at the feed point AND upon the ratio of Radiation Resistance to Loss resistances.

In other words,

Radiated Power = In Phase Power in
x(RR/(RR+RC+Rg))

Matched means that voltage and current are *relatively* in phase – in other words, not necessarily exactly in phase, but very close.

- When voltage and current are out of phase, we get a low POWER FACTOR.
- Low Power Factor means that we have WATTLESS POWER, which CANNOT be radiated.

Degree-Ampere Area is Important

Many people assume that one mobile antenna is pretty much the same as another, or that the longer, the better. It is far more important that we consider how much in-phase voltage and current can be pushed into the antenna in the most effective manner. This boils down to basic trigonometry and geometry.

Degree-Ampere Area -- Base Loading

Because a simple whip (or half element of a dipole) has maximum current at the feedpoint that tapers to zero at the end, we have triangular current distribution. The degree-Ampere area is defined by the equation for the area of a triangle:

Area=1/2 * Base * Height

In the antenna case ,

*DegreeAmpArea=1/2 * Length * Width*

(Length in *electrical degrees*).

Degree-Ampere Area -- Center Loading

When we add a loading coil near the center of the antenna, we INCREASE the degree-Ampere area of the antenna.

Rectangular below the coil

*DegreeAmpArea = Amperes * Length*.

Triangular above the coil

*DegreeAmpAres = 1/2 * Amperes * Length*.

Thus, with center loading, about 2/3 of the radiation from the antenna occurs below the coil PROVIDED that the lower portion of the antenna is not shielded by metal.

Real-world Example

Of the three mobiles in the same convoy, only I was able to communicate on the same frequency, from the same location, at the same time, to the same stations. One had a 100-Watt radio with a "remotely tuned" screwdriver mobile antenna. The other had a 100-Watt radio with "built-in tuner" feeding a "linear loaded" mobile antenna.

I had a 100-Watt radio feeding a Hustler mobile antenna fed by an Icom AH4 Automatic Antena Matching Unit (a.k.a., "Tuner").

Band 7 MHZ. Location on I-10 from San Antonio to Bogalusa, LA. (Doing relief after Katrina).

- Same 100-Watt power output.
- Different antennas.
- Different feed configurations.

The "Why"

The screwdriver antennas consist of an adjustable coil at the bottom of the antenna and a whip that may be 4 feet to 12 feet in length (standard supplied is 6 feet). "Tuning" is done by monitoring SWR at the radio while raising (exposing more) or lowering the coil with the supplied control. In other words, adjustment allows the transmitter to output into a reactive "load" that "kinda, sorta" looks like 50

Ohms.

Note that the coil is mounted to and connected to the ground point so essentially you have a simple base loaded whip with a coil that is adjusted for lowest SWR – without regard to the phase of voltage and current applied to the whip (i.e., the radiating element).

The other antenna had similar issues, with an "in radio tuner" that simply worries about the value of SWR in order to protect the radio, and does nothing to measure, sense, or correct the voltage and current phase relationship at the antenna.

A mobile antenna typically has an SWR bandwidth of less than 20 kHz or less. Outside of that narrow slice, it is highly reactive. An actual automatic antenna matching unit sits at the feedpoint and supplies a conjugate match to the antenna – thus aligning voltage and current at the REAL (i.e., non-reactive) value of impedance presented by the radiating element.

Don't Forget Losses

Never ignore the fact that

Radiated Power = In Phase Power in x(RR/(RR+RC+Rg))

Radiation Resistance is Our Friend

We want RR to be as high as possible, so we use antenna designs that maximize RR and minimize losses.

Ground Loss (RG)

To minimize RG in a mobile, we move the antenna AWAY from ground, to as high on the vehicle as practical. If we are lucky, we can get RG below 6 Ohms. Since RR may be well under 3 Ohms on low HF, low RG is important, as is center loading to raise RR.

Coil Loss

All coils have losses, but good coil design can minimize those losses. There is a point of vanishing returns; however, as coil size creates wind loading and adds requirements for mechanical design – especially in a mobile environment. Because the losses are greatest at low HF frequencies, and decreases (because coil size decreases) as frequency increases, the standard Hustler coils are a reasonable compromise.

Summary

The efficiency of a short antenna is highly dependent upon:

a) Length of the Radiating Element in Electrical Degrees

b) Method of loading

c) Phase relationship between voltage and current

d) The ratio of Radiation Resistance to the sum of Radiation Resistance plus Coil (or material) Loss plus Ground Loss.

Power transmitted = ***In Phase*** voltage and current multiplied by (RR / (RR+RC+RG)).

Any short antenna design is a compromise; however, we can maximize the amount of power available to be transmitted through careful design and installation choices. (Sometimes called good engineering practices)

Bio

As an engineer and consultant, Larry Randall has aided militaries, governments, and companies in the fields of worldwide and tactical radio communication, diplomatic level communications security, emergency management, process design and improvement, and import/export operations. He has held every class of FCC Amateur Radio license and all levels of FCC Radiotelephone licenses through First Class. He currently holds Amateur Extra Class and GROL.

He has designed and delivered systems and training in multiple countries in the Middle East, South America, Central America, Europe, and Asia, as well as in the United States. Training subject matter created includes radio propagation, electronic theory, electronic troubleshooting, system operations, physical and communications security, and software development topics.

He and his wife make their home in Richardson, Texas.

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CLUB CALENDAR

APRIL

Sunday 29	Monday 30	Tuesday 31
1p Military Veterans D-Star Net @ REF026A **7p** Intl D-Star Net @ REF001C **8p** K5TIT D-Star Net @ REF33B	**7:30p** Texas ARES Net @ 3.873 MHz **8:30p** MARC Simplex net	**7p** HAM (Mesquite) InfoNet @ WJ5J (145.310 PL 110.9) **7:30p** Ark-La-Tex D-Star Net @ REF048B **8p** Texas D-Star Net @ REF004B **8p** Lucas Open Net
5 **1p** Military Veterans D-Star Net @ REF026A **7p** DARC (Dallas) Meeting on the Air **7p** Intl D-Star Net @ REF001C **8p** K5TIT D-Star Net @ REF33B **9p** Collin County ARES @ WD5ERD	**6** **7p** GARC (Garland) Club Meeting **7p K5PRK Board Club Meeting** **7:30p** Texas ARES Net @ 3.873 MHz **7:30p** RWK -- Meeting on the Air @ 147.12, PL110.9 **8:30p** MARC Simplex net	**7** **7p** DARC (Dallas) General Meeting **7p** HAM (Mesquite) InfoNet @ WJ5J (145.310 PL 110.9) **7:30p** Ark-La-Tex D-Star Net @ REF048B **8p** Texas D-Star Net @ REF004B **8p** Lucas Open Net
12 **1p** Military Veterans D-Star Net @ REF026A **2p** Texas RACES Net (HF) @ 7.255MHz **7p** Intl D-Star Net @ REF001C **8p** K5TIT D-Star Net @ REF33B	**13** **7:30p** Texas ARES Net @ 3.873 MHz **8:30p** MARC Simplex net	**14** **7p** HAM (Mesquite) InfoNet @ WJ5J (145.310 PL 110.9) **7:30p** Ark-La-Tex D-Star Net @ REF048B **8p** Texas D-Star Net @ REF004B **8p** Lucas Open Net
19 **1p** Military Veterans D-Star Net @ REF026A **7p** DARC(Dallas) Meeting On The Air **7p** Intl D-Star Net @ REF001C **8p** K5TIT D-Star Net @ REF33B **9p** Collin County ARES Training Net @ W5MRC **Rookie RU SSB Contest**	**20** **6p VE Testing @ K5PRK** **7p K5PRK Monthly Club Meeting** **8p** American Legion Post 315 Radio Club Net @ W5SRA **8:30p** MARC Simplex net	**21** **7p** HAM (Mesquite) InfoNet @ WJ5J (145.310 PL 110.9) **7:30p** Ark-La-Tex D-Star Net @ REF048B **8p** Texas D-Star Net @ REF004B **8p** Lucas Open Net
26 **1p** Military Veterans D-Star Net @ REF026A **2p** Texas RACES Net (HF) @ 7.255 MHz **7p** Intl D-Star Net @ REF001C **8p** K5TIT D-Star Net @ REF33B	**27** **7p** DARC (Dallas) Geek Net **7p** GARC (Garland) Club Meeting **7:30p** Texas ARES Net @ 3.873 MHz **8:30p** MARC Simplex net	**28** **7p** HAM (Mesquite) InfoNet @ WJ5J (145.310 PL 110.9) **7:30p** Ark-La-Tex D-Star Net @ REF048B **8p** Texas D-Star Net @ REF004B **8p** Lucas Open Net

APRIL

Wednesday 1	Thursday 2	Friday 3	Saturday 4
6:50p NTx Readiness QST Net @ 7.27750 MHz LSB **8p** N5SAC Weekly Info Net @ N5SAC **8p PARK Informal Net @ 147.180+ MHz, (107.2)**	**11a** GARC (Garland) Crony Lunch @ Judy's Cafe **7p** HAM (Mesquite) Monthly Meeting **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net	***8:30,9a*** North Texas Hospital Radio Club weekly check in	**12p** Garland "Hands-On" Gathering **7p** DARC (Dallas) Tech Net **9p** Saturday Night D-STAR Net@REF029A
6:50p NTx Readiness QST Net @ 7.27750 MHz LSB **8** **8p** N5SAC Weekly Info Net @ N5SAC **8p PARK Informal Net @ 147.180+ MHz, (107.2)**	**11a** GARC (Garland) Crony Lunch @ Judy's Cafe **9** **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net	***8:30,9a*** North Texas Hospital Radio Club weekly check in **10**	**9a** W5YI VE Test Session @ Wylie **11** **7p** DARC (Dallas) Tech Net **9p** Saturday Night D-STAR Net@REF029
6:50p NTx Readiness QST Net @ 7.27750 MHz LSB **15** **8p** N5SAC Weekly Info Net @ N5SAC **8p PARK Informal Net @ 147.180+ MHz, (107.2)** **7p** Murphy CERT Net @ W5SRA **8:30p** NTx ARES Net	**11a** GARC (Garland) Crony Lunch @ Judy's Cafe **16** **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net	***8:30,9a*** North Texas Hospital Radio Club weekly check in **17**	**9a** W5SRA Laurel VE Test Session **18** **9a** GARC (Garland) ECC Open House **7p** DARC (Dallas) Tech Net **9p** Saturday Night D-STAR Net@REF029A
6:50p NTx Readiness QST Net @ 7.27750 MHz LSB **22** **8p** N5SAC Weekly Info Net @ N5SAC **8p PARK Informal Net @ 147.180+ MHz, (107.2)**	**11a** GARC (Garland) Crony Lunch @ Judy's Cafe **23** **7p N5SAC Club Meeting@Spring Creek** **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net	***8:30,9a*** North Texas Hospital Radio Club weekly check in **24**	**7p** DARC (Dallas) Tech Net **25** **9p** Saturday Night D-STAR Net @ REF029A
6:50p NTx Readiness QST Net @ 7.27750 MHz LSB **29** **8p** N5SAC Weekly Info Net @ N5SAC **8p PARK Informal Net @ 147.180+ MHz, (107.2)**	**11a** GARC (Garland) Crony Lunch @ Judy's Cafe **30** **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net	***8:30,9a*** North Texas Hospital Radio Club weekly check in *1*	**7p** Murphy CERT Net @ W5SRA *2* **7p** DARC (Dallas) Tech Net **9p** Saturday Night D-STAR Net@REF029A

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