March Issue

PLANO AMATEUR RADIO KLUB PT

JANUARY WWW.K5PRK.NET 2026

- **Ed Fong is our speaker for March!**

PARK HERE

Officers (your answers begin here)		
President	Mike Tharp KG5TJF	president@k5prk.net
Vice President	Bruce Cameron K6IL	vp@k5prk.net
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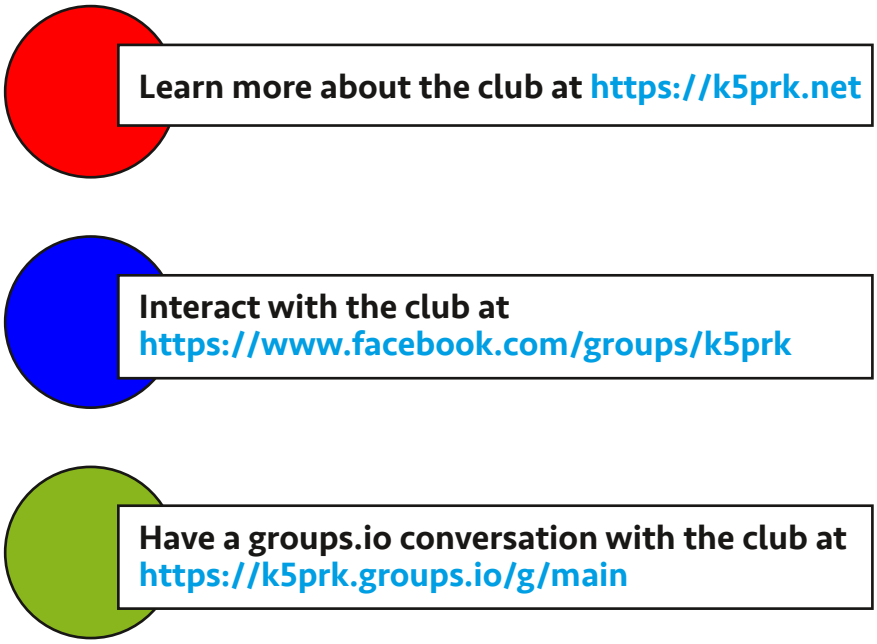
Newsletter	Lonnie Webb KG5WHQ	newsletter@k5prk.net

EXPERIMENT AND HAVE FUN WITH YOUR RADIO



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

Program Development: If you are interested in helping the club develop a new community engagement program – Please reach out to **Asif Ahmed K5SIF**. Asif is heading up a committee to develop a program for community engagement.

We are asking for 2 or 3 people to assist Asif with this program. The intention is to create a long-term program for PARK to engage and promote the club and the art and hobby of HAM radio.

I got engaged in amateur radio to ensure that in an emergency my wife and I could stay in communication if cellular services were not available.

Obviously, amateur radio has become more than that to me. PARK is the reason. I'd like more people to experience what our club and people offer.

So, if you're able to join Asif, please reach out online or at the next meeting.

ACTIVITIES

Outreach and Education Steering Committee

By Asif Ahmed K5SIF
activies@k5prk.net

I'm looking for for 3-5 volunteers. Anyone can perform this job but only YOU can thrive in it!

Join us to brainstorm education projects, community outreach, and use our hobby to give STEM education. Ideally we can partner with local groups.

The committee will address community resilience we will continue our relationship with Dallas Marathon, SkyWarn, etc.

We seek hands-on mentoring with Antenna builds by B.J. Watkins. Maybe Tim can help with satellite communications. Perhaps Dave can help us with CW. This summer Lonnie will have amateur radio exam prep classes.

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

Speakers for 2026

By Vice President Bruce Cameron

UPCOMING SPEAKERS

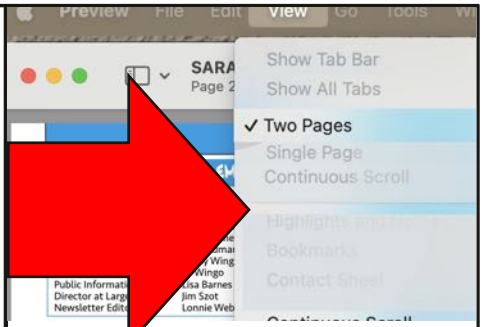
K6IL
VP@k5prk.net

March: Ed Fong—Antenna Designer
April: Tony Brock Fisher—FlexRadio
May: Bruce Cameron—Air Force Mars
June: Mike Tharp—Filed Day
July: PARK Auction

More presenters are needed! If you would like to present or have a suggestion, please email me at VP@k5prk.net

Triband Antenna Talk

Our guest speaker for the March meeting will be **Ed Fong WB6IQN.** As many of you know, he is the inventor of the DBJ-1 and DBJ-2 antenna that was featured in the February 2003 and March 2007 QST. There are over 40,000 of these antennas in use today. In this month's meeting he will talk about TBJ-1 – a triband base antenna that was published in March 2017 QST. This antenna covers 2mt/220 MHz/70cm in one 66 inch pvc pipe and requires no radials and no lightning arrestor.



Ed will give a history on how these antennas were developed and the theory on how and why they work so well. There is no "black magic" to antennas. He will explain in a non-mathematical manner to convince you for overall performance and simplicity - his approach is one of the most practical.

Biography

Ed Fong was first licensed in 1968 as WN6IQN. He later upgraded to Extra Class (when 20 WPM was required) with his present call of WB6IQN. He obtained the BSEE and MSEE degrees from the Univ. of California at Berkeley and his Ph.D. from the Univ. of San Francisco. A Life Senior Member of the IEEE, he has 13 patents and over 50 published papers and books in the area of communications and integrated circuit design. Presently, he is employed by the University of California, Santa Cruz as an instructor teaching graduate classes in Antenna Design, RF design and high speed interface.

MARCH SPEAKER

VIRTUAL SKYWARN TRAINING
Saturday, March 21

Next Meeting: March 16, 2026

On the cover: *Antenna designer* **Ed Fong WB6IQN.**

COLORADO CALL FOR HELP

DOUBT YOUR H.T. HABBIT CAN SAVE YOUR LIFE?

Calling Doug Morse, N2MZU, an avid outdoorsman is an understatement. A rock climbing instructor, back-country guide, and do-it-all outdoor adventurer, the man knows his way around the mountains.

While skiing with his wife out in the Pennsylvania Creek Drainage near Breckenridge, Colorado, in February 2019, Doug's wife fell and fractured her fibula near the ankle.

Right away, Doug found that he had zero bars on his cell phone, meaning he was out of cell tower reach. He could have hiked up higher for a couple of hours, until he got a signal, but he didn't want to leave his wife alone for that long. And not having his satellite communicator with him at the time, he turned to his remaining solution, a handheld ham radio. Even though the two were somewhat hidden in a deep ravine, Doug managed to reach a nearby repeater that was part of the CERN (Colorado Emergency Reporting Net) system.

Mike Ranalls, KYØJAM, heard Doug's call for help, and relayed their location coordinates and condition to Summit County Search and Rescue. Eventually, the SAR team launched a snowmobile rescue, and within hours, the Morse couple was brought back to safety.

Doug Morse has regularly carried his ham radio with him into the woods, since getting licensed in the mid-90s, and says that the benefits of real-time emergency communication is invaluable. Doug often heads into the back country with his cell phone, a satellite communicator, and his handheld ham radio. That way, I can assume that I should be able to get help with one of those items, if something goes wrong. This time, it was the oldest of the three technologies that did the trick.

Source: *Elevation Outdoors, Ryan Wichelns, Oct 2019, p. 10-11*

THE INTERNET FOR HAMS: 44NET

The 44Net (also known as AMPRNet or Network 44) is a massive block of public IPv4 addresses (roughly 12.5 million IPs in 44.0.0.0/9 and 44.128.0.0/10) reserved exclusively for licensed amateur radio operators. It's been around since the 1980s and is administered by ARDC (Amateur Radio Digital Communications). Think of it as a global, ham-only internet where every device gets a real, static, globally routable public IP — no NAT, no CGNAT, no port forwarding hassles.

ardc.net

What can you actually do with it?

Pretty much anything you'd do on a normal internet connection, but tied to amateur radio experimentation and rules. Here are the most common real-world uses:

• **Run servers and services that are directly reachable from anywhere.** Host a web server, email server, file server, Minecraft server, monitoring dashboard, or personal cloud storage — all with a permanent 44.x.x.x address that works even if you're behind residential NAT at home.

• **Remote access & control of ham radio gear**. Access your shack computer, repeater, remote station, or SDR from anywhere. Tons of people use it for remote radio control, AllStarLink nodes, D-Star, Echolink, or IRLP linking.

• Build or join ham radio networks Link repeaters and digital voice systems across towns or countries

• Create club networks, makerspaces, or educational labs

• Run regional RF backbone links (VHF/UHF/microwave/optical)

• Participate in mesh networks (like the big European HamNET)

• **Experiment with advanced networking**. Play with BGP routing, autonomous system numbers (ASNs), custom routing, tunnel overlays, or hybrid RF + internet setups. Some people even announce their own prefixes.

• **Emergency comms & public service**. Many groups use 44Net for coordination networks, remote site management, and resilient backup links.

• **Learning & personal projects**. Perfect home lab for learning networking, systems admin, or just having a permanent public IP for whatever ham-related nerdery you're into.

The easy modern way: 44Net Connect (launched 2025)

If the old-school tunnel stuff sounds intimidating, this is the game-changer. You just:

1. Sign up at the portal with your callsign
2. Get a WireGuard config
3. Connect from your laptop, Raspberry Pi, router, phone hotspot, cloud VM, etc.

Instant public 44Net IP, even behind CGNAT or on mobile data. Great for beginners, portable setups, or just testing things out.

Requirements

• A valid amateur radio license (callsign must be verified).

• All use must be ham-radio related and non-commercial

• You agree to ARDC's policies (basically: secure your stuff, don't spam, etc.)

How to get started

1. Go to the 44Net Portal → create an account & verify your callsign.
2. Decide your style:
   • Easiest: 44Net Connect (WireGuard)
   • Community mesh: IPIP tunnels
   • Pro: BGP announcement
3. Request your IP block(s) through the portal.
4. Check the official wiki—it's excellent and has step-by-step guides.

In short

it's like having your own slice of the original internet, but only for hams—free public IPs + global connectivity for radio experimentation. If you have a callsign and like networking/radio, it's an absolute goldmine. Jump in and start building!

More info: *https://portal.ampr.org/, https://wiki.ampr.org/*

Bamboo to Metal Push-Up Antenna Upgrade

By Tim Johnson K5TCJ
k5tcj@hotmail.com

I recently upgraded my antenna installation from a bamboo pole tied to the gutter, to a more substantial push-up pole.

The Discone was moved from a vent stack and the 6-meter Squalo was on the Bamboo pole. The dual-band vertical is for a YSF radio, and the BJ Watkins dipole is on a DMR radio.

The push-up pole is not completely extended so that it is a bit more rigid as I didn't want to install guywires. So far it has survived our north Texas winds.

Figure 1. Completed pole installation and the main VHF/UHF vertical mounted to a vent stack.

Figure 2. Completed pole installation.

Figure 3. Upper half - Antennas – Scanner Discone, 6-meter Squalo, BJ Watkins 2m/70cm dipole project.

Figure 4. Note the double bracing for rigidity of the bracket.

Not that I care, nor is it required, but only the very top of this is visible from the street.

Expanding Interoperability: TIRIS Phase 3

The Texas Interoperable Radio Interconnect System (TIRIS) continues to grow, connecting public safety radio networks across the state to improve coordination and response. The Office of the Statewide Interoperability Coordinator (SWIC) is seeking volunteer agencies with conventional radio systems to join this vital initiative.

With support from the Statewide Emergency Radio Infrastructure (SERI) grant, up to seven (7) additional conventional radio systems will be integrated into TIRIS. The grant provides funding for the first two years of connectivity, backhaul, equipment, and subscription costs, reducing the initial burden on participating agencies.

After this two-year period, DPS will continue to support talk path licensing as funding allows. Participating agencies must contribute up to four (4) donor radios.

Agencies that join will ultimately be responsible for:

- Maintaining installed equipment
- Covering Critical Connect subscription licenses/ fees
- Providing backhaul connectivity
- Managing equipment hardware and software upgrades

This is an important opportunity to strengthen statewide interoperability while enhancing your agency's communications capabilities. For details, please send an email to the SWIC box at txswic@dps.texas.gov .

2026 Irving Hamfest

Mark your calendars — the Irving Amateur Radio Club is hosting the Friendliest Hamfest in North Texas!

- Saturday, March 7, 2026
- 8:00 AM – 2:00 PM
- Betcha Bingo — 2420 W Irving Blvd, Irving, TX

Come enjoy:

- 70+ vendor & flea market tables
- Full-service snack bar
- Hourly door prizes (must be present to win most!)
- Testing table — "Test before you buy"
- 1:00 PM GRAND PRIZE — Icom IC-7300MK2 HF/ 50/70 MHz transceiver!

- Admission: $5 (Adults) | Children 12 & under FREE
- Baker's Dozen Deal: 1 admission + 12 raffle tickets = 13 chances for prizes for just $20!

- Vendors can begin setup as early as 2:00 AM, with general doors opening at 8:00 AM.

Whether you're swapping gear, hunting bargains, meeting fellow hams, or just curious about amateur radio — this is the place to be! See you there!

https://irvingarc.org/hamfest-2026.

VIRTUAL SKYWARN TRAINING

Saturday, March 21

@9:00 AM

NWS Virtual Class:

https://attendee.gotowebinar.com/register/3744745741850523742

PARK BOARD OF DIRECTORS MEETING MINUTES

Plano Amateur Radio Klub
Board of Directors Meeting
March 2, 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
Asif Ahmed K5SIF, Activities Director
Tim Johnson K5TCJ, Immediate Past President
Miranda Schwark KE5YZP, Communications Director
James McCormick KG5KBP, Webmaster
Lonnie Webb KG5WHQ, Newsletter Editor
Kip Moravec AE5IB, Past President

Absent:
n/a

President
Brought meeting to order at 7:10 PM

Vice President
Updated program schedule:
March - Dr. Ed Fong – Antenna Engineering
April – Tony Brock Fisher - Flex Radio
May – Air Force MARS or David Donaldson HF J-poles(!)
June – Field Day
July – Club auction
August – Air Force MARS or David Donaldson

Secretary
January club meeting minutes posted to the board.

Treasurer
Treasurer report presented.
Problem with PayPal. It isn't accepting payments from the club website or Ham Club Online. We aren't getting drafts from PayPal to Digital Ocean so James has been covering it. BJ and James will hash this out and make sure James is reimbursed.
The ARRL application for the trustee change has been accepted but it's not complete.
All Star and Ham Club Online donations are complete.

Public Relations
Rob has identified ~20 private schools and home school organizations around Plano. There are 76 Scout troops within driving distance of the club so we can reach out to them for Field Day.

Communications
The Winlink gate radio is now a 110W mobile rig. The Prestige backup/spare for the ICOM VHF repeater (FR5000) currently belongs to Miranda. Exploring cost to buy the spare repeater and transfer ownership to the club.
The transmit combiner at the hospital is the only part that doesn't belong to the club but Miranda is going to cover it so there won't be a cost to the club to bring MCP online at present. There will eventually be cost for Ethernet.
The Fusion repeater needs an HRI 200 add-on to enable Wires-X. Need to verify if we have this or not.
The laptop at the tower is crashing. A good replacement would be an industrial PC that can be passively cooled configured for remote access. We should be able to eBay something for well under $300. Setup should be easy enough. ETA within the month.
Bruce motion, Lonnie second for $300 budget to replace the laptop at the tower.

Activities
Monthly area activities are being posted to the newsletter. Nobody has reached out for the special interest committees yet.
Interest in a local POTA session.
There are technician classes in May and June in Sachse.

Website
Email forwarding isn't working. We need to double check the forwarding addresses for the board.
Website access for the board is being addressed.

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

Old Business
Mike gained access to the ARRL Insurance website club account and is verifying the club inventory is current so we can make sure the right hardware is covered.
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.
REACT: The area hospitals have a REACT requirement for integrating amateur radio into their emergency plans and drills. How can the club leverage this?

New Business
Groups.io acceptable use needs to be addressed after someone posted a scam to the group. BJ presented a template for posting rules along with some examples. The board needs to address the posting rules and consider a guideline for using groups.io and the repeater. Poor radio etiquette is not acceptable and puts the repeater trustee at risk.
Once we have a completed document, it will be published on the website above the frequencies, and posted to groups.io. The trustee has discretion over the repeater acceptable use guideline.
The acceptable use document for groups.io discussion will be taken to the groups.io list for comment and updates for at least one month prior to further action.
Extra Space storage raised our monthly price this month to over $100. This is not sustainable. If Extra Space won't give us relief, we can look at a non-climate-controlled space, or look at a contract for a better rate. Mike Tharp will call them for more information.
PayPal problems – Ham Club Online uses square and PayPal, but PayPal is rejecting transactions. Square also charges a lower transaction fee. James moved to transition the club to Square. BJ second. Passed by unanimous vote. James will remove PayPal from the k5prk.net website.

Adjourn
Lonnie Motion, Rob second. Adjourned at 8:19 PM

PARK BOARD OF JANUARY MEETING MINUTES

February 16, 2026 General Meeting Minutes

Call to Order at 7:02 p.m.

President Mike Tharp KG5TJF
Opened the meeting with the Pledge of Allegiance and roll call. 22 present, 20 members 2 guests.

Vice President Bruce Cameron K6IL
February: Plano hospital update from Miranda, Communications Director
March: Ed Fong Antenna Designer
April: Tony Brock Fisher – FlexRadio
May – Bruce Cameron – Air Force Mars
June – Mikr Tharp – Filed Day
July – PARK Auction
If you would like to present, please email me at VP@k5prk.net

Secretary Damon Koch K5OCH
February board minutes are posted.

Treasurer B. J. Watkins K5BJW
Finance report presented

Communications Director Miranda Schwarck KE5YZP
The bad packet radio has been replaced with a Kenwood TK-790H (up to 110w) running along with the existing DRA-45. Both packet and VARA are tuned and running.

Newsletter Editor Lonnie Webb KG5WHQ
February newsletter is out! Please submit your ideas, pictures, and articles to the newsletter.

Public Relations Director Rob Forson K5WFR
Field Day 2026 – Working to obtain lists of local home schools and Scout troops to send invitations to our Field Day.

Webmaster James McCormick KG5KBP
Absent – no report.

Activities Director Asif Ahmed K5SIF
Outreach and Education Steering Committee – Open call for 3-5 volunteers
Brainstorm education projects and community outreach
STEM education – partner with local groups
Community Resilience – relationship with Dalls Marathon, SkyWarn, etc
Hands-on mentoring
Antenna builds (BJ)
Satellite (Tim)
CW (Dave)
Amateur Radio Exam Prep Classes (Lonnie)
Asif K5SIF will be the facilitator KG5CUX@gmail.com or Groups.io post
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.

Old Business
None

New Business:
Copying and Streaming General Meeting Presentations
Ham Club Online poll results showed there is limited interested in streaming and recording the General meetings.
The board recommends that those people who are interested in making recordings of the meetings work together to make and post recordings.
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.
REACT: The area hospitals have a REACT requirement for integrating amateur radio into their emergency plans and drills. How can the club leverage this?

Break

50/50 raffle Winner: Becky Siexas, N2JMT

Announcement: **KJ5ILH** announced LARC has a tech class coming up Feb 28 – March 1 at Frisco fire station 1. Interested? Reach out to LARC through their website or contact **Tom Yenny K5LOL.**

Program – Medical Center Plano Update by **Miranda Schwarck KE5YZP**

Adjourn at 8:50 PM

Club QSO Party in the Year of the Club

The genesis of a national club QSO party dates back to nearly a year ago during a South Jersey Radio Association Board meeting. The Board was brain storming how best to celebrate the club's 110th anniversary coming up in June of 2026. Ten years earlier then President Ken Botterbrodt, K2WB spearheaded the club's QSO party to celebrate its 100th anniversary. This anniversary was no small accomplishment for any club, but an especially proud moment for SJRA that has continuously met for over one hundred years*, suggesting that it is the oldest continuously meeting amateur radio club in North America.

The idea of another QSO party to celebrate our 110th anniversary gained some traction as the board followed Ken's explanation of a plan to repeat what had been done ten years earlier, but with some new twists. Some of us asked 'What if we could engage more clubs in sponsoring a QSO Party'? And, in the spirit of the ARRL's Year of the Club theme for 2026, why not market our idea to ARRL clubs across the entire US?

A series of online meetings with the presidents of the Phil-Mont Mobil Radio Club in Pennsylvania and the Kent Amateur Radio Society in Maryland generated more enthusiasm for the idea. The objective, we decided, would be simple – work as many Amateur Radio Club members and registered Amateur Radio Club Stations as possible in a 48 hour period from 00:00 UTC June 20th, 2026 to June 21st 23:59 UTC. This coincides closely with the founding of SJRA on June 16th 110 years ago and would be a good warm up for Field Day just a week away.

Contest operations will be valid on all amateur radio bands with the exception of 60m, 30m, 17, and 12m, and all modes will qualify including repeater contacts, satellite and EME QSOs. The objective is to make as many clubs Radio Active across the US as possible!

Members of clubs would sign their call/age of their affiliated club, and the exchange should also include their club's acronym. For example, as a member of the South Jersey Radio Association my exchange would be W2JAZ/100 + SJRA. Club stations are encouraged to contact other club stations (increasing their multiplier) as well their own club members and members of other clubs. It is not necessary for club stations to be in a permanent location. Member of the club can use the club call from any station as long as they have permission from the trustee. For example co-sponsor Kent Amateur Radio Society's club station K3ARS/40 might contact the SJRA club station K2AA/110. Non-club members who participate will use their call + their name. Stations outside the US should give their affiliated club acronym if they are a club member.

The exchange is designed to encourage club activity, reinforce club history and build nationwide relationships between amateur radio clubs. Clubs should register in advance, though this is not required. They must also activate their club station for a minimum of 2 hours during the 48 hour period.

Logging and Log Submission

Logs are required to be kept but it is only necessary to submit summaries. The summary submission form is available as a PDF download from the Club QSO Party website. Logs should include the following:

- Date of QSO
- UTC time of QSO
- Call sign/## of station contacted
- Club acronym exchanged if given
- Operator's name
- Frequency/Band of operation
- Mode

While no logging program currently offers a template for this event work is under way to create a Club QSO Party template for N1MM Logger+. It may also be possible to use other popular logging applications.

Why Participate in a Club QSO Party?

Participating in a club QSO party offers a blend of camaraderie, skill development, and networking, making it a valuable activity for new and experienced amateur radio operators alike.

Community & Social Aspects: QSO parties,

which are organized by local radio clubs, provide an excellent opportunity to connect with fellow club members and the broader ham radio community, both over the air and at in-person operating events.

Club Engagement: Participation contributes to your club's overall score in the club competition category, fostering a sense of teamwork and collective achievement.

Mentorship: Clubs often use these events as a way to welcome and mentor newcomers, providing a supportive environment for new operators to gain experience with HF operations, logging software, and contesting strategies.

Operating Practice: QSO parties are a great, low-stress way to practice operating techniques, get comfortable with radio equipment, and test new antennas or station setups in a friendly environment.

Contesting Skills: Shorter duration events have a more relaxed pace compared to major international contests making them an ideal entry point for learning the tactics and strategies of competitive operating.

Technical Knowledge: Setting up portable stations, dealing with varying propagation conditions, and optimizing your station for performance all helps hone technical skills.

Getting the Word Out

The most challenging aspect of this Club QSO party is getting the word out to other clubs across the US. Fortunately the ARRL is a source for a data base of affiliated clubs who will receive notification about this ambitious program. Hopefully, our enthusiasm will be contagious and they will help to promote the event in their own regions and locales.

A website has been created to provide detailed information about logging, how to register a club, scoring and prizes for the highest scores in various entry categories. The website is found at www.clubqsoparty.org. Rules and regulations along with club registration forms can be easily downloaded from the site. After reading through the rules and Frequently Asked Questions section on the website, additional questions about the Club QSO Party should be sent to clubQSO@SJRA.org. Get Radio Active and join us June 20-21, 2026 in celebrating your club's history and get acquainted with the many ARRL clubs across the country! --Richard Lawn, W2JAZ.

K5PRK immediate past president Tim Johnson suggests this activities for new Generals or anybody that has dust collecting on a rig.
**SJRA erroneously claims itself to be the oldest ham radio club in the USA as being founded in 1916. But, lo, W5AC—The Texas A&M Amateur Radio Club, appears to have that distinction being founded in 1912. That is to say, unless W5AC somehow stopped meeting during the war.*

Tornadogenesis

By Scott Whitfield KE5AYC

What does the word *Tornadogenesis* mean?

Tornadogenesis is the process by which a tornado forms. There are many types of tornadoes and these vary in methods of formation.

In step 1 of tornadogenesis, the storm acquires large-scale rotation—a midlevel mesocyclone—by tilting the horizontal vorticity in winds entering the storm's updraft. In step 2, buoyancy gradients, due to relatively warm and cool air straddling either side of downdraft air parcels, generate horizontal vorticity.

What is the physics of a tornado?

Winds moving in different speeds and directions at different altitudes cause the rising air to start spinning. Air that spins as it rises is typical in a supercell, the strongest type of thunderstorm, but not all spinning air creates a tornado. For a tornado to form, there also needs to be spinning air near the ground.

Tornadogenesis...A New Understanding

A dark funnel descending from a rotating wall cloud...this classic view of a developing tornado has been seen time and again in film and video, both fiction and non-fiction.

Dr. Jana Houser

Recent observational evidence now looks to largely disprove this "top down" theory of tornado formation. Using rapid-scan radar data alongside visual observations of tornadoes, both weak and strong, a team led by Dr. Jana Houser of Ohio University has shown that tornadoes are more likely to develop in a "bottom up" manner.

The rapid-scan mobile radar used for this study was able to take a complete scan every 30 seconds, compared to the conventional National Weather Service network of radars which can only complete a full scan every 5 minutes. The time frequency with which radar data is collected is very important to gleaning a better understanding of tornado formation, as this study showed that tornado formation usually occurs in as little as 30-90 seconds. In addition, having radar data very close to ground level (less than about 100m) is also important to the early detection of tornadoes. The El Reno tornado of 2013 proved this as it showed tornado-strength rotation only at around 30m off the ground for a full minute before the tornado fully developed. Three other tornadoes in Kansas and Oklahoma were studied in this same manner, and of the 4 tornadoes, none of them showed a "top down" formation in the rapid-scan radar data.

So, what does this new observational evidence tell us about the future of tornado forecasting? It tells us that in order to increase tornado warning lead-times radar data will have to be collected more frequently to capture the short time scale of tornado development. More importantly, it shows that storm spotters and new storm-scale resolution computer models will be important avenues to improving tornado warnings.

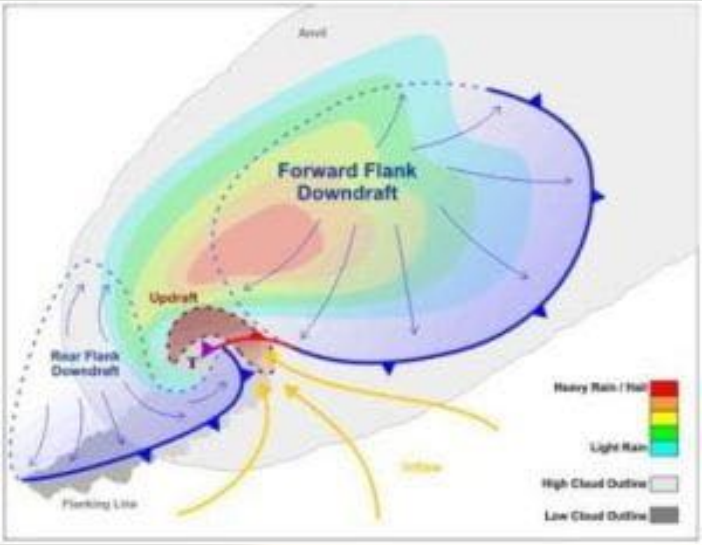
What are the three steps leading to Tornadogenesis?

Tornadogenesis appears to occur in one of three ways: (1) top down process (a dynamic pipe effect), (2) bottom up process,

and (3) vortex breakdown. With this process, tornadoes descend from midlevels within the thunderstorm and then emerge from the base of the wall cloud.

RFD

The rear flank downdraft is a region of dry air wrapping around the back of a mesocyclone in a supercell thunderstorm. These areas of descending air are thought to be essential in the production of many supercellular tornadoes.



The rear flank downdraft (RFD) develops when winds in the middle and upper levels of the atmosphere hit the back side of the updraft. The updraft is strong enough that some of that air is pulled in, bring some precipitation with it, and wraps around the updraft, while other air is deflected down to the surface.

A region of dry air subsiding on the back side of, and wrapping around, a mesocyclone. It often is visible as a clear slot wrapping around the wall cloud.

This air originates from the mid levels of a storm as mid-level Jetstream winds interact. And wrap around a mesocyclone. This air is then forced downwards by the storm in the rear portion of the cell.

The rear-flanking downdraft, known also as the clear slot, is thought to be a major key in tornadogenesis. It's a region of dry air wrapping itself around the mesocyclone (rotating updraft); people commonly talk about looking for wall clouds to see if a tornado is going to form, but the clear slot is an excellent area of observation. You won't always see wall clouds. You may not even always have an RFD slot, either, but the clear slot region is helpful in the process of storm spotting and chasing. Your typical, cyclonic tornado is likely to appear at the northern end of the "horseshoe" cloud you see as the visual RFD. Don't let your guard down, though- sometimes an anti-cyclonic tornado can fire up on the south end of the horseshoe.

Source: *From 12/11/22, 8/25/24, and 2/22/26 presentations by Scott Whitfield and others.* ***Image credit:*** *Dr. Jana Houser, Ohio State Univerity.*

RADIO QUEST
TECHNICIAN LEVEL

	Found an Elmer(someone to answer how-to questions)
	Listened on a frequency before talking
	Used your call sign on your handy talkie(HT)
	Spoke to another person on a regular (simplex) frequency)
	Spoke on club repeater
	Sent an APRS update
	Logged in on QRZ.com and created a logbook
	Made a contact via satellite/ISS on an HT
	Got my grid location
	Gave a signal report
	Send a CW/Morse code CQ
	Attended a ham club meeting
	Joined the ARRL
	Checked-in on a club info net
	Asked a question on a net or a club meeting
	Joined breakfast Eyeball QSO on Saturday
	Passed a license exam
	Signed up for EchoLink
	Bought a cheap Chinese radio
	Bought an expensive Japanese radio
	Built a radio
	Built a j-pole/2m antenna
	Made a balun
	Made an RF choke
	Made a go-bag/go-box
	Went on a POTA expedition
	Asked a new contact what radio/ antenna they were using
	Was asked what radio/antenna you are using
	Served as a net control operator
	Join the ARRL

CHECK ALL THAT YOU HAVE COMPLETED. HAVE YOU FULFILLED THIS MONTH'S QUEST?

DO YOU HAVE SUGGESTIONS FOR NEXT MONTH'S RADIOQUEST?
LET ME KNOW HOW YOU DID. POST SCREENCAPS ON FACEBOOK FOR BRAGGING RIGHTS!

You can't think of anything new to do with your radio?

Here are a lot of suggestions. Should you come up with a new one, let me know.

BTW, If you have done all these things, it's time to level up! We have a testing sessions in the area just about every week.

RADIO QUEST
GENERAL LEVEL

	Tuned up your first HF frequency
	Made a DX contact(out of the continental US)
	Joined a traffic net
	Sent a radiogram
	Worked a Field Day contact
	Participated in a contest
	Used a digital mode
	Sent an email over the radio
	Connected your radio to the computer/internet
	Used a SWR meter
	Grounded your station
	Grounded your antenna
	Applied a lightning arrestor
	Drove a ground rod
	Computed RF emissions for your station
	Ran your station on a battery
	Powered your station from a car power supply
	Created your first scratch paper log
	Installed logging software(such as hamrs/n1mm)
	Logged on to LOTW
	Used a pi*star
	Used a Watt meter
	Made a counterpoise
	Threw a wire up in a tree for an antenna
	Know who Dave Cassler is
	Have given a Roger Roger (RR)
	Stood on a ladder and wondered *"Will it antenna?"*
	Joined RACES
	Listened to a weather net

CHECK ALL THAT YOU HAVE COMPLETED. HAVE YOU FULFILLED THIS MONTH'S QUEST?

DO YOU HAVE SUGGESTIONS FOR NEXT MONTH'S RADIOQUEST?
LET ME KNOW HOW YOU DID. POST SCREENCAPS ON FACEBOOK FOR BRAGGING RIGHTS!

JOIN THE ARRL

About ARRL®

ARRL The National Association for Amateur Radio® was founded in 1914 as The American Radio Relay League, and is a noncommercial organization of radio amateurs. ARRL's mission is to promote and protect the art, science, and enjoyment of amateur radio, and to develop the next generation of radio amateurs. ARRL supports members with opportunities to discover radio, to develop new skills, and to serve their local communities. ARRL's youth initiatives include programs to inspire students and advance STEM education through amateur radio, and to encourage pathways to higher education and careers in wireless communications and related technical fields. ARRL is also the Secretariat of the International Amateur Radio Union (IARU). For more information about ARRL and amateur radio, visit www.arrl.org.

New To RIT & XIT?

By Michael Payne K5MFP
michaelpaynek5mfp@gmail.com

If you are a new ham or new to HF radios, you might be interested in the RIT and XIT controls. What are they you ask? RIT stands for Receiver Incremental Tuning and XIT stands for Transmitter Incremental Tuning and using them can make transmitting and receiving QSO's more enjoyable. These let you fine tune your receive and transmit frequencies when you talk to someone on the air and correction in frequency is slightly off. Instead of trying to get on the frequency with the main VFO knob, you can fine tune your radio with RIT and XIT controls.

If a person you're talking to drifts slightly off frequency and sounds funny, you can just use the RIT control until you hear them better. The same thing goes with the XIT control. When you are told that you are off frequency, just turn the Transmit Incremental Tune (XIT) control until they say that you are on frequency. These two controls usually shift up or down in 10kHz increments. Note: The RIT addusts the receive frequency and does not change the transmit frequency but the XIT only changes the transmit frequency and not the receive frequency.

CLUB CALENDAR

MARCH

Sunday 1	Monday 2	Tuesday 3
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	**7p** GARC (Garland) 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 **K1USN Slow Speed Test** **ICWC Medium Speed Test** **OK1WC Memorial** **RSGB 80m Club Championship, Data**	**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 **Worldwide Sideband Activity Contest** **ICWC Medium Speed Test** **ARS Spartan Sprint** **AGCW YL-CW Party**
8 **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 **International DX-Phone** **SKCC Sprint Europe** **Novice Rig Roundup** **ARRL Inter. DX Contest, SSB** **FIRAC HF Contest** **Classic Exchange, CW**	**9** **7:30p** Texas ARES Net @ 3.873 MHz **8:30p** MARC Simplex net **SKCC Sprint Europe** **Novice Rig Roundup** **Classic Exchange, CW** **4 States QRP Group Second Sunday Sprint**	**10** **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 **SKCC Sprint Europe** **Novice Rig Roundup** **Classic Exchange, CW** **DARC CW-Training Contest**
15 **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 **SARL VHF/UHF FM Contest** **SARL Field Day Contest** **Commonwealth** **SKCC Weekend Sprintathon** **EA PSK63 Contest** **F9AA Cup, SSB** **South America 10 Meter Contest**	**16** **6p** VE Testing @ K5PRK **7p PARK Monthly Meeting** **7:30p** Texas ARES Net @ 3.873 MHz **8p** American Legion Post 315 Radio Club Net @ W5SRA **8:30p** MARC Simplex net **Idaho QSO Party** **Wisconsin QSO Party** **Run for the Bacon QRP Contest**	**17** **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
22 **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 **BARTG HF RTTY Contest** **Russian DX Contest** **Virginia QSO Party** **UBA Spring Contest, SSB**	**23** **7p** GARC (Garland) 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 **BARTG HF RTTY Contest**	**24** **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
29 **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 **CQ WW WPX Contest, SSB** **Africa All Mode International DX Contest** **CERT Train and Trainer Class Burleson**	**30** **7p** DARC (Dallas) Geek Net **7p** GARC (Garland) Club Meeting **7:30p** Texas ARES Net @ 3.873 MHz **8:30p** MARC Simplex net **QCX Challenge**	**31** **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 **QCX Challenge**

CLUB CALENDAR

MARCH

Wednesday 4	Thursday 5	Friday 6	Saturday 7
6:50p NTx Readiness QST Net @ 7.27750 MHz LSB **8p** N5SAC Weekly Info Net @ W5SRA **8p PARK Informal Net @ 147.180+ MHz, (107.2)** **8p** Simplex Net @ 146.54 MHz QRP Fox Hunt Phone Weekly Test A1Club AWT CWops Test Mini-Test 40	**11a** GARC (Garland) Crony Lunch @ Judy's Cafe **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net CWops Test VHF-UHF FT8 Activity Contest-NA Walk for the Bacon QRP Contest NRAU 10m Activity Contest	***8:30,9a*** North Texas Hospital Radio Club weekly check in CWops Test NCCC FT4 Sprint Weekly RTTY Test QRP Fox Hunt NCCC Sprint K1USN Slow Speed Test Walk for the Bacon QRP Contest	**12p** Garland "Hands-On" Gathering **7p** DARC (Dallas) Tech Net **9p** Saturday Night D-STAR Net@REF029A International DX-Phone SKCC Sprint Europe Novice Rig Roundup ARRL Inter. DX Contest, SSB Wake-Up! QRP Sprint Irving Hamfest
11 **6:50p** NTx Readiness QST Net @ 7.27750 MHz LSB **8p** N5SAC Weekly Info Net @ W5SRA **8p PARK Informal Net @ 147.180+ MHz, (107.2)** **8p** Simplex Net @ 146.54 MHz SKCC Sprint Europe Novice Rig Roundup Classic Exchange, CW VHF-UHF FT8 Activity Contest RSGB 80m Club Championship, CW	**12** **11a** GARC (Garland) Crony Lunch @ Judy's Cafe **7p** HAM (Mesquite) Monthly Meeting **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net SKCC Sprint Europe Novice Rig Roundup VHF-UHF FT8 Activity Contest-NA	**13** ***8:30,9a*** North Texas Hospital Radio Club weekly check in SKCC Sprint Europe Novice Rig Roundup	**14** **9a** W5YI VE Test Session @ Wylie **7p** DARC (Dallas) Tech Net **9p** Saturday Night D-STAR Net@REF029 SKCC Sprint Europe Novice Rig Roundup YB DX RTTY Contest SARL VHF/UHF FM Contest SARL Field Day Contest Commonwealth SKCC Weekend Sprintathon EA PSK63 Contest F9AA Cup, SSB
18 **6:50p** NTx Readiness QST Net @ 7.27750 MHz LSB **8p PARK Informal Net @ 147.180+ MHz, (107.2)** **8:30p** NTx ARES Net **8p** Simplex Net @ 146.54 MHz IRTS 80m Counties Contest VHF-UHF FT8 Activity Contest-NA	**19** **11a** GARC (Garland) Crony Lunch @ Judy's Cafe **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net Walk for the Bacon QRP Contest NAQCC CW Sprint NTC QSO Party	**20** ***8:30,9a*** North Texas Hospital Radio Club weekly check in Walk for the Bacon QRP Contest	**21** **9a** W5SRA Laurel VE Test Session **9a** GARC (Garland) ECC Open House **7p** DARC (Dallas) Tech Net **9p** Saturday Night D-STAR Net@REF029A PODXS 070 Club St Patrick's Day BARTG HF RTTY Contest Popov Memorial Contest AGCW VHF/UHF Contest Virginia QSO Party Feld Hell Sprint Virtual Skywarn
25 **6:50p** NTx Readiness QST Net @ 7.27750 MHz LSB **7p** Murphy CERT Net @ W5SRA 8p N5SAC Weekly Info Net @ W5SRA **8p PARK Informal Net @ 147.180+ MHz, (107.2)** **8p** Simplex Net @ 146.54 MHz SKCC Sprint UKEICC 80m Contest	**26** **11a** GARC (Garland) Crony Lunch @ Judy's Cafe **12p Fourth Thursday Lunch @ Poor Richard's Cafe** **7p** N5SAC Club Meeting **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net RSGB 80m Club Championship, SSB	**27** ***8:30,9a*** North Texas Hospital Radio Club weekly check in Sasquatch Stomp CQ WW WPX Contest, SSB CERT Train and Trainer Class Burleson	**28** **7p** DARC (Dallas) Tech Net **9p** Saturday Night D-STAR Net@ REF029A Sasquatch Stomp CQ WW WPX Contest, SSB Bill Windle QSO Party Africa All Mode International DX CERT Train and Trainer Class Burleson
1 **6:50p** NTx Readiness QST Net @ 7.27750 MHz LSB **8p** N5SAC Weekly Info Net @ W5SRA **8p PARK Informal Net @ 147.180+ MHz, (107.2)** **8p** Simplex Net @ 146.54 MHz VHF-UHF FT8 Activity Contest UKEICC 80m Contest	*2* **11a** GARC (Garland) Crony Lunch @ Judy's Cafe **8p** GARC (Garland) InfoNet **8p** Denton County ARES Training Net Walk for the Bacon QRP Contest Maundy Thursday Contest SARL 80m QSO Party SKCC Sprint Europe NRAU 10m Activity Contest	*3* ***8:30,9a*** North Texas Hospital Radio Club weekly check in Walk for the Bacon QRP Contest	*4* **7p** DARC (Dallas) Tech Net **9p** Saturday Night D-STAR Net@ REF029A PODXS 070 New Member Jamboree EA RTTY Contest Louisiana QSO Party Mississippi QSO Party SP DX Contest