NCARC Tri-Bander

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From the NCARC President

Joe Hawley KDØTYU

president@ncarc.co

As we head into the warmer months, the Northern Colorado Amateur Radio Club has a big and exciting summer ahead! We're looking forward to continuing some of our favorite traditions, including our annual HF in the Park event and our summer picnic—both great opportunities to get on the air, enjoy the outdoors, and spend time with fellow members and families.

We're also planning to bring you more Rosin Corps sessions—hands-on opportunities where you don't just learn about equipment, you actually build and work with it. These sessions have been a hit, and we're excited to expand them further. And yes… we have a few surprises in store this summer that you won't want to miss!

Coming up soon, on March 28th, we'll be hosting our hands-on "Hamlet" class—something we've been refining. We've been calling it: "Now that I've got my license, what do I do with it?" This time, we're taking it a step further. Instead of just talking about radios, we're putting them directly in your hands and getting you on the air.

This practical, real-world experience will be a big step forward from how we've done things in the past, and we're excited to see how it helps new hams get comfortable and confident.

Also, don't forget about our upcoming club meeting. Greg will be joining us once again—always an engaging and informative speaker—and this time he'll be talking about six meters and why it's such an interesting and useful band.

Thank you all for your continued support of the Northern Colorado Amateur Radio Club.

We've got a lot to look forward to, and we hope to see you at the meeting this Saturday!



NCARC Club Meeting

March 21, 2026

8:30 am Golden Corral opens- breakfast and socialize, **9:00 am** club meeting

In Person and online

Zoom streaming - All members will receive a link to the online broadcast.
If you don't receive a link by Friday before the meeting, please email treasurer@ncarc.net
You choose what you feel comfortable doing: attend in person or online.

Topic:

6 meters

Greg Ella, NØEMP

Location:
The Golden Corral
1360 Sculptor Dr, Loveland CO 80537

Officer Elections

The Northern Colorado Amateur Radio Club currently held elections at the last meeting, and we welcome Pete Robbins WØRCR as our new Treasurer and Randy Barnett KØRUW as our new Public Affairs Officers. These folks will serve until July.

In May we will be holding the "official" elections, and everyone is welcome to run for any of the officer positions. If you are interested, get your nominations to Joe Hawley, president@ncarc.co by the end of the April meeting.

Your involvement and support are crucial to the continued success of our club. Thank you so much for your dedication to the Northern Colorado Amateur Radio Club.

Interested in helping with the ARRL Year of the Club events?
Please contact Joe Hawley and volunteer!

Please Renew Your Membership for 2026!

Renew your NCARC membership.
It's quick and easy.
Click here!

Treasurer's Report

Pete Robbins WØRCR
treasurer@ncarc.co

A huge thank you to Bob Nauta, WØBNC, for keeping the club books up to date these past two years. Thank you to all members who renewed their membership for 2026, your support helps us continue our mission!

Also, welcome to our newest members, we look forward to hearing you on the air or meeting you at a future event.

New Members:

KFØWRC
KFØWRD
KFØWRE
KFØWRF
KFØWRG
KJ6RPJ

February 2026

Beginning Balance	$17,793.88
Income	$1,030.00
Expenses	$3,731.13
Ending Balance	$15,092.75

Expenses: Storage and program expenses, Hamfest venue and raffle items, Red Feather project

Income: Memberships, raffle sales, Hamfest tables

Did You Know?

A regular contribution from Bob Schmid, WA9FBO

The All American Five

From Crystals to Tubes

Early AM broadcast receivers were crystal sets—cheap, simple, and not needing batteries—but everyone had to huddle over their own headphones. In 1914, Edwin Armstrong's regenerative receiver made vacuum-tube sets more sensitive and selective, leading to loudspeaker listening for groups.

The first commercial tube receivers of the 1920s were usually TRF (Tuned Radio Frequency) designs—effective but bulky and finicky to tune. Armstrong's 1918 introduction of the superheterodyne principle simplified tuning and greatly improved selectivity; by the 1930s, this design had become the standard in consumer radios.

The radios ran on either household power or batteries, and depending where you lived, that could pose problems. Many areas in the U.S. received DC rather than AC power, and radios with transformers wouldn't work on DC.

Batteries presented their own challenges. Many radios required multiple types: an "A" battery to heat the tube filaments, a "B" battery for plate voltage, and sometimes a "C" battery for grid bias. These batteries were expensive and could ruin carpets with acid stains.



Figure 1 - Electrodynamic Speaker

Speakers were another important part of early radios. Many used electrodynamic speakers (Fig. 1), where the B+ plate voltage powered a large electromagnet inside the speaker, which also helped filter the radio's power supply.

Floor-model radios of the 1930s were big, beautiful, and often treated like fine furniture. But they were also out of reach for many households. Manufacturers wanted something smaller, lighter, and more affordable that the average family could own.

America's Little Workhorse Radio

Over the next decade, refinements in tube design and cost-cutting brought the ultimate mass-market radio—the compact, affordable, and wildly popular All-American Five (AA5) (Fig. 2). Its patriotic-sounding name fit perfectly, since the basic circuit became common just before World War II. Manufacturers made millions of these sets, and they turned up in kitchens, living rooms, and garages all across America.



Figure 2 - All American Five

How They Cut the Cost

One of the biggest tricks was wiring the **tube filaments in series** so their voltages added up to match the power line. No filament winding, no transformer—perfect for AC *or* DC operation.

A typical postwar AA5 used these tubes:

1. **12BE6 – Pentagrid converter** (local oscillator + mixer) – 12.6 V filament
2. **12BA6 – IF amplifier** (455 kHz) – 12.6 V filament
3. **12AV6 – Detector + first audio** (diode detector and triode preamp in one envelope) – 12.6 V filament
4. **50C5 – Audio output** (power amp driving the speaker) – 50 V filament
5. **35W4 – Rectifier** (provides the B+ plate voltage from rectified line power) – 35 V filament

Total filament voltage: about **122.8 V**, just right for a 120 V mains supply.

Other Cost-Saving Measures

The **455 kHz IF** was a practical compromise—small transformers, good selectivity, stable tuning, and far enough from the AM broadcast band to minimize image problems.

- By the 1940s, most sets used a **loop antenna** built into the back panel, eliminating the need for an external longwire.
- Improved magnets made it possible for **permanent-magnet (PM) speakers** to replace electrodynamic types. Because PM speakers didn't require an electromagnet, they were smaller, lighter, and less expensive, though their volume output was generally lower.
- **Miniature tubes** replaced bulkier loctal or "G-type" tubes, saving space and cost.
- **The pentagrid converter tube** handled both oscillator and mixer duties, eliminating an entire stage.

Keeping the User Safe

The design posed a shock hazard: Without a power transformer, the chassis could be at a dangerous voltage depending on plug orientation. Plastic cabinets and long plastic shafts on knobs kept fingers away from the potentially "hot" chassis.

Some makers floated the "B–" (power supply return) from the chassis using a small capacitor or resistor. This helped reduce hum and leakage and made it easier to retrofit a polarized cord later.

The Downsides

- Wiring the filaments in series wasn't perfect. If one tube filament opened up, the whole set went dark—just like one bad bulb in an old string of Christmas lights. And with some designs, the **35W4 rectifier** had a filament tap to supply a low voltage for a dial lamp. If the bulb burned out, the surge could damage the rectifier. Fortunately, many drugstores had a tube tester, and they kept the common tube types in stock. You could test your own, buy a replacement, and be back in business in minutes.
- Plate voltage derived from the line was lower than with transformer-powered sets. With modest audio power and small speakers, these sets were limited to tabletop listening.
- Some models powered the dial lamp directly from a third wire in the power cord. The cord could get warm in use, leading to the nickname "curtain burner".

Variations

Some higher-end models added a tuned RF stage (sort of an "All American Six") for better sensitivity. Some kept using octal tubes into the 1940s before switching to miniatures.

An **Automatic Volume Control** feature fed a DC voltage from the detector stage back to control the gain of earlier stages, preventing loud stations from blasting your ears.

Conclusion

The All American Five was a brilliant compromise: simple, cheap, easy to make, and "good enough" for millions of households. They brought radio into homes that couldn't have afforded it otherwise, and they stayed on the air for decades.

Hamlet Hands-On Radio Class

The Northern Colorado Amateur Radio Club is hosting a hands-on Hamlet class. This session is perfect for beginners and technician-class licensees interested in learning to operate repeaters, simplex handheld radios, mobile radios, and even HF. We will have radios and equipment available for you to try out, and you can bring your own.

If you're interested, please click here to sign up or visit ncarc.co to register.

We are also looking for volunteers to help with the event. Please contact Joe Hawley for more information.

Class Date: Saturday, March 28, 10 am

Location: 235 Regina Dr, Fort Collins

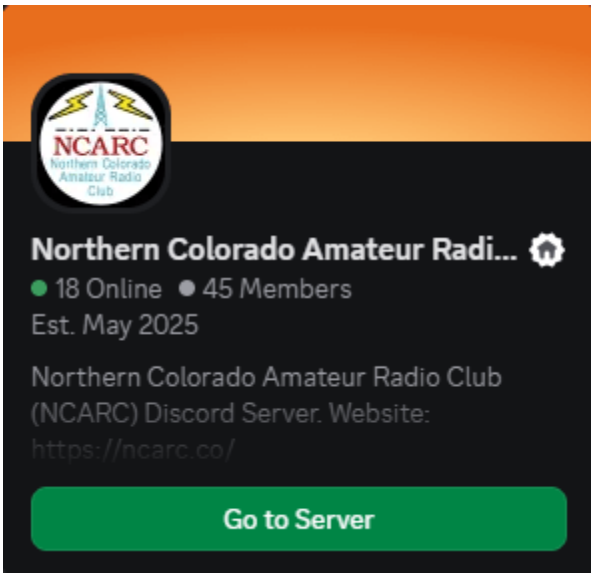
Cost: Free

What's included?

- Free instruction from experienced hams
- Hands-on operation of handheld radios: repeater use & simplex HF on 10 meters
- Technician mobile radios: installation and simple antenna use

We hope to see you there!

Join our NCARC Discord Server!



My Ham Radio Epiphany in November 2024, courtesy of John Moore

By Phil Power KFØTBO

During an engaging conversation with Ann Donoghue at the NCARC's 2025 Holiday Party, Ann asked me: "So how did you get started in Ham Radio?"

I outlined advice I received courtesy of John Moore, a retired private investigator. John has decades of military and civilian experience in security and journalism. His website is The Liberty Man. He was a featured presenter at the 2024 Red Pill Expo (full video of his presentation is posted here).

John's presentation was titled: "Was the Moon Landing Reality of Theatre?" On the surface, you may ask: "How was this presentation the catalyst for you to become interested in Ham Radio?" Towards the end of his presentation (at the 54:20 minute mark), John made a number of statements that immediately grabbed my attention and catapulted my awareness of critical skills needed in emergency situations. To paraphrase John's advice:

- To prepare for emergencies, you are encouraged to develop two skills that will be in the shortest supply and the greatest demand:
  - CPR, and
  - Ham Radio Skills
- In emergencies such as the hurricanes in North Carolina, when the police could not talk with each other and cell phones didn't work, the Ham Radio guys and gals stepped up to the plate and made communications possible.
  - Seek out your local Ham Radio Club. The best place to get started is the AARL.org website.

On November 16, 2024, I took John's advice and located NCARC, Joe Hawley's email and phone number. After a great chat with Joe, I located the HamTestOnline courses and have acquired my Technician and General licenses.

Upcoming Ham Radio Events

Hamlet Hands-On Class: Mar 28, 2026, 235 Regina Dr, Fort Collins, CO. More info here.

Quad Rock Race Event: May 9, 2026, Lory State Park, Fort Collins, CO. More info here. Contact Ron KØAZA

Never Summer Race Event: Jul 24-26, 2026, Gould, CO. More info here. Contact Wayne ADØKE

Red Feather Trail Jamboree: Sep 25-27, 2026, Red Feather, CO. More info here. Contact Bryan NØBCB

Blue Sky Marathon: Oct 17, 2026, Fort Collins, CO. More info here. Contact Ron KØAZA

Weekly On Air Events

FoCo CW Round Table, Tuesdays, 8:00 pm MT, 7.118 +/- for QRM. More info here.
NCARC Tech Net, Mondays, 6:00 pm MT, 447.275 (100 Hz tone)
NCARC Club Net, Wednesdays, 6:30 pm MT, 447.275 (100 Hz tone)

Biweekly Get Together

Martinez-Clarke Luncheon: every other Wednesday, 11:30 am, (next one Apr 1, 2026) Perkins Restaurant, 2222 W Eisenhower Blvd, Loveland, CO

From the Editor

Ann Donoghue KØARD
newsletter@ncarc.net

Spring is springing, and the snowpack is the lowest since 1981. We could be in for a severe fire season, and ham radio operators will be more important than ever. Get your radio going and practice on air!