NCARC Tri-Bander

Volume 7, Number 7 July 2026

From the NCARC President

Joe Hawley KDØTYU
president@ncarc.co
970-689-0828

Summer has arrived, and we have a lot of exciting activities planned for the Northern Colorado Amateur Radio Club!

We recently held our first Rosin Corps event of the summer and built a Flowerpot Antenna Build, which I would call a great success. Sixteen members joined us to build dual-band Flowerpot antennas, and I'm happy to report that every antenna was tested and performed just as it should. A big thank you to everyone who attended and to the volunteers who helped make the event run so smoothly.

Our next big event is **HF in the Park**, and I encourage everyone to come out and join us. This is a great opportunity to see a variety of HF stations in operation, along with many different types of antennas, both homemade and commercially manufactured. If you would like to volunteer by bringing your own radio equipment and antenna setup to demonstrate, we would love to have you participate. The more operating positions we have, the more everyone can learn.

Looking ahead, don't forget our annual club picnic in September. It's always a great time to get together with fellow members, enjoy some good food, and share stories about amateur radio.

We're also working on additional educational opportunities. I'm putting together a radio programming class along with a General Amateur Radio class, which we hope to offer during the first couple of weeks of October. We'll share more details as the plans are finalized.

Finally, I'd like to thank every one of you for your continued support of the Northern Colorado Amateur Radio Club. Thanks to the hard work of our officers, board members, committee chairs, and many dedicated volunteers, we have some exciting improvements on the horizon. We'll be revamping our website and updating several of the ways we operate to serve our members better.

The future of our club is bright, and I'm looking forward to seeing many of you at our upcoming events.

NCARC Club Meeting

July 18, 2026

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

In Person and online

Join Zoom Meeting
https://us06web.zoom.us/j/88127185059?pwd=QYfk8vaWa08xqbNeLauKp6qb2qW1af.1

You choose what you feel comfortable doing: attend in person or online.

Topic:

Ham Radio Satellite Communications

Doug Tabor N6UA and RJ Briggs

We will also be voting on a new membership proposal: moving from a fixed January 1 renewal date, to an anniversary-based renewal date.

Location:

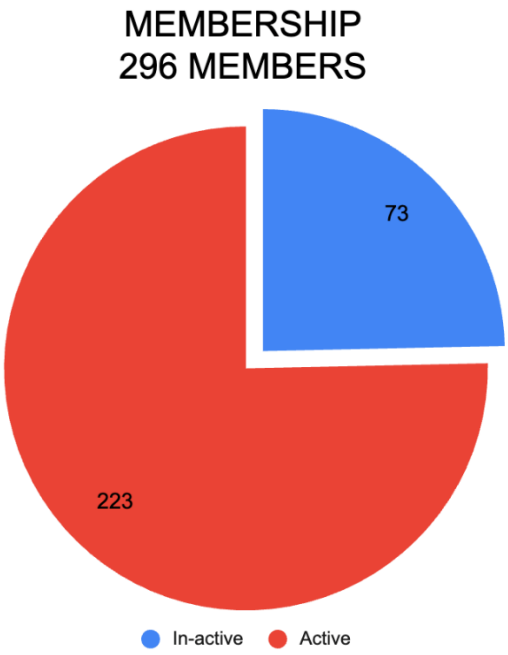
The Golden Corral
1360 Sculptor Dr, Loveland CO 80537

Treasurer's Report

Pete Robbins WØRCR
treasurer@ncarc.co

Here are some highlights for June:

- **New Members:** We are thrilled to welcome 1 new ham to the club this past month.
- **Membership Term:** Once the change to the club by-laws are approved we will implement anniversary-based annual membership. Your membership will start and renew when you last paid or when new members sign up.



Finances

Opening Balance	$17,408.92
Incoming	$26.63
Outgoing	$284.49
Ending Balance	$17,151.06

Income:	**Expenses**
• Membership Dues	• Parts • Storage • Event supplies

Please welcome our newest club member:

NØDDC

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

Please Renew Your Membership for 2026!

Remember – your dues are due in **January**!
If you haven't paid yet, you are past due.
Renew your NCARC membership now!
It's quick and easy.
Click here!

Membership Renewal Proposal

The Board of Directors would like to present a proposal for your consideration and vote regarding club membership.

Currently, all NCARC memberships expire on December 31 of each year, regardless of when a member joins. We are proposing a change to a rolling membership system, where a member's renewal date would be based on the date they join or renew their membership.

For example, if a member joins on July 15, their membership will remain active until July 15 of the following year. Their renewal date would remain July 15 each year thereafter.

We believe this change offers several benefits:

- Members receive a full year of membership regardless of when they join.
- New members who join mid-year would not have to pay for a partial year and then renew again at the end of the calendar year.
- The renewal process becomes fairer and easier for all members.
- Our automated membership system will allow us to track renewal dates efficiently and send reminders well in advance of expiration.

The Board believes this change will improve the membership experience and simplify renewals for both members and the club.

We ask that you cast your vote either **Yea** (in favor of the proposal) or **Nay** (opposed to the proposal) at the next club meeting on July 18th.

Rosin Corps Project: Flowerpot Antenna Build a Great Success!

By Joe Hawley KDØTYU

On Saturday, July 11, 2026, the Northern Colorado Amateur Radio Club held another one of our popular Rosin Corps project events, this time building the dual-band Flowerpot antenna. Sixteen members joined us for a fun and educational day of hands-on learning, teamwork, and antenna building.



This project was a little different from our previous Rosin Corps events. Normally, each participant assembles their own kit while instructors move from table to table helping individuals as needed. This time, however, everyone worked together as one team. Members helped each other measure and cut PVC pipe, assemble the antenna elements, solder connections, and complete the final assembly. It quickly became a true group effort, with everyone sharing ideas, lending a hand, and learning from one another.

One of the highlights of the day was teaching participants how to test their completed antennas properly. After everyone finished building, we took the antennas outside and tested each one. The results were outstanding! Every antenna performed exceptionally well. While a 1:1 SWR is considered perfect, the highest SWR we measured was only 1.3:1, an excellent result that any amateur radio operator would be happy with. It was very rewarding to see every antenna work so well right from the start.



Although Mother Nature certainly challenged us with temperatures approaching 100 degrees, the heat didn't dampen anyone's enthusiasm. Everyone stayed engaged throughout the day, and there were plenty of smiles, conversations, and opportunities to learn something new. The teamwork and camaraderie made the event enjoyable for everyone involved.



A special thank you goes to **Greg Ella** NØEMP for generously allowing us to use his outbuilding to host the event. Greg also spent considerable time machining several of the specialized parts used in the Flowerpot antenna and was instrumental in assisting participants throughout the build.



We would also like to thank **Jim Gale KF**ØLAN, who volunteered his time helping participants with soldering techniques, antenna assembly, and final testing and tuning. Everyone greatly appreciated his experience and willingness to teach.

Events like these are exactly what the Rosin Corps program is all about—bringing members together to learn new skills, build practical amateur radio equipment, and enjoy the fellowship that makes our club so special.

Thank you to everyone who attended and helped make this event such a tremendous success. We look forward to seeing you at our next Rosin Corps project!

HF in the Park Event Coming Up!

By Joe Hawley KDØTYU

On August 8, we will hold our annual HF in the Park event. This is a great opportunity for anyone who has never operated on HF frequencies to learn more about what HF is, how to get started, and the different types of equipment and antennas that can be used. We'll have a variety of stations on display, featuring both commercially purchased and home-built equipment.

We're looking for volunteers and participants who would be willing to bring and set up their HF equipment for the event. We will be at Centennial Park, located at **977 West 1st Street in Loveland**, and activities will begin around **1:00 PM**. Participants are welcome to arrive and set up at any time during the afternoon. Power is available at the location.

James will provide an overview of HF radio, including how to get on the air and how HF differs from VHF and UHF operation. We've hosted this event for many years, and it has always been a successful and enjoyable learning experience.

If you'd like to help out or bring equipment to demonstrate, please send me a note or give me a call. I'd love to hear from you.

NCARC Elmer Group

By Joe Hawley, KDØTYU

The Northern Colorado Amateur Radio Club is looking for volunteers to become part of our new **Elmer Group**.

One of the greatest strengths of amateur radio is experienced operators helping others learn and grow. We want to build a team of volunteers who are willing to share their knowledge and lend a hand to both new and returning hams.

As an Elmer, you might help members with:

- Choosing the right radio or antenna for their needs.
- Installing radios, antennas, and related equipment.
- Programming handhelds and mobile radios.
- Learning new operating modes such as DMR and other digital technologies.
- Answering general amateur radio questions and providing encouragement.

Whether you're helping someone get their first station on the air or assisting a longtime operator who wants to explore something new, your knowledge and experience can make a real difference.

We're not asking for a huge time commitment, just a willingness to help when you're available. This is a valuable service that NCARC can provide to our members and one that will strengthen our club for years to come.

If you're interested in volunteering, please let me know. You can send me an email, give me a phone call, or stop me before or after one of our meetings. I'd be happy to answer any questions.

Thank you for supporting the Northern Colorado Amateur Radio Club and for helping us make amateur radio more enjoyable and accessible for everyone.

Silent Key: Virgil George Leenerts WøINK *(Full obituary here.)*

Virgil George Leenerts age 89, of Loveland, died at his home on 23 June 2026. Virgil was born on a farm in Golden, Illinois on 21 October 1936, to George H. Leenerts and Mathilda R. Saathoff Leenerts.

Virgil's interest in electronics began when the Leenerts home electricity installed in 1948. Virgil constructed a functional workbench upstairs in his bedroom to investigate electronics, and learn how to repair or create electronic devices. Interactive learning included projects on the family farm, volunteering to repair radios and telephones in the community and progressing to short-wave radios. Virgil earned his amateur radio license as a high school senior. He joined the Institute of Radio Engineers (IRE) in the 1962 (now known as the Institute of Electrical and Electronics Engineers (IEEE)).

After serving in the United States Air Force (USAF), Virgil earned a Bachelor of Science degree in Electrical Engineering from the University of Illinois Urbana-Champaign in 1963. He accepted a job at Hewlett-Packard (HP) Company in Loveland and spent 38 years there as a Research & Development Engineer. He worked in multiple departments designing electronics products. A highlight project Virgil enjoyed was working on the 3585 Spectrum Analyzer design. Virgil traveled to several countries as a subject matter expert in Design Engineering Virgil retired from HP in 2001. Virgil married fellow HP employee Ellen Pacas in 2002 and enjoyed 20 happy years together until her death in 2022.

Virgil, the inventor, earned a patent titled Standing Wave Ratio Measurement Instrument (1978) and a shared patent titled Isolated DC to DC Converter (2006). These additional accomplishments were enabled by the fully equipped electronics lab he built from scratch in the basement of his home. Engineering was Virgil's profession and hobby. In 2001, Virgil created his own business named Golden "L" Electronics, LLC. He spent many years post-retirement working as an entrepreneur and professional engineering consultant with many companies, writing many supportive technical documents on test or communications equipment. Virgil's last projects were helping to restore and make fully functional World War II communications equipment.

Virgil, WøINK, founded the Loveland Repeater Association (LRA) in 1978 and directed activities to build a repeater site located on Namaqua Hill. He authored several articles that were published in the ARRL magazine and QEX magazine. Virgil lectured on many amateur radio related presentations.

Virgil stated he wants to be remembered for his core values: cultivate fairness, to treat everyone equally, be non-judgmental, interface with people from all walks of life, have a willingness to share knowledge and skills, and for everyone to realize there is more to life than serving oneself. Services: 11:00 MDT on 12 August 2026 at Zion Lutheran Church, 815 E. 16th Street, Loveland, CO 80538

Tech Report

James Cizek, KIØKN
techchair@ncarc.co

July 2026

I am continuing to investigate a solid GPS solution for our sites. **Horsetooth** and **Buckhorn** both seem to have continuing problems with GPS and they both rely on them for our voting receivers to function properly. Hopefully we'll find something that's affordable but more robust than our current solution. More to come on this topic, but for the time being, both sites are on temporary solutions and continue to work normally.

Nunn

The antenna has been replaced at Nunn and this restored the repeater to normal performance. There is still some audio noise on the signal that needs to be traced down, but the system is 100% usable again. Many thanks to a pair of guest climbers K7AIH and NM0TH from Rocky Mountain Ham that were able to get this done on my behalf last week.

Grover

Grover is next on the list. We'll change the repeater from a 20 watt Kenwood to a 100 watt Motorola MTR2000 repeater (matching what we use on almost all of our other sites). As a reminder, it will change frequency from from 449.600 to 449.500 and we'll raise the antenna somewhat as well.

Rattlesnake

We had a 60ghz microwave link that decided to stop communicating with Horsetooth for some reason. A quick reboot restored that link. Thanks to N0EMP for the rescue on that radio. Since we have multiple paths into that site, we never lost any connectivity but with that link restored, redundancy is also restored.

Red Feather

Red Feather continues to be very healthy and operate as it should. We'll continue to watch battery levels, particularly when winter sets in and snow starts to fall, but so far, every indication is that we'll be in great shape.

Overall

With the exception of some cleanup items at a few of our sites, things are generally running well.

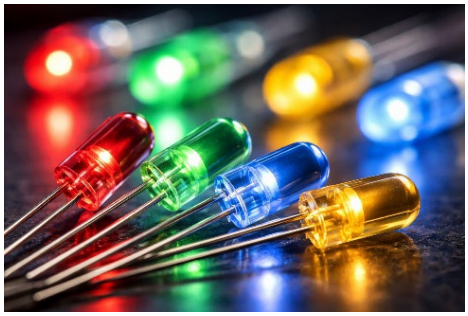
Did You Know?

A regular contribution from Bob Schmid, WA9FBO

Light Emitting Diodes (LEDs)

In 1907 British scientist Henry Round of Marconi Labs, while experimenting with cat's-whisker detectors, applied a voltage to a silicon carbide (SiC) crystal and saw a faint yellowish-green glow where the metal whisker contacted the crystal. In the 1920s Russian scientist Oleg Losev observed that SiC crystals emitted light when forward-biased and theorized it was caused by recombination of electrons and holes in the material.

These discoveries remained curiosities because the physics behind semiconductors was not well understood, high-purity materials were not available, the light was dim, and incandescent and gas-discharge lamps were dominant. The practical LED had to wait until the 1960s, when advances in semiconductor materials, doping techniques, and crystal growth made it possible to produce bright, efficient light sources.



Red LEDs

In 1962 Nick Holonyak Jr. developed the first visible-spectrum LED bright enough for practical use by using gallium arsenide phosphide (GaAsP). It emitted red light, a breakthrough because previous LEDs were infrared and mainly used for sensing. Early red LEDs were usable but not especially bright, and were mostly limited to calculator displays, clocks, watches, and instrument panels.

Green and yellow LEDs

In the late 1960s, improvements in semiconductor materials led to the development of green and yellow LEDs, but the brightness was still low due to indirect bandgap materials.

In 1972, electrical engineer M. George Craford used GaAsP but increased the phosphorus-to-arsenic ratio. This pushed emission from red toward orange and yellow and improved efficiency. Craford also developed a red LED that was roughly 10 times brighter than Holonyak's.

Efficiency breakthroughs

In the 1970s researchers developed more efficient LEDs using new materials like gallium aluminum arsenide (GaAlAs), making LEDs bright enough for practical use in displays and signage.

In the 1980s infrared LEDs became widely used in remote controls, and simple LED displays, including 7-segment numeric displays, became more common.

Blue LEDs

By the 1990s, red and green LEDs had been around for decades but blue LEDs were elusive because the right semiconductor material was difficult to find. In 1994 Japanese engineer Shuji Nakamura of Nichia Corporation developed a high-brightness blue LED using gallium nitride (GaN). It was a game changer.

White LEDs

Why was blue so important? To generate white light from LEDs, you can either combine red, green, and blue (RGB) LEDs, or use a blue LED with a phosphor coating that converts part of the blue light into longer wavelengths, which then mix to appear white (this is how most white LEDs work today).

Before blue LEDs, there was no practical way to produce white light using LEDs. Nakamura's work led to major advances in lighting, displays, and energy efficiency. For this breakthrough, Nakamura, along with Isamu Akasaki and Hiroshi Amano, were awarded the 2014 Nobel Prize in Physics for their work on blue LEDs. In 1996, the first practical white LED was demonstrated using this phosphor-converted approach, typically with yttrium aluminum garnet (YAG), and the method remains widely used today.

Modern LEDs

In the 2000s advances in efficiency and cost reductions allowed LEDs to replace incandescent and fluorescent bulbs in general lighting.

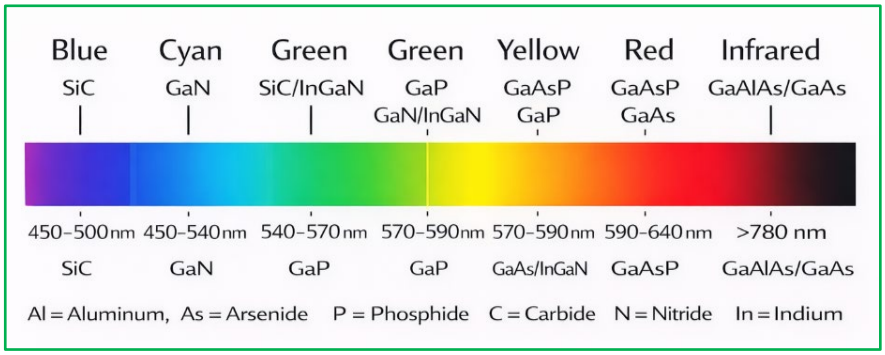
In the 2010s LED backlights became standard in TVs, and LEDs revolutionized automobile headlights.

And in the 2020s, cutting-edge technologies like MicroLEDs and quantum dots are being developed for ultra-efficient, high-resolution displays. Researchers have demonstrated LEDs whose emission wavelength can be tuned across multiple primary colors from a single device. This approach could reduce the need for separate red, green, and blue emitters in future high-resolution micro-LED displays, though it remains an active area of research rather than a fully commercialized technology.

How LED Color Works

An LED's color is set by the semiconductor material, not by voltage or current.

When an LED conducts, electrons fall across an energy gap called the bandgap. The size of that gap determines the wavelength of light that's emitted. Large bandgaps produce blue light; smaller bandgaps produce red or infrared.



Some LED materials are alloys, such as gallium arsenide phosphide (GaAsP). By changing the mix of elements in the crystal, engineers can tune the bandgap and shift the color from red toward orange or yellow.

That's why the chart links each color to a specific chemistry—and why some colors took decades longer to achieve than others.

Because of this, some materials appear in more than one color range on the chart. This doesn't mean they work equally well at every wavelength shown. In many cases, a material can emit light in a given color only weakly or inefficiently, while another material emits strongly at the same wavelength. The chart shows where light can be produced, not how bright or practical an LED will be.

Free Amateur Radio License Testing Available

The Northern Colorado Amateur Radio Club is committed to helping new and existing amateur radio operators earn or upgrade their licenses. That's why we offer free amateur radio testing sessions by appointment.

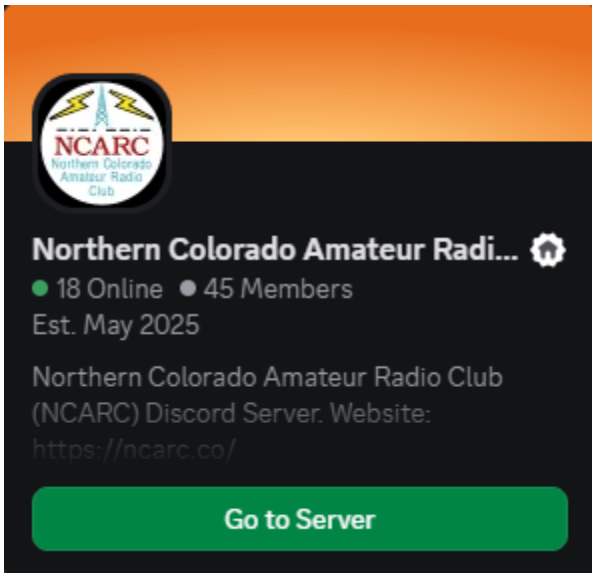
If you are ready to take your Technician, General or Amateur Extra exam, our Volunteer Examiners can often arrange a testing session at a time and location that works for you. We can meet at a local coffee shop, restaurant, community location, or other suitable venue. In some cases, we may even be able to come directly to your home.

We do ask for a few days' notice to coordinate our exam team, but in most cases, we can accommodate testing requests at almost any time.

Whether you're getting your first license or upgrading to the next level, we're here to help make the process as convenient as possible.

For more information or to schedule a test session, please get in touch with the club president Joe Hawley, KDØTYU, at president@ncar.co or 970-689-0828.

Join our NCARC Discord Server!



ARRL FIELD DAY AMATEUR RADIO FD★26 A NATIONAL RESOURCE JUNE 27–28

CQ Field Day, CQ Field Day, CQ Field Day. This is WØUPS

WHISKEY ZERO UNIFORM PAPA SIERRA. Calling CQ Field Day

What an incredible weekend! Field Day 2026 is officially in the logbooks. We had a fantastic turnout, learned a lot, and showcased the welcoming, communal spirit of our club. Thank you to Mike & Jan Backlund for letting us use their field again. Thank you to all the volunteers who showed up to help make this a great event. Thank you to all the members, new and old, who help visited with curious minds!

It was a HOT day, but we are really excited about the turn-out.

NCARC Field Day by the Numbers

- **Total Attendance:** About 45 members, family, and visitors stopped by the Backlund field to operate, learn, and socialize.
- **Stations Deployed:** 12 member and club-provided stations were up and running across the property.
- **Modes Covered:** A great mix of operational styles, spanning SSB Phone, Digital, and CW.
- **Hamburgers & Hot Dogs:** Thanks Mike & Jan for cooking the food, it was great to sit and enjoy the food sitting in your beautiful backyard!

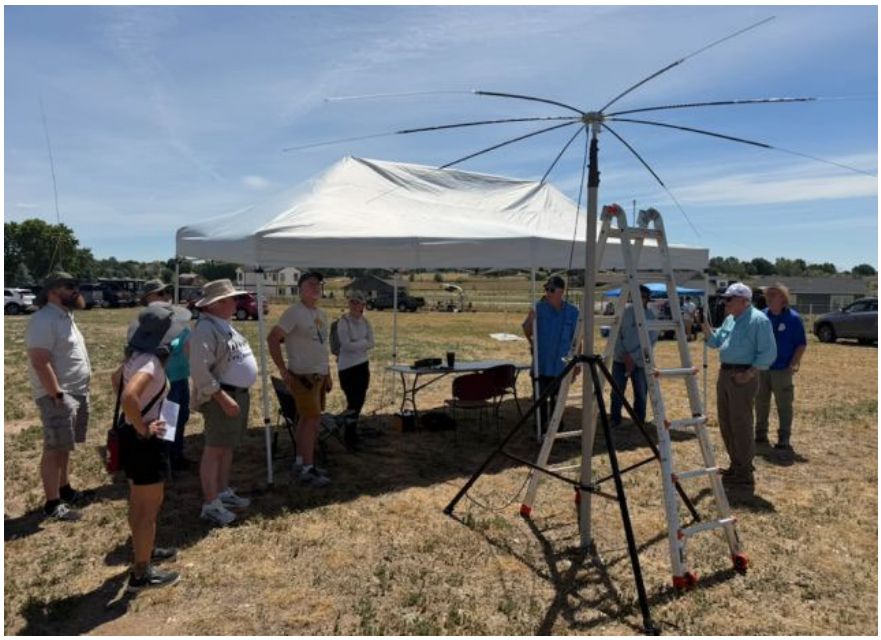


6 of the 12 stations are in this shot

Morning Education: Hands-On Gear Breakdowns

We kicked things off Saturday morning two hours early with focused, 30-minute educational tracks. Thanks to Pete Robbins – WØRCR, Joe Hawley KDØTYU, Greg Ella NØEMP, Jim Gale KFØLAN and Dick Doutt KEØME, for sharing their knowledge about the following radios and equipment. Newcomers learned the real-world pros, cons, and home-station potential of four distinct setups that run from $500 to $6000:

Radios	Antennas
• ICOM 7300 • Elecraft K4 • Yaesu 450D • Xiegu G90	• Off Center-fed Dipole • ¼ Wave Faraday Ground Plane • Octopus • Chameleon • Wolf River Coil



Jim Gale KF0LAN talking about the Octopus Antenna



Joe Hawley KD0TYU with the Elecraft K4

A huge thank you to everyone who shared their knowledge and gear to demystify HF operating for our newer hams!



Dick Doutt KEØME talking about his ¼ wave with a Faraday ground plane



Greg Ella NØEMP demonstrating the Chameleon Antenna

New Hams on the Air

While we may not have broken world records for raw contact volume this year, the true success of the weekend happened in the operating chairs. This Field Day was all about mentorship. We had over 8 newly licensed hams at Field Day. **Every single new member who attended got hands-on time with a radio and made successful HF contacts.** For several participants, this was their first time ever touching an HF rig. Helping them break through the noise and make those first connections was the ultimate highlight of the weekend.





Members & Newcomers getting on the air!



Pete Borely KFØBTB helping a newly licensed Ham get on the air



Joe Foreman KFØTUV helping a newly licensed Ham get on the air.

ARRL Submission & Scores

Preliminary Total Score: 886

Bonus Points:

Bonus	Points Status
100% emergency power	500
Educational activity	100
Social media	100
Entry submitted via web	50
Total bonus points	**750**

Band/Mode QSO Breakdown:

	CW		Digital		Phone	
Band	QSOs	Pwr(W)	QSOs	Pwr(W)	QSOs	Pwr(W)
160m						
80m						
40m					16	100
20m	17	100			13	100
15m					4	100
10m					1	100

Looking Ahead to Field Day 2027!

An event like this doesn't happen without an incredible team. Again, massive thank you to our wonderful hosts Mike & Jan Backlund for letting us use their field, our top-notch social media and organizing team, the cooks, and everyone who pitched in to transport gear and string up antennas in the heat. Also, thank you to Ralph Towers KAØCET for the use of his camper for our bathroom, this saved the club more than $500!

We are already taking notes and planning for **Field Day 2027**! We are looking at implementing some of the great feedback we received, including setting up a dedicated GOTA (Get-On-The-Air) station with a directional antenna, holding pre-event logging classes, and tightening up our band/mode coordination. Appreciate everyone's participation!

Contributed by Randy Barnett KFØRUW

Upcoming Ham Radio Events

Courage Classic Bicycle Tour: Jul 18-19, 2026, Copper Mountain, CO. More info here. Contact Christian WØCDN.

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

Fall Equinox Marathon: Sep 20, 2026, Poudre Canyon, CO. More info here. Contact Marty KØMLG

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

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 Jul 22, 2026) Perkins Restaurant, 2222 W Eisenhower Blvd, Loveland, CO

From the Editor
Ann Donoghue KØARD

Field Day was a great day – crazy hot, and so well organized!

There are still lots of fun Ham Radio things to do this summer, even in the heat!

Hope your summer is filled with those fun things!
Send me a story and photos!