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QST

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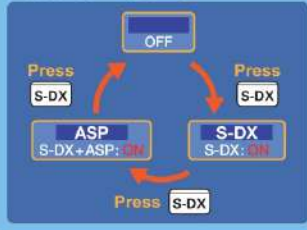

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Assistant Production Supervisor

Matt Ali
Layout & Production Specialist

Maty Weinberg, KB1EIB
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David Pingree, N1NAS
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Janet Rocco, W1JLR
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Bob Inderbitzen, NQ1R
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Steve Ewald, WV1X
Field Organization Supervisor

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Our Cover
Our annual EmComm issue focuses on the service aspect of amateur radio, including the training that's necessary in order for hams to be effective, productive partners during community events, disasters, and emergencies. This issue presents "A Case for Standardizing EmComm Training" as well as the lessons a New Jersey group learned from their 2024 SET. You'll also see the results of training in action — "Supporting the Lone Rock Fire Response" details an Oregon group's support of a FEMA response. [Pete Harris, KE6ZIW, photo]

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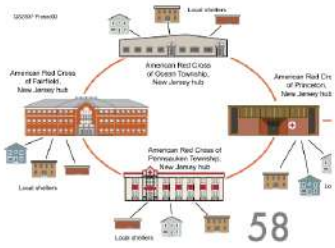

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David A. Minster, NA2AA, ARRL Chief Executive Officer, na2aa@arrl.org

Second Century

Personal Preparedness

An area of amateur radio that is, by definition, an important element to the very existence of the service is emergency communications. I routinely remind hams to go to FCC Part 97, not just to know the rules and regulations, but to understand the why of amateur radio. We do not enjoy access to such vast spectrum privileges without giving something in return. And part of what we give back is "value...to the public... particularly with respect to providing emergency communications," according to Part 97.

ARRL operates the organization known as the Amateur Radio Emergency Service®, or ARES®. This is an effort to fulfill the mission set forth by the FCC in Part 97.1 by ensuring that there is a path for appropriate training, mentoring, exercises and practice, and reporting and analysis of overall preparedness. ARES is a great way to get involved in an organized program for emergency communications, but it is not the only one. SAFECOM has a wonderful set of resources that define the positions that require AUXCOMM training and how they fit into government responses to emergency situations. The Hurricane Watch Net provides another organized and trained group of amateurs who have the opportunity to assist the National Hurricane Center from hurricane-affected areas.

It is interesting, though, that the big story from last year was about a single radio amateur on a local repeater in Asheville, North Carolina, running an impromptu net collecting and passing vital information in the aftermath of a very unexpected disaster caused by Hurricane Helene. Although North Carolina is a very AUXCOMM-forward state, news stories did not emerge about trained first responders and AUXCOMM communicators. What did emerge were the stories of a volunteer who took on the task himself and ran with it. Does that tell the whole story? Of course not. But here's the big question: Could *you* have been that guy on the news?

Taking on the task of personal preparedness is a big deal. It is not simply buying equipment and keeping batteries charged. It is self-training on how the equipment works. It is creating operational checklists that you go over and over, once a week or more, to check into nets, pass messages on Winlink, ensure that APRS is working properly, and check on the effectiveness of your antennas as well as ensure that the assumptions you've made on *your* personal plan are still valid. Has something changed? Respond by updating your plan and checklist. When the time comes, whatever it is, and however much or little notice you have, your muscle memory will kick in so you're not trying to figure things out from scratch. None of this requires you to be a part of a large local organization, although with this planning and these skills, you'd certainly be taken seriously by the powers that be.

A member recently said to me, "G M aRen't uS" — a shot at the GMRS community. Are we making the very same mistake we made 50 years ago when millions of Americans were on HF with CB radio? Diminishing or belittling the people who get utility from their GMRS radios is a big mistake. The expression goes: All emergencies are local. When you're looking for information in an affected area, you want input from anyone and everyone you can connect with. I would encourage you to know two things: GMRS is about utility, not hobby. And GMRS users will likely fire up their radios during an event and could provide critical information to you in your emergency response. I encourage you to get a GMRS license and radio(s) and be that point of interoperability in your local community.

FEMA talks about being a "resilient citizen." Be radio active! Get yourself to a high level of personal preparedness. Be a connector! Look at all locals, including GMRS users, to make a robust community of emergency communications. Have other ideas, or you're already a pro at this? Get involved with ARES, and we'll be looking for your field report after the next event.

David A. Minster, NA2AA
Chief Executive Officer

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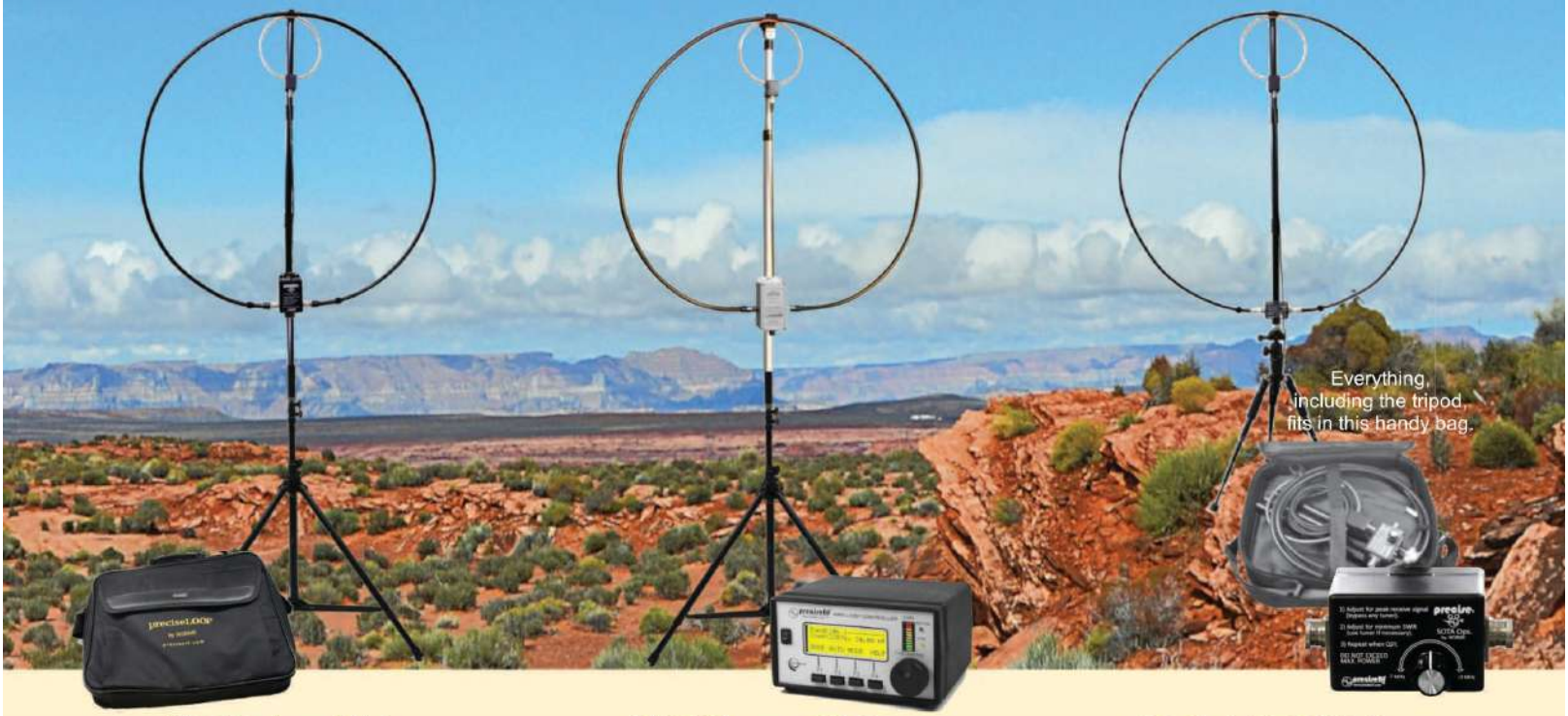

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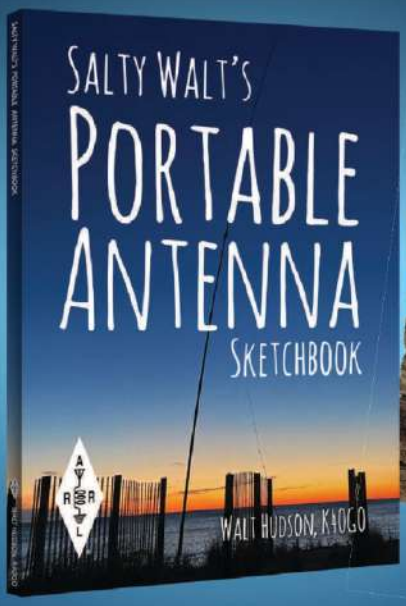

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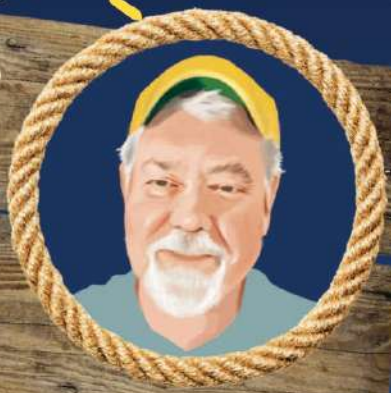

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Member Spotlight

Rex Vokey, KE6MT

Introduction to Electronics

Rex Vokey, KE6MT, is a web developer, a trail runner, a ham, and the W6 coordinator for Summits on the Air (SOTA). He grew up with and around electronics in his father's Seattle store called Video Tech Services. "Lots of childhood memories there," he recalled.

One memorable electronics experience came in the form of a Science Fair 150 in 1 Project Kit from RadioShack. On the 150 in ONE board, he wired together a diode, capacitor, resistor, and antenna, and heard distant stations through the speaker. He recalled, "It wasn't a transceiver or anything, just a receiver, but it really stuck with me, just how cool radio is."

It wasn't until 2015 that Rex's radio fascination led him to ham radio. He was in Yosemite, running a trail from the top of the valley to the bottom. He carried a Family Radio Service (FRS) radio with him so he could keep in contact with his family, who were taking a road down the mountain in the car. Rain set in and didn't let up. The little FRS radio he had couldn't get through to his family. "So, I was trying to figure out where the heck they were," he recalled. After he found them and made it home, he started looking for a new radio, and he "ran across this Baofeng thing, and I was like, oh, yeah, that requires a ham license, and I have to learn Morse code for that." Later, he discovered the code requirement had gone away. "So, I jumped all over that," he said.

HF and SOTA

His first ham radio was, in fact, a Baofeng, but he quickly upgraded to a Yaesu handheld transceiver. At that point, HF seemed out of reach. He juggled living in the Bay Area with two small children and an extremely limited "fun budget." But in 2016 somebody got extremely grumpy with him on a repeater, which spurred him to really dive into HF. About the same time, he discovered SOTA, and he thought, "Oh my goodness, I love being outdoors, hiking, running, summiting, mountaineering. And you get up onto a summit, set up your radio in a perfectly RF-quiet environment, and make contacts." His initial SOTA activations relied on a handheld, but he eventually transitioned to a Yaesu FT-817 (which, for 5 W on SSB, is a lot of radio to be lugging up a mountain!). Even that extra transceiver weight couldn't hold him back though, and he continued to explore SOTA.

That time and effort culminated in him becoming the SOTA W6 Association Manager. He was hesitant at first, but after learning about the role and the time commitment, he decided he could hack it. Mostly, he fields questions about SOTA and connects new participants with more experienced operators.

These days, he has transitioned away from the FT-817 to an Elecraft KX2 while SOTAing. He hoists a random-wire antenna on a lightweight, telescoping fishing pole and matches it with the KX2's built-in antenna tuner. His home station consists of a KX3 and a 40-meter

horizontal loop at about 15 feet, which he uses to chase SOTA and POTA operators.

SOTA Adventures

SOTA has led Rex to bushwhacking, poison ivy, and mountain biking on summits, but probably his most harrowing adventure involves mountaintop snow camping. After hiking up a mountain, he and his companions set up a makeshift tarp shelter and tent. Snow began to fall, a little at first, and then faster, until thunder cracked in that way it does when it's nearby — not the distant rumble of shockwaves combining and canceling as they roll over miles, but the concussion of hundreds of millions of volts ionizing nearby atmosphere. After one near miss, Rex and his companions collapsed the tarp shelter, threw all their stuff into the tent, and descended as quickly as possible. Needless to say, Rex didn't make many contacts on that hike. His trusty random wire would've been more liability than lifeline!

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1-860-594-0200, or 1-888-277-5289 (toll-free US only)
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Officers

Founding President 1914-1936
Hiram Percy Maxim, W1AW

President
Rick Roderick, K5UR*
P.O. Box 444, Vilonia, AR 72173
501-988-2527; **k5ur@arrl.org**

First Vice President
Kristen McIntyre, K6WX*
900 Golden Wheel Park Dr., #85
San Jose, CA 95112
510-703-4942; **k6wx@arrl.org**

Second Vice President
Mike Ritz, W7VO
33643 Burma Rd.
Scappoose, OR 97056
503-987-1269; **w7vo@arrl.org**

International Affairs Vice President
Rod Stafford, W6ROD
5155 Shadow Est.
San Jose, CA 95135
408-238-4671; **w6rod@arrl.org**

Chief Executive Officer and Secretary
David A. Minster, NA2AA*
225 Main St.
Newington, CT 06111
860-594-0404; **dminster@arrl.org**

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Atlantic Division

www.atldiv.org
Robert B. Famiglio, K3RF
P.O. Box 9, Media, PA 19063
610-359-7300; **k3rf@arrl.org**

Vice Director: Vacant

Central Division

www.central.arrl.org
Brent Walls, N9BA
2151 E. Bomar Ln., Greenfield, IN 46140
317-557-7224; **n9ba@arrl.org**

Vice Director: **Joshua Long, W9HT**
8725 Edwardsberg Pl., New Haven, IN 46774
260-749-9851; **w9ht@arrl.org**

Dakota Division

www.arrldakota.org
Bill Lippert, ACØW*
2013 6th Ave. SE, Austin, MN 55912
507-993-9181; **ac0w@arrl.org**

Vice Director: **Lynn Nelson, WØND**
3204 Willow Ln. SE, Minot, ND 58701
701-833-1000; **w0nd@arrl.org**

Delta Division

www.arrldelta.org
David A. Norris, K5UZ
1200 Becky Ln., Redfield, AR 72132
870-613-1606; **k5uz@arrl.org**

Vice Director: **Ed B. Hudgens, WB4RHQ**
1441 Wexford Downs Ln., Nashville, TN 37211
615-630-2753; **wb4rhq@arrl.org**

Great Lakes Division

www.arrl-greatlakes.org
Scott Yonally, N8SY*
258 Valley Hi Dr., Lexington, OH 44904
419-512-4445; **n8sy@arrl.org**

Vice Director: **Roy Hook, W8REH**
6611 Steitz Rd., Powell, OH 43065
w8reh@arrl.org

Hudson Division

www.hudson.arrl.org
Ed Wilson, N2XDD
P.O. Box 483, Shirley, NY 11967
631-484-8826; **n2xdd@arrl.org**

Vice Director: **David Galletly, KM2O**
540 Wemple Rd., Glenmont, NY 12077
518-421-8324; **km2o@arrl.org**

Midwest Division

www.arrlmidwest.org
Art Zygielbaum, KØAIZ*
6601 Pinecrest Dr., Lincoln, NE 68516
402-421-0840; **k0aiz@arrl.org**

Vice Director: **Dave Propper, K2DP**
747 Old Bonhomme Rd., University City, MO
63132, 314-225-5167; **k2dp@arrl.org**

How to Contact ARRL Staff

To send an email to any ARRL Headquarters staff member, put his or her call sign (or first initial and last name) in front of **@arrl.org**. For example, to send to Hiram Maxim, First President of ARRL, use **w1aw@arrl.org** or **hmaxim@arrl.org**.

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New England Division

https://nediv.arrl.org
Tom Frenaye, K1KI
P.O. Box J, West Suffield, CT 06093
860-597-4539; **k1ki@arrl.org**

Vice Director: **Phillip E. Temples, K9HI**
125 Coolidge Ave. #803
Watertown, MA 02472-2875
617-331-0183; **k9hi@arrl.org**

Northwestern Division

www.arrlnwdiv.org
Mark J. Tharp, KB7HDX
P.O. Box 2222, Yakima, WA 98907
509-952-5764; **kb7hdx@arrl.org**

Vice Director: **Michael A. Sterba, KG7HQ**
212 Laurel Dr., Sedro Woolley, WA 98284
360-708-2757; **kg7hq@arrl.org**

Pacific Division

www.pacific.arrl.org
Anthony Marcin, W7XM
6836 Boulder Canyon St., North Las Vegas, NV
89084, 702-984-9589; **w7xm@arrl.org**

Vice Director: **John Litz, NZ6Q**
1434 Douglas Rd., Stockton, CA 95207
209-687-0774; **nz6q@arrl.org**

Roanoke Division

www.arrl-roanoke.com
Dr. James Boehner, N2ZZ*
525 Barnwell Ave. NW, Aiken, SC 29801-3939
803-343-9040; **n2zz@arrl.org**

Vice Director: **Bill Morine, N2COP**
101 Windlass Dr., Wilmington, NC 28409
910-452-1770; **n2cop@arrl.org**

Rocky Mountain Division

www.rockymountaindivision.org
Jeff Ryan, KØRM*
9975 Wadsworth Pkwy. K2-275
Westminster, CO 80021
303-432-2886; **k0rm@arrl.org**

Vice Director: **Dan Grady, N2SRK**
8706 S. Buchanan Way, Aurora, CO 80016
720-236-7397; **n2srk@arrl.org**

Southeastern Division

www.facebook.com/ARRLSoutheasternDivision
Mickey Baker, N4MB
14764 Black Bear Rd., West Palm Beach, FL
33418, 561-320-2775; **n4mb@arrl.org**

Vice Director: **Andrew Milluzzi, KK4LWR**
440-829-1187; **kk4lwr@arrl.org**

Southwestern Division

www.kkn.net/n6aa
Richard J. Norton, N6AA
21290 West Hillside Dr., Topanga, CA 90290
310-455-1138; **n6aa@arrl.org**

Vice Director: **Edward Stearns, AA7A**
7038 E. Aster Dr., Scottsdale, AZ 85254
480-332-8255; **aa7a@arrl.org**

West Gulf Division

www.westgulfdivision.org
John Robert Stratton, N5AUS
P.O. Box 2232, Austin, TX 78768-2232
512-445-6262; **n5aus@n5aus.com**

Vice Director: **Lee H. Cooper, W5LHC**
2507 Autrey Dr., Leander, TX 78641
512-658-3910; **w5lhc@arrl.org**

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Atlantic Division DE, EPA, MDC, NNY, SNJ, WNY, WPA

Delaware: Steven Keller, KC3DSO, 803 Meadow Brook Ln., Milford, DE 19963-3000 240-515-0620; **kc3dso@arrl.org**

Eastern Pennsylvania: Bob Wilson, W3BIG, 2223 West Helms Manor, Upper Chichester, PA 19061-3325; 484-836-9367; **w3big@arrl.org**

Maryland-DC: Chris Van Winkle, AB3WG, 24 Tattersaul Ct., Reisterstown, MD 21136-2431; 240-755-4257; **ab3wg@arrl.org**

Northern New York: Rocco Conte, WU2M, 152 W. Bush Rd., Gloversville, NY 12078-6405; 518-848-9028; **wu2m@arrl.org**

Southern New Jersey: Ron Fish, KX1W, 29 S. Canary Way, Galloway, NJ 08205-6208; 845-988-6705; **kx1w@arrl.org**

Western New York: Scott Bauer, W2LC, 1964 Connors Rd., Baldwinsville, NY 13027-9743; 315-430-6368; **w2lc@arrl.org**

Western Pennsylvania: Joe Shupienis, W3BC, P.O. Box 73, Falls Creek, PA 15840-0322; 814-771-3804; **w3bc@arrl.org**

Central Division IL, IN, WI

Illinois: Thomas Beebe, W9RY, 3540 Market Rd., Marion, IL 62959-8940 618-534-6282; **w9ry@arrl.org**

Indiana: Bob Burns, AK9R, P.O. Box 808, Brownsburg, IN 46112 317-520-1188; **ak9r@arrl.org**

Wisconsin: Jason Spetz, KC9FXE, E5910 490th Ave., Menomonie, WI 54751-5644 715-231-7722; **kc9fxe@arrl.org**

Dakota Division MN, ND, SD

Minnesota: Bill Mitchell, AEØEE, 7412 Colfax Ave. S., Richfield, MN 55423 510-529-5658; **ae0ee@arrl.org**

North Dakota: Ralph Fettig, NØRDF, 6650 County Rd. 12 W., Minot, ND 58701-3003 701-822-3467; **n0rdf@arrl.org**

South Dakota: Chris Stallkamp, KIØD, P.O. Box 271, Selby, SD 57472-0271 605-848-3929; **ki0d@arrl.org**

Delta Division AR, LA, MS, TN

Arkansas: James D. Ferguson, Jr., N5LKE, 1500 Lauren Dr., Searcy, AR 72143-8477 501-593-5695; **n5lke@arrl.org**

Louisiana: Houston Polson, N5YS, 309 Arkansas St., Winnfield, LA 71483 318-209-8843; **n5ys@arrl.org**

Mississippi: Malcolm Keown, W5XX, 64 Lake Circle Dr., Vicksburg, MS 39180 601-636-0827; **w5xx@arrl.org**

Tennessee: David Thomas, KM4NYI, 205 Linford Rd., Knoxville, TN 37920 865-654-5489; **km4nyi@arrl.org**

Great Lakes Division KY, MI, OH

Kentucky: Alan Morgan, KY1O, 1711 Willisburg Rd., Lawrenceburg, KY 40342-9555 859-753-5092; **ky1o@arrl.org**

Michigan: Larry Camp, WB8R, 71 Oakdale Ln., Coldwater, MI 49036-1200 517-617-4883; **wb8r@arrl.org**

Ohio: Tom Sly, WB8LCD, 1480 Lake Martin Dr., Kent, OH 44240-6260 330-554-4650; **wb8lcd@arrl.org**

Hudson Division ENY, NLI, NNJ

Eastern New York: John K. Fritze, Jr., K2QY, 4 Normanskill Blvd., Delmar, NY 12054-1335; 401-261-4996; **k2qy@arrl.org**

NYC-Long Island: Jim Mezey, W2KFV, 38 Appletree Ln., Carle Place, NY 11514-1336 516-315-8608; **w2kfv@arrl.org**

Northern New Jersey: Nomar Vizcarrondo, NP4H, P.O. Box 245, Tenefly, NJ 07670-0245 917-443-2664; **np4h@arrl.org**

Midwest Division IA, KS, MO, NE

Iowa: Barry Buelow, WØIY, 4109 Cedar Heights Dr., Center Point, IA 52213-9206 319-651-4985; **w0iy@arrl.org**

Kansas: Ronald D. Cowan, KBØDTI, P.O. Box 36, La Cygne, KS 66040 913-757-4456; **kb0dti@arrl.org**

Missouri: Cecil Higgins, ACØHA, 27995 County Rd. 220, Hermitage, MO 65668-8493 417-493-8208; **ac0ha@arrl.org**

Nebraska: Matthew N. Anderson, KAØBOJ, 14300 NW 98th St., Raymond, NE 68428-4254; 402-480-5515; **ka0boj@arrl.org**

New England Division CT, EMA, ME, NH, RI, VT, WMA

Connecticut: Douglas Sharafanowich, WA1SFH, 168 Housatonic Dr., Milford, CT 06460-4936; 203-494-3887; **wa1sfh@arrl.org**

Eastern Massachusetts: Jon McCombie, N1ILZ, 75 Northwest St., Eastham, MA 02642 508-246-4982; **n1ilz@arrl.org**

Maine: Philip Duggan, N1EP, 195 Kansas Rd., Milbridge, ME 04658-3120 207-598-5397; **n1ep@arrl.org**

New Hampshire: Peter Stohrer, W1FEA, 9 Gladstone St., Concord, NH 03301-3130 603-345-1470; **w1fea@arrl.org**

Rhode Island: Nancy Austin, KC1NEK, P.O. Box 4941, Middletown, RI 02842-0941 401-935-3070; **kc1nek@arrl.org**

Vermont: Paul N. Gayet, AA1SU, 11 Cherry St., Essex Junction, VT 05452 802-878-2215; **aa1su@arrl.org**

Western Massachusetts: Raymond Lajoie, AA1SE, 245 Leominster Rd., Lunenburg, MA 01462-2031; 978-549-5507; **aa1se@arrl.org**

Northwestern Division AK, EWA, ID, MT, OR, WWA

Alaska: David Stevens, KL7EB, 8521 Golden St., Apt. 4, Anchorage, AK 99502 907-242-6483; **kl7eb@arrl.org**

Eastern Washington: Jo Whitney, KA7LJQ, P.O. Box 2222, Yakima, WA 98907 509-952-5765; **ka7ljq@arrl.org**

Idaho: Dan Marler, K7REX, 4620 Highway 30 S., New Plymouth, ID 83655-5309 208-914-8939; **k7rex@arrl.org**

Montana: Kevin Kerr, W1KGK, P.O. Box 69, Plains, MT 59859-0069 406-242-0109; **w1kgk@arrl.org**

Oregon: Scott Rosenfeld, N7JI, 3662 Vine Maple St., Eugene, OR 97405-4473 541-684-9970; **n7ji@arrl.org**

Western Washington: Bob Purdom, AD7LJ, P.O. Box 65171, University Place, WA 98464-1171; 253-691-2388; **ad7lj@arrl.org**

Pacific Division EB, NV, PAC, SCV, SF, SJV, SV

East Bay: Mike Patterson, N6JGA, P.O. Box 30627, Walnut Creek, CA 94598 925-200-8300; **n6jga@arrl.org**

Nevada: Craig McVeay, NØCSM, 3820 Twilight Ave., Pahrump, NV 89048 305-712-0254; **n0csm@arrl.org**

Pacific: Alan Maenchen, AD6E, 2164 Kamaile St., Wailuku, HI 96793-5458 408-382-1008; **ad6e@arrl.org**

Sacramento Valley: Dr. Carol Milazzo, KP4MD, P.O. Box 665, Citrus Heights, CA 95611-0665; 916-259-3221; **kp4md@arrl.org**

San Francisco: Dr. Antonis Papatsaras, AA6PP, 48 Bayo Vista Ave., Larkspur, CA 94939-1006; 415-861-5053; **aa6pp@arrl.org**

San Joaquin Valley: Steven Hendricks, KK6JTB, P.O. Box 630, Inyokern, CA 93527-0630; 760-977-2590; **kk6jtb@arrl.org**

Santa Clara Valley: James Armstrong, NV6W, 2048 Paseo Del Sol, San Jose, CA 95124-2048; 408-679-1680; **nv6w@arrl.org**

Roanoke Division NC, SC, VA, WV

North Carolina: Marvin K. Hoffman, WA4NC, P.O. Box 2208, Boone, NC 28607 828-964-6626; **wa4nc@arrl.org**

South Carolina: Matthew Crook, W1MRC, 220 Star Hill Ln., Lexington, SC 29072-6948; 803-386-1069; **w1mrc@arrl.org**

Virginia: Jack Smith, KE4LWT, 515 New Life Dr., Ruckersville, VA 22968-3045 662-523-0000; **ke4lwt@arrl.org**

West Virginia: Dan Ringer, K8WV, 18 W. Front St., Morgantown, WV 26501-4507 304-292-1999; **k8wv@arrl.org**

Rocky Mountain Division CO, NM, UT, WY

Colorado: Amanda Alden, K1DDN, 230 Glenmoor Rd., Canon City, CO 81212-7705 719-735-8444; **k1ddn@arrl.org**

New Mexico: Bill Mader, K8TE, 4701 Sombrerete Rd. SE, Rio Rancho, NM 87124 505-250-8570; **k8te@arrl.org**

Utah: Brett Pruitt, K7BDP, 239 S. Valley View Dr., Hurricane, UT 84737-4413 435-922-1114; **k7bdp@arrl.org**

Wyoming: Garth Crowe, Sr., WY7GC, 2342 Sagewood Ave., Casper, WY 82601-5018 307-689-1340; **wy7gc@arrl.org**

Southeastern Division AL, GA, NFL, PR, SFL, VI, WCF

Alabama: Dennis Littleton, K4DL, 2230 Bishop Rdg., West Blocton, AL 35184-4246 205-718-4410; **k4dl@arrl.org**

Georgia: Hank Blackwood, K4HYJ, 406 Dawnville Rd. NE, Dalton, GA 30721 706-529-5647; **k4hyj@arrl.org**

Northern Florida: Scott Roberts, KK4ECR, 2361 Oak Hammock Ln., Orange Park, FL 32065; 904-759-7812; **kk4ecr@arrl.org**

Puerto Rico: Carmen N. Greene Rodriguez, KP4QVQ, Parc. San Romualdo 52 Calle H, Hormigueros, PR 00660-9735; 787-246-5634; **kp4qvq@arrl.org**

Southern Florida: Barry M. Porter, KB1PA, 14555 Sims Rd., Apt. 259, Delray Beach, FL 33484; 561-499-8424; **kb1pa@arrl.org**

Virgin Islands: Fred Kleber, K9VV, P.O. Box 24275, Christiansted, VI 00824-0275 **k9vv@arrl.org**

West Central Florida: Michael Douglas, W4MDD, 2527 Apple Blossom Ln., Wauchula, FL 33873; 863-585-1648; **w4mdd@arrl.org**

Southwestern Division AZ, LAX, ORG, SB, SDG

Arizona: Rick Paquette, W7RAP, 1600 W. Sunkist Rd., Tucson, AZ 85755-9561 520-425-6877; **w7rap@arrl.org**

Los Angeles: Diana Feinberg, AI6DF, P.O. Box 4678, Palos Verdes Peninsula, CA 90274-9618; 310-544-2917; **ai6df@arrl.org**

Orange: Bob Turner, W6RHK, P.O. Box 973, Perris, CA 92572 951-236-8975; **w6rhk@arrl.org**

San Diego: Bruce Kripton, AG6X, 5755 Castleton Dr., San Diego, CA 92117-4058 619-813-5505; **ag6x@arrl.org**

Santa Barbara: John Kitchens, NS6X, P.O. Box 178, Somis, CA 93066 805-216-2569; **ns6x@arrl.org**

West Gulf Division NTX, OK, STX, WTX

North Texas: Steven Lott Smith, KG5VK, 125 Contest Ln., Ben Franklin, TX 75415-3830 318-470-9806; **kg5vk@arrl.org**

Oklahoma: Mark Kleine, N5HZR, 2651 84th Ave. SE, Norman, OK 73026 405-410-6756; **n5hzr@arrl.org**

South Texas: Stuart Wolfe, KF5NIX, 408 Cedar Grove Rd., Rockdale, TX 76567 512-660-9954; **kf5nix@arrl.org**

West Texas: David Overton, W5JDO, 2812 W. Shandon Ave., Midland, TX 79705-6101 432-553-5597; **w5jdo@arrl.org**

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Up Front

Stepping Up

John Morelli, W1JGM, shared the many facets of ham radio with his friends, including the process of acquiring one's license. Interest was high, so he approached his club, the Candlewood Amateur Radio Association, about sponsoring a class. A hybrid approach was decided upon, meeting first in person to go over class expectations, distribute materials, and have a question-and-answer session. After several online meetings, they met again for in-person demonstrations and hands-on radio experience. The Northville Amateur Radio Association/Candlewood Amateur Radio Association VE Team administered the exam. The class was a success — nine new Technicians and two new Generals! John thanks the volunteers — John Ahle, W1JMA; Dan Thill, N2DGT, and Vinny Tompkins, N2OHH — who helped make his first training class such a success.

Students taking their license exams. [John Morelli, W1JGM, photo]

Birdies

Hams often refer to spurious signals on their radio as *birdies*. Typically tones or chirps, birdies are unwanted signals caused by radio or nearby oscillators. You can do without these annoying sources of interference.

Dennis Lazar, W4DNN, was surprised that the birdies on his satellite radio signals were evidently caused by an osprey, a real birdie!

[Dennis Lazar, W4DNN, photo]`

[Kosta Kropivny, VA7KL, photo]

Stealth Antenna

Kosta Kropivny's, VA7KL, wife, Elena Terekhova, used a vertical 102-inch whip antenna to grow kiwifruit. Testing showed that the SWR dip shifted down by 150 kHz on the 80-meter band. Elena thought the vine made the antenna more attractive; Kosta noted that the fruit harvest increased.

If you see something ham-related out in the world, take a photo of it and send it to "Up Front" at **upfront@arrl.org**.

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Correspondence

Letters from Our Members

Eye-Catching Equipment

I enjoyed George Misic's, KE8RN, "Classic Radio" article in the May 2025 issue. I'm unfamiliar with Dentron products, but the MLX-Mini QRP concept transceiver really caught my attention. Its color, shape, and control knobs look very modern, except for the S-meter.

I am a retired automotive technician, and to my eyes, that concept transceiver looks good. From my perspective, a device must first perform its functions as designed, be serviceable, and then style can come into the picture, which is quite different from the automotive world, where style grabs your initial interest.

Stephen Kramme, KD6KXT
Novato, California

Club Camaraderie and Remote Operating

I am a member of the Olympia Amateur Radio Society (OARS), NT7H, in Olympia, Washington. OARS is very active in the community, helping with fundraising events like marathons and bike rides, and attending preparedness expos, license classes, monthly test sessions, and so much more.

My wife and I decided to move to a 55+ community apartment complex. I wanted to remain on the air, but could not have any antennas that exceeded the boundaries of my third-floor balcony. Vector network analyzer testing revealed that a small-space antenna would not work. I tried several antenna configurations, and they all failed to produce a usable signal. Packet radio is not an option because all of the local repeaters and packet stations are on the other side of the building. I presented my dilemma to OARS, seeking their advice.

Lee Chambers, KI7SS, offered to let me remotely access his FLEX-6500. So, I downloaded *SmartSDR*, logged into his radio, and was back on the air! Now, I can regularly check in to the Washington State Emergency Net, browse 20, 15, and 10 meters for that rare DX, and participate in contesting and casual ragchews, all thanks to Lee's generosity!

OARS members share problems and step up to help find solutions. If there is a club in your area, join it. If you don't have a local club, start one.

Phil Cornell, W7PLC
Olympia, Washington
Life Member

School Project Generates Interest

I am a geometry/physics teacher at the all-girls Cabrini High School in New Orleans, Louisiana. After my students finished a chapter on similar polygons, scale factors, ratios, and proportionality, they were divided into groups. Each group was given a cubical quad or a Yagi antenna. They were required to measure the reflector, driven, and director elements and compute the scale factor between them.

A satellite was directly southeast of the school at an elevation of 37 degrees, so they tried to hear it while my radios scanned the military satellite band. They were able to hear people in Brazil, though not very well.

My students didn't know this, but a few days earlier, I had gotten permission from the all-boys Archbishop Shaw High School to allow Michael, KJ5CZH, to get on the air to talk to us via the 146.86 repeater. The girls had questions prepared, and I put the student with the question "Where are you located?" first in line. When he said he was at Archbishop Shaw High School, it was pandemonium! A teenage boy was on the other end of the radio! Most of the questions were about ham radio, but at the end, I let them ask whatever they wanted. If the girls wanted to talk to Michael, they would have to get their ham radio licenses. Now, they are showing interest!

Alvin Mahler, III, N5VZH
Raceland, Louisiana

It Never Hurts to Ask

I have an Extra-class license and live in a 55+ community high-rise building. A couple of months ago, I got permission to put a wire up! I have been operating VHF for years and wanted an HF station, so now I have a 66-foot wire, an LDG Electronics RU-9:1 Unun, an LDG Electronics Z-100Plus tuner, an Icom IC-735 transceiver, and a new love for ham radio. So, never say "I live in an apartment; I can't operate HF." Talk to the person in charge, and you might be surprised.

Ted Pinsker, WA3BOJ
Pittsburgh, Pennsylvania

Send your letters to **letters@arrl.org**. We read every letter received, but we can only publish a few each month. We reserve the right to edit your letter for clarity, and to fit the available page space. Letters published in "Correspondence" may also appear in other ARRL media. The publishers of *QST* assume no responsibility for statements made by correspondents.

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W1AW Schedule

PAC	MTN	CENT	EAST	UTC	MON	TUE	WED	THU	FRI
6 AM	7 AM	8 AM	9 AM	1300		FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
7 AM-12^{45} PM	8 AM-1^{45} PM	9 AM-2^{45} PM	10 AM-3^{45} PM	1400-1945	VISITING OPERATOR TIME				
1 PM	2 PM	3 PM	4 PM	2000	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
2 PM	3 PM	4 PM	5 PM	2100	CODE BULLETIN				
3 PM	4 PM	5 PM	6 PM	2200	DIGITAL BULLETIN				
4 PM	5 PM	6 PM	7 PM	2300	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
5 PM	6 PM	7 PM	8 PM	0000	CODE BULLETIN				
6 PM	7 PM	8 PM	9 PM	0100	DIGITAL BULLETIN				
6^{45} PM	7^{45} PM	8^{45} PM	9^{45} PM	0145	VOICE BULLETIN				
7 PM	8 PM	9 PM	10 PM	0200	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
8 PM	9 PM	10 PM	11 PM	0300	CODE BULLETIN				

W1AW's schedule is at the same local time throughout the year. From the second Sunday in March to the first Sunday in November, UTC = Eastern US time + 4 hours. For the rest of the year, UTC = Eastern US time + 5 hours.

♦ Morse code transmissions: Frequencies are 1.8025, 3.5815, 7.0475, 14.0475, 18.0775, 21.0675, 28.0675, 50.350, and 147.555 MHz.

Slow Code = practice sent at 5, 7½, 10, 13, and 15 WPM.

Fast Code = practice sent at 35, 30, 25, 20, 15, 13, and 10 WPM.

Code bulletins are sent at 18 WPM.

For more information, visit us at
www.arrl.org/w1aw

♦ W1AW Qualifying Runs are sent on the same frequencies as the Morse code transmissions. West Coast qualifying runs are transmitted by various West Coast stations on CW frequencies that are normally used by W1AW, in addition to 3590 kHz, at various times. Underline 1 minute of the highest speed you copied, certify that your copy was made without aid, and send it to ARRL for grading. Please include your name, call sign (if any), and complete mailing address. Fees: $10 for a certificate, $7.50 for endorsements.

♦ Digital transmissions: Frequencies are 3.5975, 7.095, 14.095, 18.1025, 21.095, 28.095, 50.350, and 147.555 MHz.

Bulletins are sent using 45.45-baud Baudot, PSK31 in BPSK mode, and MFSK16 on a daily revolving schedule.

Keplerian elements for many amateur satellites will be sent on the regular digital frequencies on Tuesdays and Fridays at 6:30 PM Eastern time using Baudot and PSK31.

♦ Voice transmissions: Frequencies are 1.855, 3.99, 7.29, 14.29, 18.16, 21.39, 28.59, 50.350, and 147.555 MHz. Voice transmissions on 7.290 MHz are in AM double sideband, full carrier.

♦ Notes: On Fridays, UTC, a DX bulletin replaces the regular bulletins. W1AW is open to visitors 10 AM to 3:45 PM Monday through Friday. FCC-licensed amateurs may operate the station during that time. Be sure to bring a reference copy of your current FCC amateur license. In a communication emergency, monitor W1AW for special bulletins as follows: voice on the hour, teleprinter at 15 minutes past the hour, and CW on the half hour.

W1AW code practice and CW/digital/phone bulletin transmission audio is also available real-time via the *EchoLink Conference Server* W1AWBDCT. The conference server runs concurrently with the regularly scheduled station transmissions. The W1AW Qualifying Run texts can also be copied via the EchoLink Conference Server.

During 2025, Headquarters and W1AW are closed on New Year's Day (January 1), Presidents Day (February 17), Memorial Day (May 26), Independence Day (July 4), Labor Day (September 1), Veterans Day (November 11), Thanksgiving and the following day (November 27 and 28), and Christmas and the following day (December 25 and 26).

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Operating *WSPR* QRPpp: It's All About the Noise

Quieting your local interference helps with receiving the weakest signals.

Conrad Trautmann, N2YCH

Weak Signal Propagation Reporter (*WSPR*) is a digital mode within *WSJT-X* (see Figure 1). The data that's generated by the *WSPR* network can be used to check your antenna's performance for transmitting and receiving, and to see what band paths are open at a particular time of day from your location. Recently, I've been using *WSPR* to improve my antenna systems and to help measure the effects of reducing local noise sources.

WSPR sends approximately 2-minute-long QRP digital transmissions containing the originating station's call sign, the Maidenhead grid locator, and the transmit power level being used. Stations typically use anywhere from a few milliwatts to 5 W when sending these signals for QRP (5 to 1 W), QRPp (less than 1 W to 100 mW), and QRPpp (less than 100 mW) operations. *WSJT-X* allows you to select how often you want to send the transmission and which bands to use. There's a schedule in *WSJT-X* that allows band hopping for stations using a multiband antenna to transmit on different bands. When you're not transmitting, it listens for and decodes other transmitting stations and can post those station location spots to the *WSPR* network database.

When it's not transmitting, *WSPR* will receive and post the beacons it hears to **www.wsprnet.org**. Similar to the way **www.pskreporter.info** operates, **www.wsprnet.org** provides maps of where and when the aforementioned station spots are received, the relative received signal strength, the mode, and the frequency being used. After setting up my station to transmit and receive on *WSPR*, and looking on **www.wsprnet.org** at my spots reported by receiving stations the previous day, it was a thrill to see my 250 mW signal reaching all over the world.

Eliminating Local Noise

Tom Paratore, WA2TP, a friend I met in the *WSPR* community, explained how to use these beacons as a tool to improve my station's receiving capabilities. I have a decent HF transceiver, a dipole antenna, and a hexbeam antenna on a rotator — I was making contacts without any problems. However, Tom told me it was all about the noise and recommended using a KiwiSDR, which is a wideband software-defined radio (SDR) that shows the entire spectrum, from 0 Hz to 30 MHz, and, when set up just right, will show

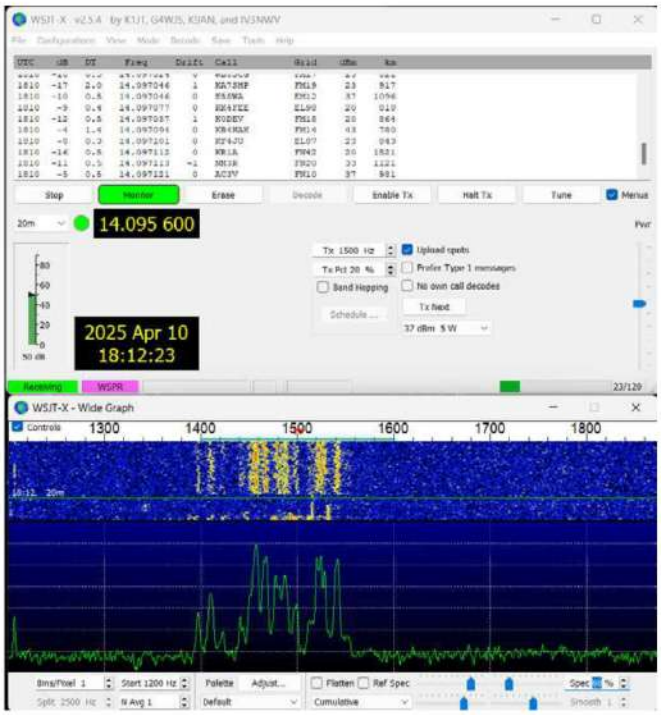

Figure 1 — *WSJT-X* screens in *WSPR* mode.

Figure 2 — Some of the available *WSPR* transmitters, transceivers, and filters.

Top Spotters by spot count distance band duplicates

v4.0.0 Database by Arne, Hosting by Rob, Site by Phil VK7JJ

prefs | advanced search | 24 hours to midnight UTC | 24 hours to now UTC | midnight to now UTC | custom day selector...

•click column headings to sort •click callsign for band summary •click table cells for unique & band spots •click => copy table data to clipboard

=> Displaying data from 2025-01-01 00:00:00 to 2025-01-02 00:00:00 UTC

rank	reporter	locator	#raw	#dupes	#unique	LF	MF	160m	80m	60m	40m	30m	20m	17m	15m	12m	10m	6
	Totals =>	200	3,636,808	564	219,683	173	1,006	1,878	13,684	1,202	45,239	34,865	57,906	20,199	20,474	8,820	14,216	
1	WA2TP	FN30lu	50466	0	2313	2	14	14	120	9	382	330	600	230	252	116	244	
2	N2YCH	FN31jg	45580	0	2050	0	10	11	113	5	313	294	498	208	256	126	215	
3	GM0UDL	IO77vo	32242	0	1996	3	17	35	121	22	316	280	518	223	191	114	156	
4	EA8BFK	IL38bo	24129	0	1995	0	0	6	85	18	256	203	431	224	276	180	316	
5	KX4O	FM18cp	35567	0	1955	0	10	14	96	5	317	276	475	204	232	123	203	
6	KA7OEI-1	DN31uo	51344	0	1949	5	14	11	107	1	315	259	451	211	213	157	202	
7	N2HQI	FN13sa	35861	0	1928	2	8	8	107	4	354	320	417	199	208	120	180	
8	WD4ELG	FM06be	35352	0	1889	0	0	12	105	0	328	290	639	166	196	83	70	
9	W1BW	FN54nh	27397	0	1858	0	0	11	100	5	253	266	493	200	243	153	134	
10	OE9GHV	JN47wk	42319	0	1854	6	25	37	158	32	373	282	443	151	159	83	105	

Figure 3 — *WSPR* Top Spotters for January 1, 2025.

a lot of noise emanating from all sorts of things in the waterfall. The RX-888 MKII is another SDR model that can monitor all of the bands from 2200 to 6 meters, simultaneously. (See Figure 2 for some of the available *WSPR* hardware.)

If you're trying to receive a 250 mW *WSPR* signal transmitting from a beacon in Australia (a VK beacon), the QRM (interference) generated by an after-market, wall-wart switching power supply connected to your cell phone charger a few feet away from your antenna could be loud enough to block out the VK beacon. Your antenna and ability to hear distant signals is only as good as how low (quiet) the local noise is.

With a lot of guidance from experienced folks, I began my hunt for noise. I measured my success of eliminating the noise by my placement on the *WSPR* Top Spotters leaderboard (**https://wspr.rocks/topspotters/topb.html**), which provides a record of how many beacon transmissions you receive, spot, and post by band (it refreshes daily at 0000 UTC). The website allows you to sort beacon reception by distance and received signal strength. As I found and eliminated my local interference sources, my receive sensitivity improved, and I was able to hear more beacons from farther away. When I began in May 2024, I was ranked 62 out of the top 200 *WSPR* receive sites. Now, I regularly place in the top 10 and have even been ranked as high as number two (see Figure 3)!

I could write an entire article on the various noise sources I found, but here are just a few examples.

- I own a Tesla, and it's recommended that the car be attached to the charging cable while parked. I would always leave it plugged in with the onboard ac-to-dc inverter constantly running, even if it wasn't charging, creating a noise level of S5 or more on all of 40 meters. In the KiwiSDR waterfall display in Figure 4, the yellow and orange bars to the left show the local AM broadcast band stations. The bright green bar in the center shows the noise generated after plugging in the Tesla, but not charging it. At 9, 11, 13, and 15 MHz, there are shortwave broadcasters.
- I unplugged the Sonos speaker in my garage because it was creating noise up and down the band.
- A USB-powered LED strip mounted over the top of my Icom IC-7610 transceiver was creating S7 spikes throughout the 20-meter band. I didn't see them when I was running FT8 on my Icom, but I did on the KiwiSDR waterfall.
- I discovered that the air conditioner in a window in my shack was creating a lot of wideband noise on 10 meters. Putting snap-on ferrite cores over the power cord suppressed the noise.

These are just the highlights, as I found more noise (mostly self-inflicted) created by my own equipment. It wasn't until someone showed me the right tools and how to use them that I learned I had a problem and where to look for it. Each time I've discovered even a small noise source and eliminated it, my *WSPR* beacon receive statistics improved. If I can reliably

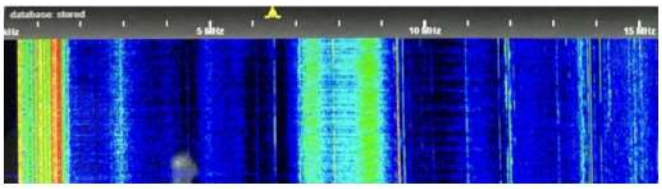

Figure 4 — An SDR waterfall showing the noise from a Tesla charger from 7 to 9 MHz.

pick up those 250 mW VK beacons 16,000 kilometers away, I should be able to hear anything, anywhere, provided the band is open. Having a sensitive, selective radio and a fantastic high-gain antenna alone won't eliminate the S5 inverter noise coming from the car in the garage. But good advice for correctly using the tools needed to chase down and isolate noise in your shack can be a huge help. Check out Clinton Turner's, KA7OEI, blog (**https://ka7oei.blogspot.com**) for more information. As suggested on his blog, I used a tinySA and an active antenna to build a loop to locate my noise sources.

Other Useful Software

I was surprised to learn that there are a number of *WSPR* skimmer software applications that you can connect to an SDR to listen to all (or almost all, depending on your SDR make and model) HF amateur bands simultaneously and post the results to spotter sites. I'm using a Linux application called *WsprDaemon* (**http://wsprdaemon.org**). I typically operate Microsoft, but I learned how to use Linux (with the help of the internet and ChatGPT) and was able to muddle my way through repurposing an old PC to load and run the Linux Ubuntu server. Other applications you can use to do this include the Airspy HF+ server and KiwiSDR's built-in *WSPR* extension, among others. Seeing your reception on more than one band at a time will help you determine what frequencies your antenna is optimized for and give you an at-a-glance look at how the bands are doing at your location that day. For example, I've used the data from my own *WSPR* receivers to determine the best band for operating Parks on the Air® (POTA®). If a band isn't receiving the beacons, then it's unlikely I'll have success making a meaningful amount of contacts. You can also use VOACAP (**www.voacap.com/hf**) or DXMaps (**www.dxmaps.com**) to see this data, but the *WSPR* receiver provides a real-time report on how things are performing at your house or receive site.

Antenna Improvements

Once my local noise sources were addressed, I turned my focus to antenna performance. I experimented with changing the antenna that was feeding my receiver to see how my receive performance compared to other receive stations in my area. The *WSPR* Top Spotter website allows you to sort by grid square, so you can compare your station's reception against others nearby. This is helpful because your geographic location on Earth has a lot to do with how many beacons you can receive.

WsprDaemon allows you to connect more than one SDR at a time, and it uploads only the strongest received signal by band. This functionality allows me to have multiple antennas aimed in different directions that feed two separate SDRs to get north/south and east/west coverage. When you connect two or more SDRs, you can conduct antenna tests against yourself to see which antenna will be better to use on a particular band or in a particular direction. The online reports at **www.wspr.rocks** make it possible to compare the received signals from each SDR.

Final Thoughts

WSPR QRPpp beacons transmitting from all over the world, along with using tools like *WsprDaemon*, KiwiSDR, and RX-888 MKII, have helped me find and eliminate my local QRM and determine what my best antennas are and how to orient them for the best reception. I enjoyed learning the Linux commands and watching *WsprDaemon* post the spots. Finally, it was satisfying to see my station climb up the *WSPR* Top Spotters leaderboard as I made those changes and improvements.

All figures provided by the author.

Conrad Trautmann, N2YCH, became a licensed amateur in 1994. He holds an Amateur Extra-class license and is an accredited ARRL Volunteer Examiner. Conrad spent 44 years as a broadcast engineer and technology manager in commercial radio and recently retired from his job as Chief Technology Officer of Cumulus Media. He's an avid digital mode and POTA operator and is a founding member of **CT-POTA@groups.io**. Conrad can be reached at **n2ych@arrl.net**.

For updates to this article, see the *QST* Feedback page at www.arrl.org/feedback.

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The Power Connector Adapter Hub

When you want to attach a device to a power source, the connectors are often incompatible; WA8QMV has a solution.

The PCAH in use.

Donald "Don" Whiteside, WA8QMV

When I need to make power connections to my devices under test, I often end up with a scattered array of wires with alligator clips connected to power jacks, resistors, test leads, etc. So, I created a a solution that has several different jacks and connectors all in one place. The result is the Power Connector Adapter Hub (PCAH), a simple box featuring multiple power jacks of various types. As seen in the lead photo, the front of the PCAH has two sets of dual banana binding posts and two dc power jacks, which are the standard size of 5.5-millimeter outer diameter (OD) × 2.1-millimeter inner diameter (ID). The rear of the PCAH, shown in Figure 1, has an automotive cigarette lighter jack (with cover), a housing with two pairs of Powerpole® connectors (with cover), and a BNC connector for attaching an oscilloscope, a digital voltmeter (DVM), or other test equipment.

The PCAH permits easy interconnection of devices for temporary testing purposes. For example, you can plug an ac/dc adapter into one of the jacks, a DVM into the BNC connector or banana jacks, and a load resistor into the banana jacks. You can easily insert a dc ammeter in series with the load resistor. Similarly, you can connect a mobile radio or a handheld with a Powerpole or cigarette-type connector to the applicable jack. You can attach a power supply to the banana jacks and a DVM to the BNC to monitor the voltage.

Figure 1 — The rear view of the PCAH.

Build the PCAH As Is

Assembly is straightforward. As you can see in Figure 2, the connectors are all wired in parallel. You can find the needed components at electronic parts supply retailers such as Powerwerx, which has the Powerpole connectors (SKU# PanelPole2) and the cigarette lighter jacks (SKU# PanelCIG). Amazon, Jameco Electronics, Mouser Electronics, and DigiKey can provide dc power jacks, BNC jacks, and banana jacks.

Modify for Your Situation

You can make changes to suit your needs. You may use larger-gauge wire and connectors with higher current ratings. You may also desire different dc connectors, such as a 5.5-millimeter OD × 2.5-millimeter ID connector (used on some portable transceivers), or even a USB-C or USB 3.0 connector. While my dc jacks are wired with positive voltage center pins, some applications may require a negative voltage center pin. If needed, you can add a polarity-reversing switch for a specific jack or reverse-wired connectors. An LED that indicates reverse voltage might be a good addition in such cases. Of course, always double-check your dc polarity before connecting any equipment. You will want to select a case size based on the type and number of connectors you will be using. You may choose either a metal or plastic enclosure, such as those sold by Hammond Manufacturing and other companies. If you use metal, I suggest insulating the connectors from the housing to avoid potential short circuits.

For those who do a lot of bench testing, the PCAH can simplify your dc interconnect setups — it certainly did for me.

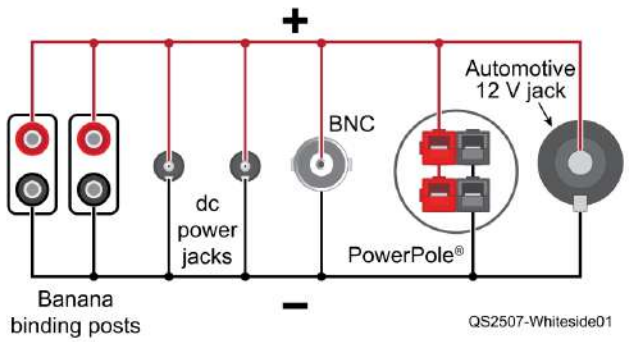

Figure 2 — The PCAH wiring diagram.

All photos provided by the author.

Donald "Don" Whiteside, WA8QMV, licensed since 1965, holds an Amateur Extra-class license and an FCC commercial General Radiotelephone license. He received BBA and MBA degrees from the University of Michigan-Flint, and he possesses various professional certifications. Don is retired from biomedical engineering, healthcare management, and state government careers. He is now an author, podcaster, and the founder of CareerLantern.com, a career-oriented website. When not on the radio or spending time with his family and wife of 50+ years, Don enjoys playing guitar with a blues/rock band at charity events. He may be reached at **wa8qmv@gmail.com**.

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Strays

Third Year of Morse Academy Underway

Morse Academy began its third year in March, welcoming beginners and advanced learners. Morse code classes take place in a dedicated classroom on board the SS *Rotterdam*, anchored in Rotterdam, Netherlands. The former Holland America Line cruise ship is now operated by WestCord Hotels as a hotel with extensive facilities. The classroom is equipped with individual sending and receiving stations for each participant and is fully supported with state-of-the-art audiovisual tools to enhance the learning experience.

Using a simple Morse code key supported by a transmitter and receiver, participants learn to connect with the world without relying on cables, satellites, or computers. The curriculum follows the renowned Koch method, ensuring an effective and structured approach to learning Morse code. Additionally, advanced students have the opportunity to enroll in the Operating Practice Module, allowing them to further hone their skills and operate confidently on the airwaves as experienced CW operators.

To learn more about Morse Academy and to check class schedules, visit **https://morseacademy.nl**.
— *Harm de Haan, PG2GF*

Certificate of Code Proficiency Recipients

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This month, ARRL recognizes merit and progress in Morse code proficiency on the part of the following individuals, who have achieved proficiency at the following rates, in words per minute.

November 2024

Edward K. Metzler, KN9V	10
Paul B. Walp, WB6PIO	10

December 2024

Brian A. Bayani, KT3X	10
Gary L. Carlson, KF5NV	10
Barry G. Fluxe, W4LSV	10
Barry G. Fluxe, W4LSV	15
Franz Willy Odenthal, DK5EQ	15
Kurt Hohler, HB9FMJ	20
Jonathan Leung, VA7JC	20
Lance Martin, VK6DU	20
Gary W. Stephan, AE4GS	20
Kurt Hohler, HB9FMJ	25

January 2025

Ronald M. Bell, KG5CWH	10
Luke A. Sandell, KN4FVR	10
Freddie O. Cruz, AA2QL	15
Forrest Phillips, AEØQH	15
Ron Kinney, KCØZPS	30

February 2025

Michael R. Meadows, KEØFFT	10
James J. Werth, KD1AO	15
Barry G. Fluxe, W4LSV	20
Dominick F. Golino, NR2Z	20
Roger L. Burkhart, N3GE	25

March 2025

Richard L. Eilers, Jr., K4RLE	10
Horacio S. Falciglia, KA8TVY	10
Sherrick A. Slattery, KA6NZB	15
Brian A. Bayani, KT3X	20

April 2025

Scott A. Fronius, N1HQZ	10
Steven M. Johnson, WB4WBO	10
Clifford R. Cantrell, N5GWU	15

Congratulations to all of the recipients.

July 2025 W1AW Qualifying Runs

W1AW, the Hiram Percy Maxim Memorial Station at ARRL Headquarters in Newington, Connecticut, transmits Morse code Qualifying Runs to assist ham radio operators in increasing and perfecting their proficiency in Morse code. Amateur radio operators can earn a Certificate of Code Proficiency or endorsements by listening to W1AW Qualifying Runs.

July Qualifying Runs will be transmitted by W1AW in Newington, Connecticut, at the times shown on 1.8025, 3.5815, 7.0475, 14.0475, 18.0775, 21.0675, 28.0675, 50.350, and 147.555 MHz. The West Coast Qualifying Runs will be transmitted by K9JM on Wednesday, July 23, at 9 PM PDT (0400 UTC on July 24) on 7047.5 kHz. Unless indicated otherwise, sending speeds are from 40 to 10 WPM.

Amateur radio operators who participate in Qualifying Runs may submit proof of 1 minute of the highest speed they have copied in the hope of qualifying for the Certificate of Code Proficiency, or an endorsement to their existing certificate.

Legibly copy at least 1 minute of text by hand, and mail the sheet to: W1AW Qualifying Runs, 225 Main St., Newington, CT USA 06111.

Include $10 (check or money order) if this is a submission for your initial Code Proficiency certificate; $7.50 if you are applying for an endorsement (available for speeds up to 40 WPM). Your text will be checked against the actual transmissions to determine if you have qualified.

Members of the North Fulton (Georgia) Amateur Radio League (**https://nfarl.org**) are offering to subsidize the total cost of a Code Proficiency certificate or endorsement submission for any individual age 21 years and younger, and who reside in either the US or Canada. Participants who wish to make use of this offer should indicate on their Qualifying Run submissions they are age 21 or younger, and certify as such via their signature. Eligible participants are not required to send any fee with their Code Proficiency submissions.

For more information about Qualifying Runs, please visit **www.arrl.org/qualifying-run-schedule**

For information about how to qualify for the Certificate of Code Proficiency, please visit **www.arrl.org/code-proficiency-certificate**.

W1AW Qualifying Run Schedule – July 2025
(All times are in Eastern Daylight Time.)

Monday	Tuesday	Wednesday	Thursday	Friday
	7/8 9 AM – 1300Z 10 – 35 WPM	**7/9** 4 PM – 2000Z 10 – 35 WPM	**7/10** 10 PM – 0200Z **(7/11 – UTC)** 10 – 40 WPM	**7/11** 7 PM – 2300Z 10 – 35 WPM
7/14 7 PM – 2300Z 10 – 40 WPM	**7/15** 4 PM – 2000Z 10 – 35 WPM	**7/16** 9 AM – 1300Z 35 – 10 WPM		
	7/22 10 PM – 0200Z **(7/23 – UTC)** 35 – 10 WPM		**7/24** 9 AM – 1300Z 10 – 35 WPM	**7/25** 4 PM – 2000Z 10 – 40 WPM
7/28 10 PM – 0200Z **(7/29 – UTC)** 10 – 40 WPM		**7/30** 4 PM – 2000Z 35 – 10 WPM	**7/31** 9 AM – 1300Z 35 – 10 WPM	

Product Review

Xiegu X6200 HF and 6-Meter QRP Transceiver

Reviewed by Phil Salas, AD5X
ad5x@arrl.net

I've had the opportunity to review most of the Xiegu products, so I was pleased to be asked to review their latest offering — the X6200.

Overview

The X6200 appears very similar to the X6100, which I reviewed for the July 2022 issue of *QST*. Like the X6100, the X6200 transmits on all 160- to 6-meter amateur bands and has a general-coverage receiver that tunes from 500 kHz to 30 MHz and 50 to 54 MHz. But there are some noticeable differences. The X6200 also receives WFM from 88 to 108 MHz, and air band from 108 to 136 MHz. The X6200 has the BPSK, CW, and RTTY decoders, similar to its predecessor, the X6100, but it also has an FT8 decoder. On transmit, the X6200 puts out 5 W with its attached battery, and 8 W with an external 13.8 V dc power supply (the X6100 put out 10 W with an external power supply). And there are settings in the X6200 that permit the user to change display colors.

The X6200 also has front handles that protect the knobs and display. The X6200 does not have an I/Q output. In my opinion, the biggest improvements are the easily replaced lithium battery pack that just snaps into the back of the X6200, and the front protection handles. The X6200 comes with the snap-on battery, a USB-A/USB-C cable, a hand microphone and cable, a plug-in charger, and a dc power cable. If you purchase it from Radioddity, you will also receive a printed 160-page detailed color operation manual. The full X6200 specifications and ARRL Lab measurements are shown in Table 1.

Interfaces and Controls

The X6200 has easily accessible controls and interfaces. On the left side is the BNC antenna connector and a 5.5 × 2.5-millimeter dc power jack (see Figure 1). On the right side you'll find a microSD memory card slot, USB-C slave and host ports, an RJ-45 microphone jack, 3.5-millimeter three-conductor jacks for an external speaker or headphone and a CW key, and an XPA125B amplifier interface (four-conductor — amp key, ALC, and band data; see Figure 2).

The top-side right three buttons are dual-function (see Figure 3). The normal function, displayed on each button, is enabled by tapping the button. The secondary function, as labeled below the button, is enabled by pressing and holding the button. As an example, to enable the ATU, tap the **ATU** button. For the ATU to tune, press and hold the **ATU** button. Tapping the **FST** button changes the main dial tuning step. The Xiegu-labeled plate on the upper right covers an expansion slot. There is also a bottom expansion slot available. However, nothing is currently being sold for these expansion slots.

The top-side left buttons are all single-function. The **PTT** button is used when operating the X6200 as a handheld with its built-in microphone. The **MODE** and **BAND** switches are self-explanatory.

On the front panel, tapping the volume control cycles its function from AF gain to RF gain to squelch. The six buttons below the **POWER** button bring up different menus. And the six keys below the display are soft

Bottom Line

With up to 8 W of output power, an internal auto tuner, and a snap-on lithium battery, the Xiegu X6200 is a self-contained transceiver in a rugged, compact package that will appeal to portable operators.

Figure 1 — The Xiegu X6200 left side, showing the RF and dc interfaces.

keys whose functions change based on which menu is being displayed. Finally, there is a multi-function knob on the lower left. During normal operation, the outer control ring adjusts transmit power, and the inner control ring can tune the frequency (I'm not sure why one would use this in lieu of the main tuning knob). When any of the detailed menus are selected, the outer knob selects the parameter to be changed, and the inner knob adjusts the parameter.

Power Requirements

The X6200 can be powered from an external 12 – 15 V dc 4 A power supply, or from the attached 7.2 V dc 3200 mAh lithium battery. A 5.5 × 2.5-millimeter dc power cable with bare end wires is supplied for connecting external power. When an external power supply with voltage greater than 11 V dc is connected, the X6200 automatically powers itself from that power supply. The attached battery is charged when the radio is off and either a standard 13.8 V dc power supply or the supplied external charging adapter is connected. You must turn on charging in menu **SETTING 2** to charge the internal battery, though I'm not sure why you would ever want this turned off. The internal X6200 charging circuit automatically stops charging upon charge completion. During charging, the Xiegu indicator light flashes green, and is solid green when charging is complete. I found that I could get about 2 hours of casual operating at 5 W before the X6200 shut down due to a low battery. A fully discharged battery takes about 7 hours to charge.

Figure 2 — The Xiegu X6200 right side, showing the mic, data, key, and audio interfaces.

Firmware Updates

I recommend checking for the latest firmware before you begin using the X6200, as firmware changes seem to happen frequently. Radioddity maintains the latest X6200 firmware on their website, as well as step-by-step instructions for the update procedure. You will need to download *Rufus* 3.10 from **https://filehorse.com/download-rufus/50198**. *Rufus* is a free utility that creates and formats a bootable USB flash drive. I created a firmware folder for this X6200 into which I placed *Rufus* and downloaded the latest firmware from **www.radioddity.com/pages/xiegu-download**. However, if you don't have a microSD card, you will need to purchase one and a microSD-to-USB adapter if your PC doesn't have an integrated reader. To update the X6200, copy the latest firmware to the microSD card using *Rufus*.

With the X6200 powered off, insert the microSD card into its slot on the X6200. When the X6200 is turned on, it will automatically update the operating system. The X6200 will turn off automatically. You must then remove the microSD card, power on the X6200, select the **SYSTEM** menu, and then select **FIRMWARE UPGRADE**. Finally, press the **UPGRADE** soft key. This process took me only about 5 minutes — plus the time waiting for Amazon to deliver my microSD card and USB adapter!

Figure 3 — The Xiegu X6200 top side, showing the mode, band, ATU, and expansion port.

Table 1 — Xiegu X6200 HF Transceiver S/N V5K#V41141, Firmware 1.0.3

Manufacturer's Specifications	Measured in the ARRL Lab
Frequency coverage: Receive: 0.500 – 136 MHz. Transmit: 1.800 – 55.000 MHz (amateur bands only).	Receive and transmit as specified.
Power requirements: 12 – 15 V dc. Receive: 650 mA max. Transmit: 3 A max.	At 13.8 V dc: Receive: 440 mA (max. brightness and volume, no signal). Transmit: 2.9 A (typical) at 8 W RF output. Microphone adds 20 mA to current consumption when connected.
Modes of operation: CW, AM, SSB, synchronized AM (SAM), narrow FM (NFM), wide FM (WFM).	As specified.

Receiver

SSB/CW sensitivity:
MDS: –138 dB.

AM sensitivity: 10 dB S/N, preamp, attenuator, noise blanker, noise reduction off, AGC on:
0.5 – 1.99999 MHz: 10 µV.
2.0 – 30.0000 MHz: 2 µV.
50 – 54.0000 MHz: 2 µV.

FM sensitivity: 10 dB S/N, preamp, attenuator, noise blanker, noise reduction off, AGC on:
28.00 – 30.000 MHz: 0.2 µV.
50.0 – 54.0000 MHz: 0.2 µV.

Blocking gain compression dynamic range:
Not specified.

Reciprocal mixing dynamic range:
Not specified.

Receiver Dynamic Testing

Noise floor (MDS), 500 Hz bandwidth:

	Preamp Off (dBm/µV)	Preamp On (dBm/µV)
3.5 MHz	–131/0.06	–139/0.02
14 MHz	–133/0.05	–140/0.02
50 MHz	–128/0.09	–137/0.03

10 dB (S+N)/N, 1 kHz tone, 30% modulation, 6kHz BW:

	Preamp Off (dBm/µV)	Preamp On (dBm/µV)
1.02 MHz	–94/4.6	–98/2.8
3.88 MHz	–93/4.8	–103/1.6
50.4 MHz	–91/6.2	–102/1.8

12 dB SINAD, 3 kHz deviation, 15 kHz BW:

	Preamp Off (dBm/µV)	Preamp On (dBm/µV)
29 MHz	–96/3.5	–110/0.75
52 MHz	–96/3.5	–105/1.2

500 Hz BW Offset Preamp	20 kHz Off/On (dB)	5/2 kHz Off/On (dB)
3.5 MHz	123/114	123/123
14 MHz	122/115	122/122
50 MHz	121/114	122/119[1]

Preamp Off	20 kHz (dB)	5 kHz (dB)	2 kHz (dB)
3.5 MHz	119	113	110
14 MHz	121	117	113
50 MHz	96	90	87

Two-Tone Intermodulation Distortion (IMD) Testing (500 Hz BW) Using Single External Dither Signal

Band/Preamp	*Spacing*	*Measured IMD Level*	*Measured Input Level*	*IMD DR*
3.5 MHz/Off	20 kHz	–131 dBm	–43 dBm	Up to 88 dB
14 MHz/Off	20 kHz	–133 dBm	–44 dBm	Up to 89 dB
14 MHz/On	20 kHz	–140 dBm	–54 dBm	Up to 86 dB
14 MHz/Off	5 kHz	–133 dBm	–44 dBm	Up to 89 dB
14 MHz/Off	2 kHz	–133 dBm	–44 dBm	Up to 89 dB
50 MHz/Off	20 kHz	–128 dBm	–43 dBm	Up to 85 dB
50 MHz/On	20 kHz	–137 dBm	–42 dBm	95 dB

FM adjacent channel rejection:
Not specified.

FM two-tone third-order IMD dynamic range: Not specified.

Preamp on: 29 MHz, 67 dB[1]; 52 MHz, 63 dB[1].

Preamp On	20 kHz Offset (dB)	10 MHz Offset (dB)
29 MHz	77[1]	91[1]
52 MHz	76[1]	

Spectral display sensitivity: Not specified.

	Preamp Off (dBm)	Preamp On (dBm)
Waterfall	–123	–128

S-meter sensitivity: Not specified.

S9 Signal	Preamp Off (µV)	Preamp On (µV)
14 MHz	39.8	8.4
50 MHz	70.7	10.3

Notch filter: Adjustable notch frequency and depth, off/auto/manual modes. — Up to 42 dB attenuation, AUTO: 69 ms attack time.

DSP noise reduction: Not specified. — Up to 10 dB.

Squelch sensitivity: Not specified. — At threshold, preamp on, FM, 29 MHz, 0.67 µV; 52 MHz, 0.22 µV.

Receive bandwidth: Not specified. — Range at –6 dB points (bandwidth): CW narrow (250 Hz BW): –180 to 66 Hz (246 Hz). SSB wide (2700 Hz BW): 149 to 2847 Hz (2698 Hz). AM (9 kHz BW): 7 to 3977 Hz (7940 Hz).

Receive processing delay time: Not specified. — 32 ms.

Audio output: 0.5 W (4Ω, ≤10% THD). — As specified. THD 2.5% at 1 VRMS.

Transmitter

Power output @ 13.8 V dc: SSB/CW/FM: 8 W; AM: 2.5 W. Internal battery 5 W (± 1 dB); AM: 1.5 W.

Spurious signal and harmonic suppression: ≥50 dB.

Third-order IMD products: Not specified.

Transmitter Dynamic Testing

As specified.

HF: typically, >70 dB; worst case, 28 MHz: –54 dB; 50 MHz: –72 dB. Complies with FCC emissions standards.

@ 8 W PEP	3rd (dBc)	5th (dBc)	7th (dBc)	9th Order (dBc)
3.5 MHz	–26	–38	–51	–57
14 MHz	–26	–38	–51	–66
50 MHz	–23	–52	–56	–66
Worst case (10 meters)	–20	–36	–39	–47
@ 5 W PEP				
14.250 MHz	–28	–48	<–99	<–99

CW keyer speed range: Not specified. — 6 – 60 WPM; iambic mode A&B.

CW keying characteristics: Not specified. — See Figures A and B.

Transmit-receive turnaround time (PTT release to 50% audio output): Not specified. — S-9 signal, AGC fast: SSB: 55 ms. CW, QSK = 100 ms (default): 1550 ms.[2]

Receive-transmit turnaround time: Not specified. — SSB, 27 ms; FM, 29 MHz, 13 ms; 52 MHz, 12 ms.

Transmit phase noise: Not specified. — See Figure C.

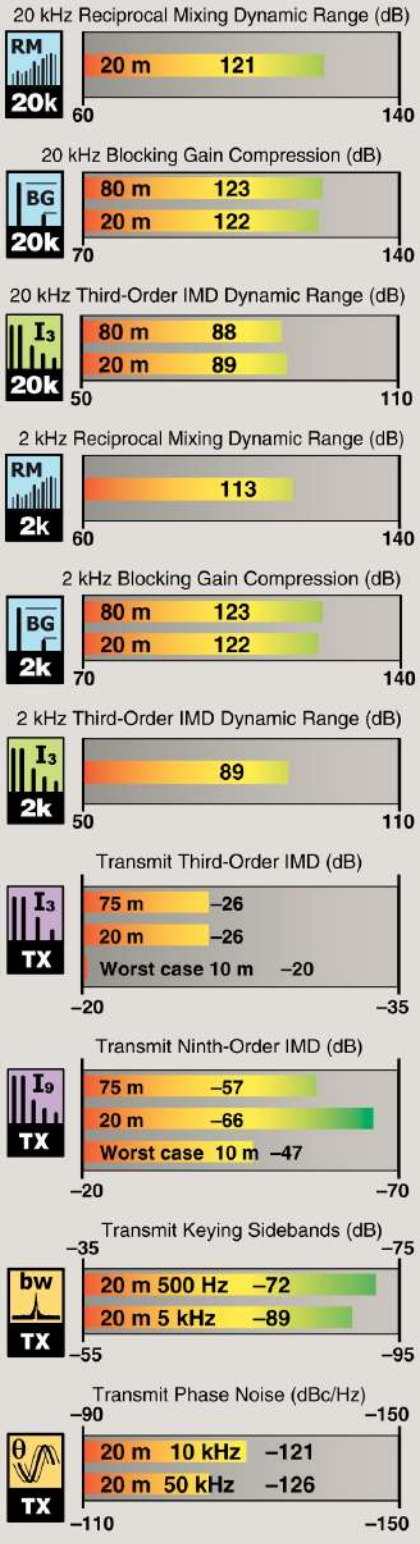
Size (height, width, depth, including protrusions): 3.5 × 8.5 × 2.7 inches.

Weight: 2.1 pounds (1.8 pounds without battery).

[1] Measurement was noise limited at the value shown.

[2] See Lab Notes; AGC fast and slow settings appear to be reversed in CW mode. The time was reduced to 526 ms when AGC was set to slow.

Xiegu X6200 Key Measurements Summary



KEY: QS2507-PR180

Reciever measurements with preamp off.
Transmitter measurements at 8 W RF output.
Bars off the graph indicate values over or under scale.

Table 2 — X6200 ATU Resistive Load and Loss Testing

VSWR/Impedance		*160m*	*80m*	*40m*	*20m*	*10m*	*6m*
8:1/6.25 Ω	Loss	NT	NT	25%	9%	NT	66%
4:1/12.5 Ω	Loss	NT	NT	14%	16%	32%	20%
3:1/16.7 Ω	Loss	NT	19%	14%	16%	22%	22%
2:1/25 Ω	Loss	12%	16%	7%	11%	13%	16%
1:1/50 Ω	Ref	0%	0%	0%	0%	0%	0%
2:1/100 Ω	Loss	12%	12%	14%	21%	25%	26%
3:1/150 Ω	Loss	23%	28%	28%	32%	29%	41%
4:1/200 Ω	Loss	NT	27%	29%	28%	32%	66%
8:1/400 Ω	Loss	NT	NT	26%	29%	35%	76%

Additional Testing

The X6200 auto tuner is specified to match loads from 20 Ω (2.5:1 SWR) to 175 Ω (3.5:1 SWR). This is similar to the 3:1 SWR auto tuner matching range of many 100 W transceivers. I went beyond this range using the setup described in my article published in the March 2021 issue of *QEX*. See the test results in Table 2. Because the auto tuner uses discrete inductance/capacitance (L/C) steps, it won't always achieve a perfect 1:1 SWR. Therefore, the radio output may vary based on the actual load it sees, which can affect the loss measurements. And the radio output cannot be accurately measured into the auto tuner because the auto tuner is integral to the radio. The reference power was set at 5 W with the auto tuner bypassed and transmitting into a 50 Ω load. No tune (NT) in Table 2 means that the tuned SWR was >2:1, as displayed on the X6200 screen.

As you can see in Table 2, the losses are typically around 1 – 1.5 dB within the specified 2.5:1 to 3.5:1 SWR matching specification. For maximum efficiency, it is best to use an antenna that is reasonably well matched.

Next, I checked the S-meter readings against my tinySA Ultra signal generator on 20 and 6 meters. The IARU defines S9 for the HF bands to be a receiver input level of –73 dBm, or 50 µV. For VHF, the recommendation defines S9 to be a receiver input level of –93 dBm, or 5 µV. Though 6 meters is technically a VHF band, the HF recommendation is often used for this band. Finally, the recommendation defines that the difference between each S-unit should be 6 dB. The X6200 test results are shown in Table 3.

As you can see, the X6200 S-meter readings are quite accurate on 20 meters, and off by about 1 S-unit on 6 meters. Also, the S-meter readings drop 1 S-unit per 6 dB just as they should. There is some loss of accuracy around S1.

Table 3 — X6200 Displayed S-Meter Readings vs TinySA Ultra Signal Level

tinySA Output Level	*20m S-Meter*	*6m S-Meter*
–73 dBm (S9)	S9	S8
–85 dBm (S7)	S7	S6
–97 dBm (S5)	S5	S4
–109 dBm (S3)	S3	S2
–121 dBm (S1)	S2	S1

Operating the X6200

On the front panel, tap the **POWER** button to turn on the radio. The X6200 takes around 20 seconds to boot up, so be patient! To

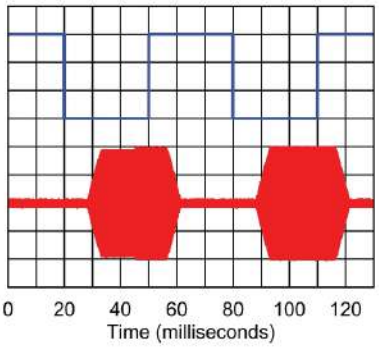


Figure A — CW keying waveform for the Xiegu X6200 showing the first two dits using external keying. Equivalent keying speed is 40 WPM. The upper trace is the key closure; the lower trace is the RF envelope. Horizontal divisions are 20 ms. The transceiver was being operated at 8 W output on the 14 MHz band using QSK set to its default of 100 ms. The first-dit rise time is 4.5 ms; the fall time is 4.3 ms. The second-dit rise time is 4.4 ms; the fall time is 4.3 ms. The first-dit on delay is 10.6 ms; the off delay is 8.9 ms. The second-dit on delay is 10.6 ms; the off delay is 9.0 ms.

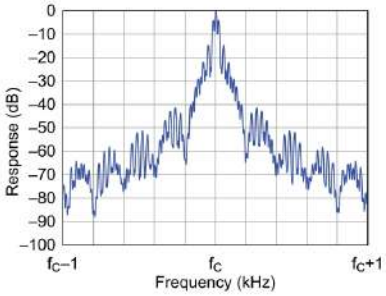


Figure B — The spectral display of the Xiegu X6200 transmitter during keying sideband testing. Equivalent keying speed is 40 WPM using external keying and the default rise-time setting. Spectrum analyzer resolution bandwidth is 10 Hz. The transmitter was being operated at 8 W PEP output on the 14 MHz band, and this plot shows the transmitter output ± 1 kHz from the carrier. The reference level is 0 dBc, and the vertical scale is in dB.

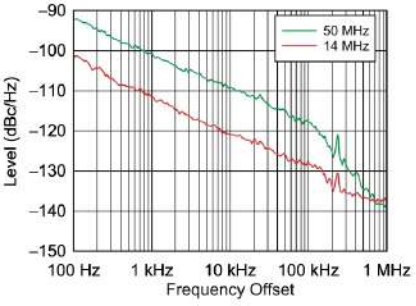


Figure C — The spectral display of the Xiegu X6200 transmitter output during phase noise testing. Power output is 8 W on the 14 MHz band (red trace) and 50 MHz band (green trace). The carrier, off the left edge of the plot, is not shown. This plot shows phase noise 100 Hz to 1 MHz from the carrier. The reference level is –90 dBc/Hz, and the vertical scale is 10 dB per division.

Lab Notes: Xiegu X6200 HF and 6-Meter QRP Transceiver

The ARRL Lab's testing of the Xiegu X6200 uncovered some issues with its AGC operation. The AGC attack time would occasionally be reduced to zero regardless of what it was set to. When operating CW, AGC does not begin to normalize the received signal until after the QSK delay time has expired. With a long QSK delay and AGC set to fast, there was up to a 900 ms period in which the audio increased to a stable level. We also observed that the settings for fast and slow are reversed in CW mode. While operating SSB, the AGC acts as expected.

Overall CW performance of the X6200 was not optimal. On powering on the radio or after changing bands, the RF output in CW mode was limited to less than 1 W until there was a key-down for a period of a few hundred ms. After detecting this long key-down, the radio would then take a few seconds to achieve the RF power it was set to. Switching bands or modes would cause the unit to revert to this behavior every time. While QSK can be set from 0 to 1000 ms, settings below 20 ms produced erratic and undesirable results during our testing, which caused abrupt cutoff of the RF waveform. This will generate a large amount of harmonic energy on the air, causing key clicks. The QSK setting default is 100 ms, and it is recommended to leave it set to the default. In general, there was substantial variation in the key-down-to-RF transmit times, and depending on the code speed, the dit and dah lengths could change as well. Xiegu has confirmed that they are working on a firmware update to fix some of these issues. Xiegu has also made hardware changes that will be implemented in units manufactured going forward. If you have an original unit for which the newest firmware doesn't fix some of the CW issues, Xiegu has offered to upgrade existing units in the field for a fee. Contact Xiegu for more information. — *Rick Ciervo, W1CIE, Senior Laboratory Engineer*

turn off the X6200, press and hold the **POWER** button until the radio turns off. This takes about 5 seconds. As you can see in the lead photo, the display is large and easy to read, while providing a tremendous amount of simultaneous information. Virtually everything you need to know is shown — including the receive spectrum, filter bandwidth, waterfall, and all the different operating parameters.

CW Operation

Next, it was time to have fun. I began with my favorite mode — CW. Tapping the **KEY** button brings up one of two CW menus. One menu permits you to adjust keying speed, key type, iambic keyer mode, and CW tone frequency, and to monitor tone level. Tap **KEY** again and you can set the break-in time delay and the dot/dash ratio, and turn the CW trainer on and off. Because I adjust keying speed frequently, I normally leave the **KEY1** menu up. You can select either CW or CWR (reverse) with the CW mode key on the top of the radio. Tap the digital filter (**DFL**) button to select one of three default filters: 500 Hz, 250 Hz, and 1200 Hz. Each of these filter bandwidths can be readjusted if desired. The default break-in delay is 100 ms, but it can be set from 0 to 1 second in 10 ms increments. However, the delay will never be less than about 50 ms due to the SDR signal processing latency. I set the break-in delay to 500 ms to minimize the T/R relay clicking, which works well for casual QSOs. For DX chasing you will want to set it for less. I operated CW on 40, 30, 20, and 17 meters using a 43-foot vertical. The CW reports were all excellent, with no reports of key clicks or chirps.

SSB Operation

I operated SSB mostly on 20 – 10 meters with my 43-foot vertical. For SSB on 40 meters, 5 W is a pretty marginal power level, but it is reasonably effective on the higher bands. The three SSB default receive filter bandwidths are 2900 Hz, 2400 Hz, and 1800 Hz. Again, the filter bandwidths can be modified easily if desired. All transmit audio reports were very complimentary. There is a speech compressor that is easily enabled, and added "punch" to my signal, as reported by several folks I talked with. In almost all cases, hams I talked to couldn't believe I was running just 5 W.

Digital Modes

The X6200 can be operated with a computer and sound card for RTTY, PSK, JT65, or any of the other popular digital modes. The computer interface is via the **DEV** port on the X6200, using the supplied USB-C/USB-A cable. There are built-in decoders for RTTY, CW, BPSK, and FT8. I am not a digital operator, but because the decoders are built into the X6200, I just had to do some monitoring. The RTTY, BPSK, and FT8 decoders work well. The CW decoder works well for stronger signals that are almost perfectly sent.

Additional Features

The X6200 has most of the features you would expect to see in transceivers today. These include receiver preamp and attenuator, RIT/XIT, and split operation. There are five voice message memories and five text memories. And there are 200 frequency memories. All of the radio functions can also be accessed through the hand microphone. Finally, for the more advanced operator, the X6200 includes 2.4 GHz wireless LAN and Bluetooth features.

Conclusion and Final Thoughts

I found the X6200 transceiver very easy and enjoyable to operate. Because of the SDR architecture, more capabilities and features will undoubtedly be added over time. Finally, there is an X6200 user group at **https://groups.io/g/FXradio**. It is certainly worth joining in order to keep up with operating information, problems, and firmware updates.

Manufacturer: Chongqing Xiegu Technology Co., Ltd. 5th Floor, Building A, No. 8 Qingfeng South Rd., Keyuancheng, Tangxia Town, Dongguan City, Guangdong Province, China. **www.cqxiegu.com**. Distributed and supported in the US by select US distributors. Price: X6200 HF transceiver, $799; extra battery, $70.

Ham2K Portable Logger

Reviewed by John Leonardelli, VE3IPS
ve3ips@gmail.com

The portable logger (PoLo) by Ham2K is an exceptional logging tool designed for amateur radio enthusiasts participating in Parks on the Air® (POTA®), Summits on the Air (SOTA), World Wide Flora and Fauna (WWFF), and similar activities. Optimized for smartphones with data plans, it offers seamless on-the-go operation. Its standout feature is a clean, user-friendly interface, making logging quick and intuitive — even during fast-paced pileups. The app automatically updates its database, ensuring the latest park and summit information is readily available. This eliminates the need for manual updates and lets users focus entirely on their activations.

The Origin of PoLo

PoLo was created by Sebastian Delmont, KI2D, an active portable operator who sought a better solution after finding other loggers frustrating or limited. Initially a personal project to meet his needs, PoLo evolved through feedback from a highly engaged user community. With its open-source, modular design, PoLo empowers users to customize and improve the app to suit their preferences. Active forum discussions and feature requests further underscore its strong user base and commitment to continuous improvement.

In the early days of portable operations, I relied on the ARRL MINILOG and a pencil. Transferring paper logs to a PC logger, however, was tedious. To simplify this, I tried going paperless with a laptop in the field. Over time, I experimented with various setups:

- Laptops: large, heavy, and difficult to use inside a car, even with a steering wheel desk.
- Netbooks: compact but slow, with screens that were hard to read in sunlight.
- Tablets (Android and Apple): lightweight, but pen inputs were finicky, and adding a Bluetooth keyboard negated portability.
- Power banks: essential for extended sessions but added complexity.

The constant juggling of devices, cables, and hotspots made field logging cumbersome. A notebook failure that resulted in the loss of 6-meter sporadic-E logs forced me to seek a better solution. For an upcoming DXpedition, I needed a reliable, lightweight, and intuitive solution. Using a laptop in 40°C heat wasn't practical, and I wanted dependable QRZ lookups to verify call signs during pileups. After frustrations with other Android logging apps, I discovered PoLo.

Use Smartphones for Portable Logging

Today's smartphones offer better speed, portability, and internet access than older netbooks, making them ideal for logging. With a smartphone-based logger like PoLo, I can:

- Easily input call signs with live lookups.
- Send log files to my email for backup and uploads.

Bottom Line

The Ham2K PoLo is one of the fastest and easiest ways to log your amateur radio operations on the go.

• Operate seamlessly with one device — no sun glare, no clamshell hassles.

• View on-screen QSO counts, distances, and operator names.

Initially, I thought PoLo was overly complex due to its powerful features. However, after reading the manual and practicing during a flight to Aruba, I quickly mastered it. For park-to-park contacts involving multiple parks (e.g., 2-fers or 3-fers), PoLo's ability to log all parks simultaneously is a game-changer, saving time and effort.

Key Features

Multi-Operator Support

PoLo supports husband-and-wife or family teams activating on weekends, managing multiple operators seamlessly.

Dual-Program Logging

In Europe, WWFF is their version of POTA, and many parks are part of both programs. For example, during my Aruba activation, I used Ham2K PoLo to log contacts for both POTA and WWFF, generating separate logs effortlessly. No need for manual data entry into separate systems.

Contact Search

During my activities, I worked some special event stations and memorable contacts that I wanted to send a QSL card to. PoLo searches all logs on the device for matching contacts.

Free Availability

PoLo is a free download from the iTunes Store (for iPads and iPhones) and Google Play Store (for Android devices).

App Overview

Settings Tab

• Add your call sign.

• Enable dark mode, prevent screen locking, or choose right/left-hand mode.

Figure 4 —The PoLo "Spots" tab. Clicking a spot populates the QSO tab with all contact details, enabling quick responses.

Figure 5 — The Polo "Map" tab, showing your contact locations by band on the map.

• Set up QRZ and SOTAwatch log-ins for automated call sign lookups and self-spotting.

• Access the Ham2K forums and Discord server for discussions.

Main Screen: New Operation

• Enter the station call sign, location, and operator details.

• Select your activity (e.g., POTA). The app uses smartphone GPS to show nearby parks or allows manual searches.

• For multiple-park activations or WWFF logging, add all relevant parks, and PoLo will manage the logs automatically.

QSO Tab (see the lead photo)

• Enter the hunter's call sign, and PoLo will perform a QRZ lookup to display their name, city, state/province, and distance.

• Record signal reports and notes before saving.

• Visual feedback includes emojis, country flags, QSO counts, and status icons (e.g., a coffee cup for contributors).

Spots Tab (see Figure 4)

• PoLo supports live spots for POTA, SOTA, and WWFF.

• Clicking a spot populates the QSO tab with all contact details, enabling quick responses.

• Filter by band and mode for better management.

Map Tab (see Figure 5)

• After your activation, view a map displaying contact locations by band.

• Use this feature for antenna analysis and radiation pattern insights by comparing contacts made with different antennas.

Operations Tab

- Add station details, locations, and activities.
- Export logs in ADIF or Cabrillo format for easy uploads to POTA, WWFF, or contest platforms.

Use Cases

Aruba DXpedition

During a DXpedition to Aruba, PoLo made logging effortless. I logged contacts directly on my smartphone, relying on its data plan for call sign lookups and file backups. Even in areas without cellular coverage, PoLo stored all data locally, allowing me to export logs later. After returning to my condo, I used PoLo to email logs, upload them to POTA/WWFF websites, and send QSL cards via QSOCardCreator.

Winter Field Day Plus POTA

Combining Winter Field Day (WFD) with a POTA activation was seamless. While PoLo handled POTA logging perfectly, it lacked the dashboard features of *N3FJP WFD Contest Log*. However, I exported ADIF files from PoLo and imported them into *N3FJP*, viewed the dashboard for multipliers, and then generated the WFD log submission. This streamlined workflow eliminated the need for separate loggers. Please note that the current PoLo versions include full support for multipliers, scoring, and summaries for WFD, Field Day, and QSO parties.

Tablet Mode

Tablets offer additional flexibility with larger keyboards and side-by-side views. For example, on an iPad mini, horizontal mode allows simultaneous display of info, spots, or maps. A smartphone hotspot may be required for internet connectivity.

Future Features

Ham2K plans to introduce cloud syncing, CAT control, and desktop versions for Windows, Mac, and Linux in 2025. Features like CAT control will allow users to click on an active spot and automatically tune their transceiver to the activator's frequency. Search-and-pounce operations will also benefit from auto-logging of radio frequencies. If the Windows release allows all the goodness of the smartphone app with a sidebar display of spotting or map information, PoLo could make for an interesting logger for home use.

Conclusion

With its robust functionality — including automatic database refreshes, reliable backups, and efficient multi-program logging capabilities — PoLo is a game-changer for portable operators. It's an indispensable tool for portable amateur radio operators looking to streamline their activations and log upload workflow.

Manufacturer: Ham2K by Sebastian Delmont, KI2D, **www.polo.ham2k.com**. Price: Free and open-source, but donations are welcome.

Lynovation CTR2-MIDI

Reviewed by Pascal Villeneuve, VA2PV
va2pv@arrl.org

For many years, Lynovation has been creating low-cost devices to interface with different software and radios.

The CTR2-MIDI is a small MIDI controller that can be used in combination with CAT software. You can program button functions and use the main VFO knob encoder to change frequencies, adjust volume, etc.

The CTR2-MIDI is another product designed by Lynn Hansen, KU7Q. It can work on different types of devices, and it's supported by the popular iOS and macOS software developed by Marcus Roskosch, DL8MRE, like *SmartSDR* (for FLEX radios), *SDR-*

Bottom Line

The CTR2-MIDI is a low-cost controller for remote software operations. It adds quick and easy access to functionalities similar to a physical radio.

Figure 6 — The CTR2-MIDI beside a 10.5-inch iPad Pro.

Control (for Icom radios), and more. Also supported are *Thetis* and the RHR Console from Remote Ham Radio (**www.remotehamradio.com**). In addition, it works with other radio control apps like Simon Brown's *SDR-Console*, *SparkSDR*, and *piHPSDR*. The manufacturer also mentioned that if the app supports MIDI control, the CTR2-MIDI should work with it. Keep in mind that the control functionalities will vary depending on the software used.

For this review I used the CTR2-MIDI firmware version 1.02.01 (February 2025), and all of my experiments were done using only the *SDR-Control* software for Icom radios, with all three versions — MacOS, iPad, and iPhone. For more details about the *SDR-Control* software from Marcus, DL8MRE, you will find the review in the November 2022 issue of *QST*.

Description

Measuring only 2.36 × 2.36 × 1.3 inches (including the VFO encoder knob), it feels heavy because of the solid metal VFO knob, so it's impressively stable on the desk for its size. See the CTR2-MIDI beside my iPad Pro, which is 10.5 inches, in Figure 6.

On the back of the unit (see Figure 7), you will find a USB-C port for connectivity, firmware upgrade, or powering the unit. This unit can connect via Bluetooth or USB; it doesn't have an internal battery, but a third-party solution exists (see **https://shop.g7ufo.radio/products/kit-battery-add-on-for-lynovation-ctr2-midi-and-ctr2-micro**). Without a battery for wireless Bluetooth connectivity, you will need a power source connected to the USB port. Beside the USB-C connector there is a "Paddle In" 3.5-millimeter (⅛-inch) stereo input jack that can be configured to use a paddle or a straight key/PTT.

On top of the unit, you will find the encoder, which I call VFO; this is also a pushbutton that is used to toggle between four modes, with each mode having a primary and secondary function. There are two yellow LED lights on the top left, which are used to provide an indication of the selected mode. In the first mode, the two yellow LEDs are off; in the second mode, only the one below is on; in the third mode, only the one above is on; and in the fourth mode, both are on. If you continue past the fourth mode with a short press, you get back to the first mode with both LEDs off. These modes are very useful. For example, in the first mode, the encoder knob is used as a VFO, the second mode can be programmed so the encoder knob becomes the control for the volume, and so forth. All of these knobs are customizable.

On the top right side, there is a red LED for "TX indication" and a green LED below indicating "Paddle mode." If you give a long push on the VFO encoder knob, it will toggle between paddle mode (green light off) and key/PTT mode (green light on). If you use a mono connector

Figure 7 — The CTR2-MIDI rear panel.

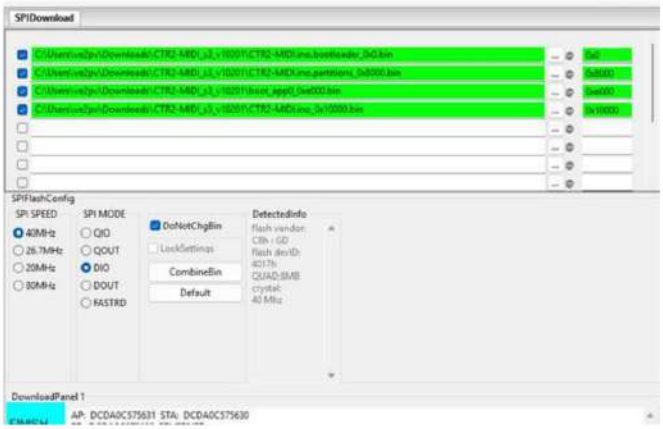


Figure 8 — Windows PC screenshot of the *Espressif* software with the firmware update completed.

Figure 9 — The iPad *SDR-Control* software Tools menu.

for the key/PTT mode to the paddle input, you can build an adapter cable to use only the tip and the sleeve of the stereo connector, or you can simply change the mapping in the app for MIDI control 21 or 31, depending on which paddle mode the CTR2-MIDI is in. That way, it won't matter if the ring terminal is grounded by the mono plug.

There are also six programmable pushbuttons, labeled MFB1 to MFB6. The first three are located at the left of the centered encoder knob; the one at the top is MFB1, and the one at the bottom is MFB3. On the right side of the encoder knob there are three other buttons; the one at the bottom is MFB4, and MFB6 is the one at the top (see the lead photo). All of these are customizable. The MFBx buttons can be used to activate or deactivate functions like noise reduction (NR), noise blanker (NB), switching between filters, etc. You can also use a combination of the buttons to activate or deactivate functions like turning on and off the Bluetooth radio (more on this later).

Firmware Update

Updating the firmware is very different from what I'm used to. The CTR2-MIDI uses the ESP32-S3 processor, and you will need to download a third-party flashing software called *Espressif Flash Download Tools* (**www.espressif.com/en/support/download/other-tools**), which is more of a developer's tool for this platform. It's available only for Windows PCs, with Windows 7 or higher. Everything is explained in detail in the 38-page CTR2-MIDI operations manual. Both the firmware and the manual can be downloaded from the manufacturer's website (**https://ctr2.lynovation.com/download-ctr2-midi-firmware**).

Once you've downloaded the latest firmware and the *Espressif* software, you will need to connect the CTR2-MIDI to a Windows PC USB port. I was unable to do this on macOS, but according to the manual this can also be done using terminal software like *PuTTY*. Next, you will need to follow the multiple steps shown in the manual. I encountered an issue with the COM port detection to flash the firmware, so I followed the manual and had to find the very small button to force it into program mode. This small button is located beside the USB-C connector inside the unit, but it is accessible without dismantling the unit. Pressing on it using a toothpick (as recommended in the manual) while connecting the USB port worked on the first try, and the upgrade was done in a few seconds. See Figure 8 for a screenshot of the *Espressif* software with the update completed.

The Lynovation YouTube channel has a video showing how to update the firmware (see **https://youtu.be/Si0i80jzNyQ**).

Connectivity

As mentioned previously, the CTR2-MIDI can be connected to your application either using a USB cable or via Bluetooth. But because you always need a power source via USB, I prefer using the USB connection directly to the computer or mobile device, as using Bluetooth won't make the CTR2-MIDI completely wireless. It will draw power from the computer, phone, or tablet, and you may need a special adapter if the mobile device needs to be charged at the same time, so Bluetooth may come in handy if you use a separate power source for the controller.

When using USB, you connect the USB cable before starting the application. With *SDR-Control*, you go into the **TOOLS** menu (see Figure 9) and select "MIDI Controller" (see Figure 10) or "CTR2 Controller" mode (see Figure 11). The "CTR2 Controller" is the preferred mode because it's preconfigured for the CTR2-MIDI.

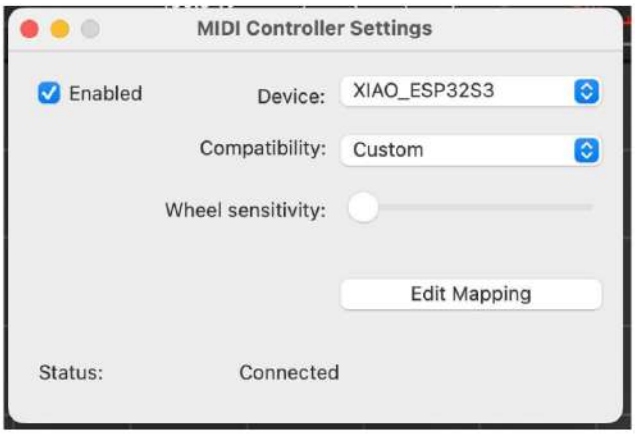


Figure 10 — The *SDR-Control* MIDI Controller settings for USB connection mode.

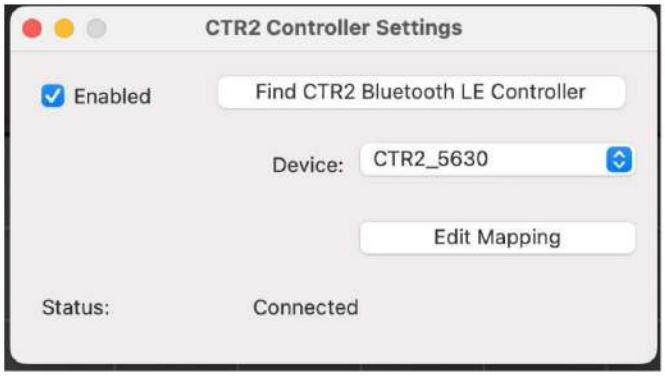


Figure 11 — The *SDR-Control* CTR2 Controller settings for Bluetooth connection mode.

Keep in mind that the MIDI Controller and the CTR2-MIDI tool in this app support both connection modes. Every time you toggle between the two connection modes, you will need to restart the software and the controller by unplugging the USB cable, as there is no power switch on the unit.

With the new firmware, both modes (the iOS and the macOS versions) in *SDR-Control* are equally easy to set up. In previous versions, the Bluetooth connection required a third-party MIDI software so the device would recognize the controller; now you can simply click on "Find CTR2 Bluetooth LE Controller," and it will find it instantly (see Figure 9 for the controller settings for the CTR2 Controller mode).

If you have the mobile version of *SDR-Control* for iPhone, only the Bluetooth CTR2 Controller mode is available. I have the software version running on my iPhone 15 Pro, and I'm able to power the unit using a USB-C-to-USB-C cable while running in Bluetooth — but I don't know for how long. Most of the time when I use the iPhone app, I can't attach the CTR2-MIDI to it, as I'm usually on the move.

Customizing the CTR2-MIDI

When you download the latest firmware, it includes three files with a ".map" extension. These are preprogrammed for different platforms (FlexRadio, Icom, and Thetis) to give you a starting point for controlling your radio. These files can be customized directly into the remote software.

To customize mine, I had to look at the manual and use trial and error. With *SDR-Control* you can import the mapping settings from the provided files with the firmware, customize it, and export the file. This can be shared via iCloud and imported on another device. That's what I did to have the same configuration on my iPad and my Mac. Keep in mind that if you use the Bluetooth and the USB connection, you will have to import the mapping into both connectivity modes (see Figures 10 and 11).

You can do many things with the CTR2-MIDI. I can't list them all in this review, so it is best to read the manual to learn more about the possibilities.

Using the CTR2-MIDI

Once you've completed the setup, updated the firmware to the latest version, and customized the button functions, you're ready to play.

After a little while you will get accustomed to your CTR2-MIDI configuration. It just adds a radio feel to your remote software operations. It's way more intuitive than using the iPad touchscreen for commonly used functions. With the CTR2-MIDI, I now have a physical VFO knob for my mobile device using the *SDR-Control* software. I can also quickly adjust the volume; change bands, modes, and filters; and activate frequently used functions like NB and NR — all without the need to use the iPad touchscreen. Plus, it's small enough to be carried around in a backpack or directly in a pocket.

The unit doesn't seem to draw a lot of current on my mobile device. I didn't measure it, but I frequently use it in USB mode on my iPad and have never run out of power, though it's rarely used more than 2 hours at a time. According to the manual, when the Bluetooth radio is on, the CTR2-MIDI draws around 93 mA. When Bluetooth is off, the current draw is around 43 mA. The Bluetooth radio can be turned on and off by pressing the **MFB6** and **ENCODER** buttons; a Morse code signal will be heard for the active status ("BLE 0" means Bluetooth radio is off, and "BLE 1" means Bluetooth radio is on).

Conclusion

If you're using any of the compatible software, especially *SDR-Control* or *SmartSDR*, to control your radio, you can't go wrong with the CTR2-MIDI. It's inexpensive for what it does, and firmware updates are frequent. It provides a better operating experience than just a software interface, while allowing quick and easy access to functionalities that make the operations feel more like a physical radio. Note that Lynovation recently released a new product called CTR2-Dial, which consists of a CTR2-MIDI with an added touchscreen.

Manufacturer: Lynovation, **www.lynovation.com**. Price: assembled unit, $69; kit, $49.

Dave Casler, KE∅OG, askdave@arrl.org

Ask Dave

Get more information from the "*QST:* Ask Dave" YouTube playlist at **https://bit.ly/3z2MBMI**.

Equipment Maintenance, Emergency Phrases, and Tuning

Sometimes, It's as Simple as Cleaning

Q Paul Lux, K1PL, asks: I have a dipole that sometimes goes dead, and nothing is heard. Sending out a single dit with my FTDX101D can bring it back to life. Sometimes, after working fine, it goes back to zero signal, which can be an issue in the middle of a contact. What's going on, and how do I fix it?

A I've had this same problem. You have a dirty mechanical connection in your antenna system or a radio that needs cleaning. It's just enough of an issue that a single dit can cause an almost imperceptible arc across the mechanical connection to fix the issue, at least for a while. Picture the entire path between your radio's transmitter section and the antenna. There are coax connectors, relays, and any RF wiring that is screwed down. Also, many elements of your ground system have mechanical connections because that is the best practice for grounding. A bad solder joint can conduct sometimes, but other times, it will not.

Any ham station that's more than a couple of years old will encounter this problem. The root cause is gradual corrosion. The solution is to clean all of the mechanical connections. Get some contact cleaner like DeoxIT D5. Spray the cleaner on the center plug and sleeve. Clean the male plug with the cleaner and a lint-free microfiber cloth. Spray some more on the center, put the coax into the female receptacle, and work it back and forth. A Q-tip can be used to get into the receptacle. Do this for all coax connections. You may want to lower the problem dipole to the ground to spray the connections and untighten and retighten them. If you have coax switches in your shack (I have two Alpha Delta Delta-4 switches in mine), open them up to spray the contact cleaner. Then move the switch rotor back and forth and wipe them out.

You will find mechanical contacts in your antenna tuner that you may need to clean. Your radio is quite new, and its relays are sealed, so checking that would be a last resort. You should do this cleaning once a year or so. Note that crimped coax connectors can have this same problem. Try re-crimping the connector. In older-style connectors, make sure the coax shield is properly soldered through the little holes on the side. A touch of rosin flux (not acid flux used in plumbing) can help with the soldering.

When this happens to me, I do an antenna tuning cycle with my Icom IC-7300. That usually brings things back to life for my entire radio session.

Using CW for Emergencies

Q Jouni Hiltunen, OH2GVD, of Finland, asks: How should distress calls be made using CW? There seems to be little or no information about how this should be done.

A There are two possibilities. First, if an emergency response net is already set up, you can check into the net. In the US, the custom is to say "break break break" to indicate you have urgent traffic and need to break in. This is why FM users should always leave a pause after each transmission. This is usually done via voice modes because emergency responders rarely know Morse code. Second, if you have an emergency and no access to commercial communications systems such as cell phones or landlines, your first resort is probably VHF systems using voice. If CW is what is available, like in the instance of using QRP CW for a Summits on the Air event, it's perfectly okay to use this. The procedures in Finland may differ from those in other places, but most countries around the world have agreed to say "Mayday, Mayday, Mayday." It should be said three times in English for voice. This is a very distinctive sound and will attract attention.

When someone calls you, you need to give your location first. Your location can be in reference to a well-known landmark, a kilometer marker on a numbered highway, or even GPS coordinates. Note that Maidenhead grid squares should not be used because they will mean nothing to an emergency responder.

The next item of information you should provide is the nature of the emergency, such as "I broke my leg coming down the Karhunkierros Trail." Once the ham

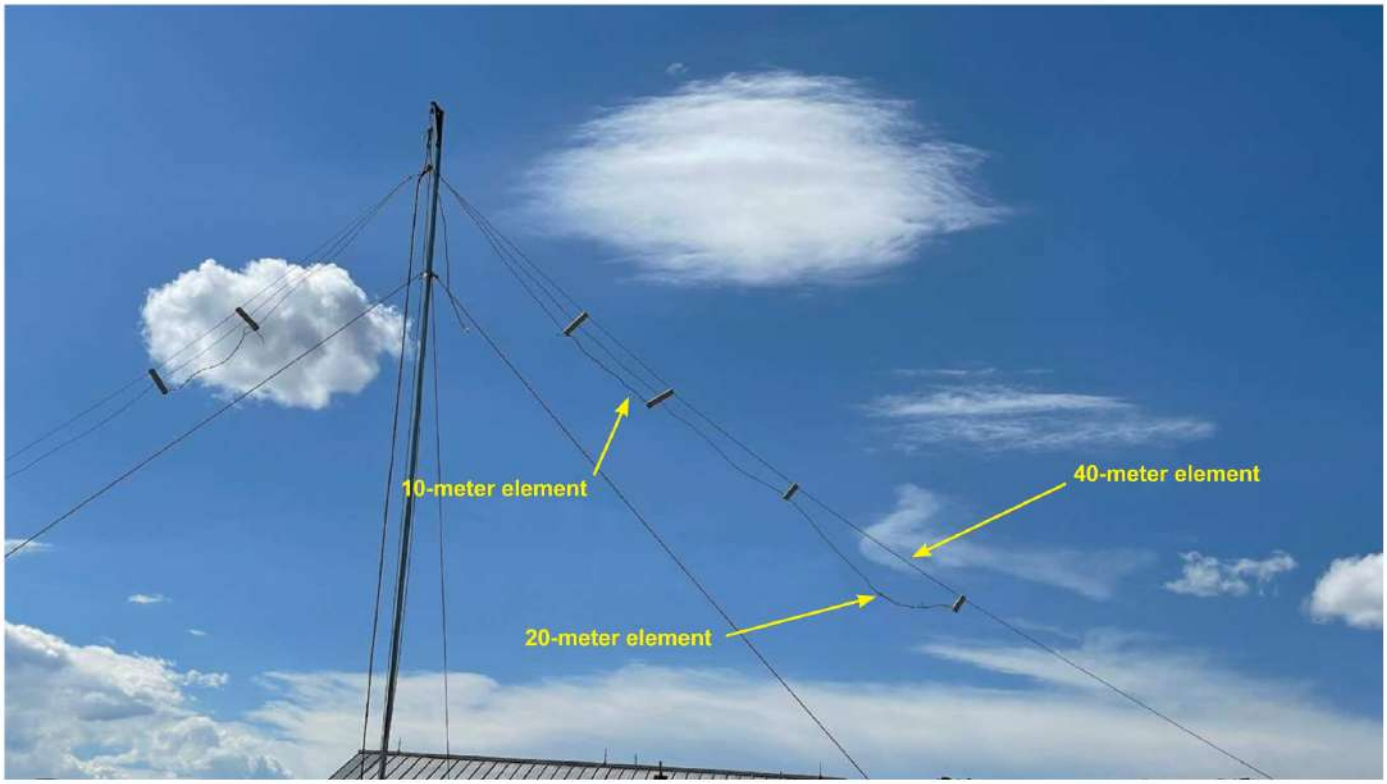


Figure 1 — A close-up of a homemade fan dipole built for 40, 20, and 10 meters. The antenna also tunes up well on 15 meters. [Dave Casler, KEØOG, photo]

on the other end of your communication has the first responders on the line, they may have more questions for you. They will want to keep your communications going until help arrives.

For CW, the procedure is nearly identical except that the distress call is "SOS SOS SOS." If no one comes back to you, send your location, SOS, and your call sign in case someone is listening and can call the proper authorities. Note that SOS is simply a prosign, not an acronym.

Check these procedures with your local club to see if there are any local differences.

Tuning Troubleshooting

Q Rodney Price, KG5FPJ, asks: I'm building a fan dipole for 20, 15, 10, and 6 meters, similar to Figure 1. I was able to get 20 and 10 meters working. Then I tried to add 15 and 6 meters; 15 meters worked, but 6 meters would not tune. I rebuilt the entire project several times. On my fifth try, before adding the 6-meter element, I checked the standing wave ratio on all the bands. All the intended bands tuned, including 6 meters — even without the 6-meter element. How did that happen?

A The first rule of antennas is that everything affects everything. Many folks have noticed they can use their radio's tuner to transmit on 15 meters when the antenna is cut for 40 meters. This is because 15 meters (21 MHz) is near the third harmonic of 40 meters (7 MHz). The relationship isn't perfect, but it works with a modest tuner. I looked at various combinations of harmonics on your antenna to see what might be going on, but I couldn't find an obvious relationship.

I suspect that if you move the antenna higher, lower, or to a new position, its frequency response might be different. Also, without a 6-meter element, the radiation pattern for 6 meters may be oddly shaped.

Send your questions to **askdave@arrl.org**. I answer some questions here, and some via videos on my YouTube channel (**www.youtube.com/davecasler**), or during my weekly livestream on Thursdays at 6:45 to 8:15 PM Mountain Time on my channel.

Supporting the Lone Rock Fire Response

ICS and ARES training merged in the fight against a massive Oregon wildfire.

Stephen Saltzman, AE7NW

The Lone Rock fire began on July 13, 2024, in north-central Oregon. Within weeks, it grew to consume almost 140,000 acres — equal to almost 10 times the size of Manhattan.

Though much bigger in area than the land affected by the January 2025 fires in Southern California, this part of Oregon is sparsely populated; there are fewer than 23,000 people in the four affected counties combined. This meant that relatively few people had to be evacuated. Of course, it also meant that there were few local resources and little infrastructure available to fight the fire. It took about a month for the fire to be 98% contained, and for all of the evacuations to be called off.

The Collective Response

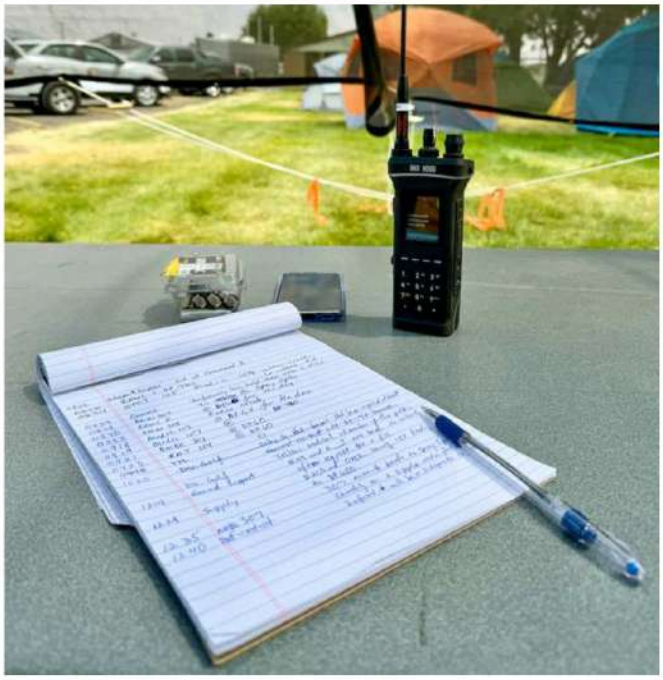
This was the first Federal Emergency Management Agency (FEMA) activation I've participated in, and frankly, I was blown away by how well it worked. Despite the remoteness of the location, a "town" of 876 people was created almost overnight to respond to the incident, including staff from the US Forest Service, National Weather Service, Federal Aviation Administration, Oregon Department of Forestry, and more.

A formal Incident Command System (ICS) was established, with sections for planning, logistics, operations, and finance. ICS is a framework often used in emergency situations to define and delegate the roles, responsibilities, and resources used in the response.

The Comms Team

The Communications (Comms) Tent was placed next to the Medical Tent to facilitate coordination. I was told that this is standard practice at all FEMA deployments.

There were two to five radio operators on duty from 8:00 AM to 10:00 PM, and one to two radio operators for the graveyard shift. I was one of two volunteers from Multnomah County Amateur Radio Emergency Service® (ARES®), along with David Bumpus, AI7TG. The paid staff were all Fire and Rescue communication professionals from Oregon, Washington, Colorado, and Nevada. There were also four professionals managing, fixing, and occasionally relocating four mobile repeaters covering the disaster zone. All were under the watchful and supportive eye of acting Comms Leader Cas Hoag from Reno Fire and Rescue.



The primary Comms Log maintained by the Comms Team throughout the response.

Comms Team Duties

The pad in the lead photo was the primary Comms Log. Information on the pad was added to proper ICS-309 forms during slack periods, and then the scratch paper was turned in with the ICS-309 forms at the end of every day. Both were audited for consistency.

There was one big difference between my normal ARES and Community Emergency Response Team exercises and the Lone Rock Fire response: my radio communications were mostly with tired firefighters working in the heat and smoke, not trained Emergency Communications radio operators. In general, the firefighters didn't speak slowly, use prowords, or spell things out using International Telecommunication Union phonetics. Instead, they used a lot of their own slang and acronyms.

Most forms of voice traffic were location updates (e.g., "AMBO 36 in transit to DP60," or "REMS staged at DP64"). The next most common were requests for supplies (e.g., "2-mile-long fire hose needed at DP60"). AMBO refers to ambulance, REMS refers to Rapid Emergency Medical Service, and DP refers to Drop Point.

All location updates were marked on 3 × 4-foot maps, which were important for things like identifying the closest ambulance to respond to medical emergencies. An 8.5 × 11-inch map showed the RF propagation coverage of the four mobile repeaters surrounding the fire. This map was invaluable for ensuring that responders were never stranded in harm's way without radio communications, and it was generated using **www.cloudrf.com**. The site also offers a free plan, as shown at **www.cloudrf.com/plans**.

Other duties included programming and providing radios to responders. In this case, the radios we used were $2,300+ Bendix King VHF radios, which are the standard for forest fire responders in the US. These handhelds are huge, in large part because of the size of the batteries required to ensure 12+ hours of operation. Of course, they're also built to withstand a lot of abuse (e.g., MIL-STD-810 and IP68 ratings). Note the size comparison to a Yaesu FT-5D in Figure 1.

Within the Comms Tent, we used Icom commercial handhelds to communicate with others at the Incident Command Post, but all voice traffic from the mobile repeaters was routed to an on-site Private Branch Exchange. The traffic was then sent to Voice over Internet Protocol phones that each had a push-to-talk button in the handle.

An Incident Within the Incident

The most stressful episode on any of my shifts was when we had what is known as an *incident within the incident*, or an immediate need for medical evacuation as part of the larger disaster response. In this case, the patient was a local resident in distress who was discovered by firefighters near the fire. The call initially came in as Code Yellow, meaning a medical emergency in which the patient is alert and breathing. We notified the Medical Tent and radioed for the closest ambulance to pick them up.

While the ambulance was en route, the patient's condition was changed to Code Red. One of the on-site air traffic controllers had to be brought into the Comms Tent to call for a Life Flight Network helicopter from Portland, about 130 miles away. We needed to radio to the Crew and Ground Team to scout the closest location to the patient on which the Life Flight helicopter could land. None were found nearby, so rather than clear an area for the helicopter, the decision was made to have the closest ambulance pick up the patient and transport them to a field where the helicopter could land.

Figure 1 — Heavy-duty Bendix King VHF handhelds on either side of a Yaesu FT-5D. All were used in the fire response.

Shortly after the helicopter took off, a large thunderstorm developed between Portland and the designated pickup area, so we had to activate a different helicopter from Bend. We were told the patient was still alive when he reached the hospital in Bend, but we received no updates after that.

An ICS and ARES Success

ICS works! Almost overnight, nearly 1,000 people from many different agencies and states set up a high-functioning Incident Command Post in the middle of nowhere, and in due time, a 140,000-acre fire was contained. ARES training works, too. I was fielding voice traffic and filling out ICS-309 forms within minutes of parking at the Incident Command Post.

All photos provided by the author.

Stephen Saltzman's, AE7NW, wireless education began when he started and ran Intel's Wi-Fi division, and later headed wireless investments for Intel's venture capital arm. Those experiences exposed him to ham radio, but weekly commutes to Silicon Valley and raising two boys with his wife, Becki, meant putting off getting licensed until he retired in 2019. Since then, Stephen has been an active radio operator with both Multnomah County ARES and Portland Neighborhood Emergency Teams. He can be reached at **stephen@saltzman.net**.

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An Emergency Operations Center Station Alternative

Amateur radio speeds up severe-weather alerts with help from commercial television.

Gordon Mooneyhan, W4EGM

The KOCO television news station in Oklahoma City, Oklahoma, sits in Tornado Alley. Frank Johnson, a meteorologist at the station, helped implement a program where an amateur radio operator would be at the station during tornado watches and warnings. It created a symbiotic environment. The ham at the station had access to live weather radars and could relay the latest information to spotters in the field. KOCO was able to get reports at the same time as the National Weather Service (NWS) and got the report out to their viewers 30 – 45 seconds before the NWS sent it out. When it comes to tornadoes, seconds can make a difference. In 2007, Frank moved to South Carolina and became the Chief Meteorologist at WBTW News in Myrtle Beach. He saw the advantage of having a ham at the station for hurricanes, and his perseverance paid off.

Hurricane Matthew

On October 6, 2016, Myrtle Beach was in a hurricane warning. Since getting licensed in 1993, my usual post during storms has been at the Myrtle Beach Emergency Operations Center (EOC). However, the city recently relocated the EOC, and a couple of hams who are city firefighters were chosen to operate it. I was told that my services would no longer be needed, so I called the county Emergency Coordinator, Matt McGuire, AF4UZ, to see where my services could be useful. Less than 5 minutes earlier, he had gotten off the phone with Frank Johnson. Management at WBTW News had given Frank the okay to find a ham radio operator. Matt told me about the offer, and I knew that my Public Information Coordinator (PIC) knowledge would make me a perfect fit. Hurricane Matthew struck Myrtle Beach on October 8, 2016.

Monitoring Hurricane Matthew required a lot of trial and error. I was able to monitor the repeater on EchoLink with my laptop until the interference from hams around the country seeking information became too much. With the RF shielding in the building, my 5 W handheld couldn't get the repeater's signal, and the trustee was forced to shut off the link to avoid interference with the net.

The WBTW News station amateur radio setup, which includes a laptop to monitor the weather, a Kenwood TS-440S HF transceiver, and a Yaesu FTM-100D for VHF communications. The stack of index cards is used to pass messages to the producer. [Gordon Mooneyhan, W4EGM, photo]

Our primary repeater is also on EchoLink, and I pleaded with the trustee not to disconnect it during the storm. At the same time, we were still getting interference from hams. In hindsight, I have nothing but praise for the trustee and how he balanced emergency communication needs with my need to monitor what was happening.

When I arrived at WBTW, Frank introduced me to everyone. The producers didn't understand why I was there until I monitored the local SKYWARN® net and heard a flooding report relayed to the NWS. I copied it and gave it to the producer, who said, "We haven't heard anything about this." I replied, "Wait a few minutes," and returned to my post. After about 5 minutes, the producer came by and said the NWS just broadcasted the flooding report. I smiled and told him I heard the report being sent to the NWS, and that's how I got it early. His reply was, "I get it now," which was priceless.

Working Out the Kinks

Every storm provides a new learning experience. In 2021, the engineering department finally installed a 2-meter vertical on top of the WBTW station. Now, I no longer depend on EchoLink, and I have a choice

of regional repeaters to monitor. I'm sure that made our trustee happy because he turned off the EchoLink connection before another storm arrived and avoided interference with nets.

On January 5, 2024, we were notified of a severe weather outbreak that would affect the entire state on January 9. I emailed Frank, suggesting that this could be the opportunity to implement our annual equipment test, and he agreed. By the time the main storm reached Myrtle Beach, its strength diminished. There were several flooded-road reports, and amateur radio once again proved its worth by getting WBTW the report before emergency management or the NWS broadcasted them.

The storms passed through much faster than initially forecast. Frank checked in with me after it was over and asked if I needed anything else. I mentioned that I have a spare high-frequency antenna at home, and it would be nice to monitor the Hurricane Watch Net. I told Frank I was happy to donate it, as well as an Astron 35 A power supply and an HF radio. A couple of weeks later, I received an email from Frank informing me that management and the engineering department were on board.

Lessons Learned

I've learned several lessons over the past 8 years. Perhaps the most important thing is that whoever is assigned to be at the news station needs to be comfortable talking to the press, especially at the last minute. During every hurricane, an anchor has asked me to be in the studio in about 5 minutes for an interview. That's barely enough time to stop by the restroom and do a quick once-over in the mirror to ensure I'm presentable. Keep in mind that you are in a professional environment, so dress the part. Khaki pants and a polo shirt or business casual attire are acceptable. If you have an ARRL name badge, make sure it's clean. When you speak in an interview, mention the generalities and avoid specifics. The station is doing 24/7 coverage of the storm already. Getting you on for a 10- to 15-minute interview about amateur radio is informative, and it sets the station apart from the competition. It's also a break from the continuous repetition of storm coverage.

With 23 years of experience at EOCs under my belt, the move to WBTW was very welcoming. An online search revealed that WBTW is the only television station in North and South Carolina, and one of the few in the Southeast, with a full amateur radio station for severe weather events and other emergencies. Maybe this will be the start of a new trend.

Chief Meteorologist Frank Johnson discusses his involvement with integrating amateur radio at WBTW News. Access the digital edition of *QST* (**www.arrl.org/qst**) to hear his story.

E. Gordon Mooneyhan, W4EGM, has been the Public Information Coordinator for the South Carolina Section since 2020 and an ARRL Public Relations Committee member since 2019. He won the 2018 Philip McGan Silver Antenna Award for public relations. Gordon retired from a career in business management. He is the author of three railroad dining car cookbooks and *Titanic: A Legal Perspective*, all of which are available at Amazon. Gordon can be reached at **gmooneyhan@gmail.com**.

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2024 SET Success

New Jersey ARES is better equipped for surprise crises, thanks to this trial run.

Michael Prasad, KC2UOA

The Simulated Emergency Test (SET) on October 5, 2024, in New Jersey proved to be a successful collaboration between the American Red Cross and the Northern and Southern New Jersey Sections of the Amateur Radio Emergency Service® (ARES®). In addition to the national Memorandum of Understanding (MOU) between the American Red Cross and ARES, New Jersey has an MOU between the American Red Cross New Jersey Region and the ARRL New Jersey Sections for disaster planning and response.

SET in Motion

The 2024 New Jersey SET assumed a complete disruption of commercial communications within the state, including telephone, cellular, and internet services. This aligns with the Primary, Alternate, Contingency, Emergency (PACE) plan for communications systems continuity of operations, outlined by the Cybersecurity and Infrastructure Security Agency, as shown in Figure 1.

ARES volunteers simulated supporting two served agencies' shelter operators: the American Red Cross New Jersey and local New Jersey County government facilities. The simulation compressed 3 days of shelter emergency communications utilizing voice and digital amateur radio communications into approximately 3 hours. Voice communications were used for resource requests, announcements, and instructions. Digital communications via Winlink were used to transfer formal written messages, agency forms, damage assessment reports, local weather observations, and welfare messages for evacuees. Digital communications were used because they are faster and more accurate than formal verbal message handling. One of the goals of the SET is to utilize the most common technical capabilities (requiring the lowest level of licensing) to cover the wide range of operators, radios at sites, etc., while attempting to cover gaps in radio propagation, interference, and other factors impacting emergency-based voice and data communications.

There were 74 ARES operators for Northern and Southern New Jersey, and seven American Red Cross hubs were simulated. Forty-eight local shelters and Emergency Operations Center (EOC) sites were also represented. The teams handled 283 formal written messages. There were 91 for the American Red Cross, and 192 were directed to or from the local shelters. There were also 245 tactical messages, including 99 for the American Red Cross and 146 directed to or from the local shelters and EOCs. Volunteers put in 194 hours for the American Red Cross and 225.5 hours for the local shelters and EOCs.

Voice and Data Communications Systems Continuity Objectives

The New Jersey region of the American Red Cross follows a pyramid of strategic, operational, and tactical objectives for emergency communications (EmComm), as shown in Figure 2. During incidents that impact

Figure 1 — PACE plan outlined by the Cybersecurity and Infrastructure Security Agency. [Image courtesy of the Cybersecurity and Infrastructure Security Agency]

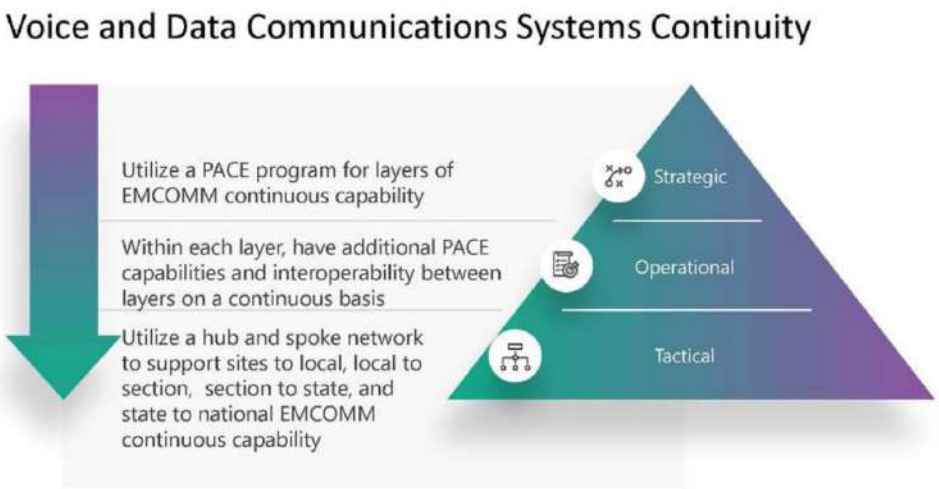

Figure 2 — The voice and data communications systems continuity objectives pyramid. [Michael Prasad, KC2UOA, image]

the entire state, the American Red Cross organizes in a geographic hub-and-spoke model, as shown in Figure 3, using its existing offices for communications and logistics support between locations. Each hub was interoperable between PACE layers, and we also ensured there were redundancies and backups within each layer. For example, a primary voice-based EmComm layer could have copper landlines, Voice over Internet Protocol telephony, commercial cellular, and government emergency telecommunications service/wireless priority service. We are exploring Winlink, VARA FM, UHF/VHF simplex/repeaters, HF (60-meter, VARA), EchoLink, and more for the amateur radio PACE layer in New Jersey. Many of these tools are interoperable between EmComm layers. For example, Winlink can be used where there is commercial internet service and can be connected to places that do not have connectivity.

Challenges

The SET event leaders organized some planned but unannounced changes to disrupt the exercise momentum, such as severe weather, blocked roadways, and evacuee surges to existing shelter sites. These changes were timed and scheduled. However, some challenges occured that were unexpected by everyone.

First, a solo operator at a key communications site canceled at the last minute. This was realigned when the Information Technology Disaster Resource Center (ITDRC), a national volunteer nonprofit organization, was able to step in to support that location for radio communications. Remember to always have additional resources staged to backfill or supplant locations when necessary.

Then there was real-time police activity near an American Red Cross communications hub that caused roadblocks and more than a 2-hour delay at the start of the exercise. Only time could fix this, and message traffic resumed as soon as possible. The solution is being worked out because the physical dispersal of communications hubs depends on the topography, locations, and power of repeaters as well as other technical factors.

As a state, we are continuing to explore different bands, HF (which will require different licensing levels), and other options to bolster the capabilities of critical infrastructure/key resource sites.

Final Notes and Key Takeaways

The 2024 New Jersey SET showed that emergency communications can cover the whole state when the Northern and Southern New Jersey ARES teams coordinate with disaster services technology volunteers from the American Red Cross New Jersey Region. Communications connections for voice and digital transmissions were successful, even when unexpected challenges occurred, like relocating radio operators at the last minute, shifting operations due to frequency interference, poor or degraded equipment performance, and sporadic regional repeater performance.

One of the hallmarks of amateur radio operations for emergency services is demonstrating ARES team flexibility and problem-solving, which was put to the test during this SET. This exercise was successful, and the organizers want to conduct interoperable state-

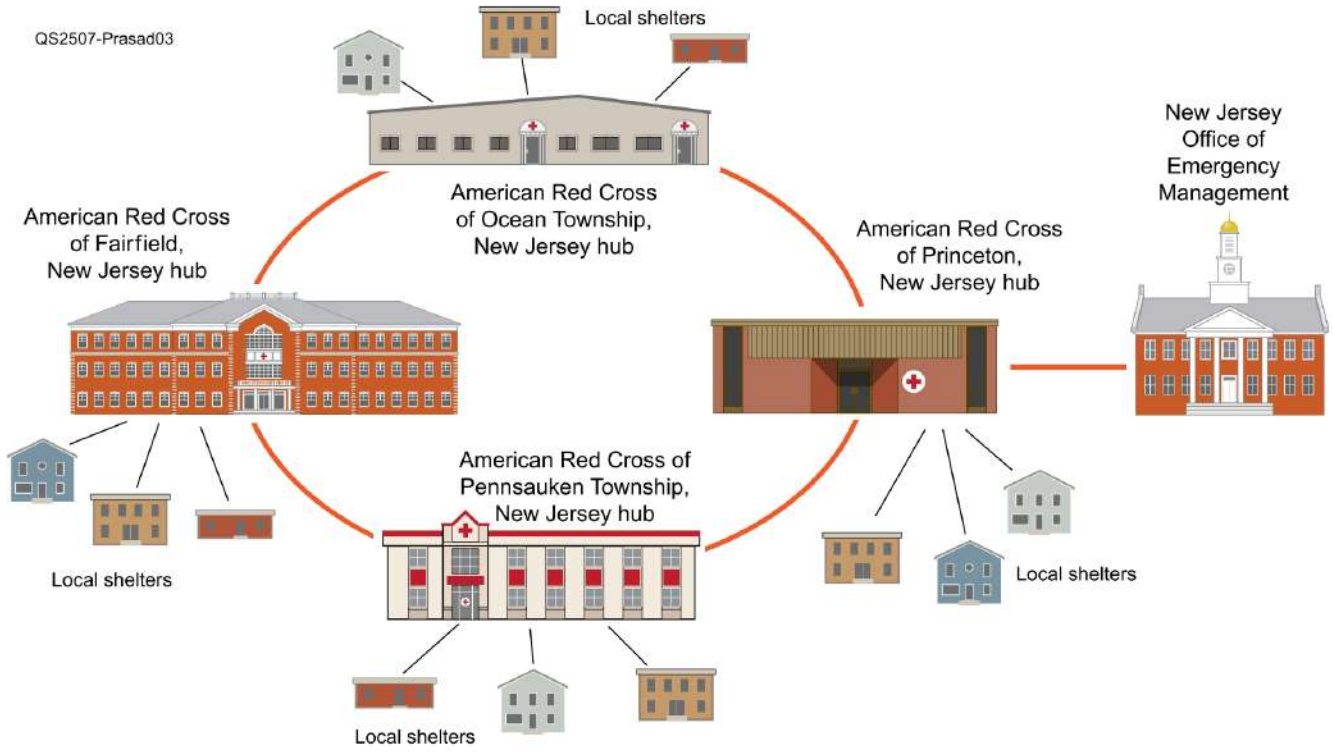

Figure 3 — A rough draft of the hub-and-spoke American Red Cross emergency communications plan diagram. American Red Cross hubs communicate with each other and other local shelters. The hub at Princeton also communicates with the New Jersey Office of Emergency Management.

wide SETs more frequently during 2025 by linking the SETs to the routine monthly nets conducted by the American Red Cross stations, ARES/Radio Amateur Civil Emergency Service, and even Military Auxiliary Radio System/SHAred RESources groups. Many times, these nets are geographically regionalized, and the capabilities and consistent operation of relays, repeaters, and usable frequency bands always need an improvement process. Emergency communications will always involve problem-solving and remain flexible.

SETs provide an opportunity to expand partnerships and support beyond the American Red Cross and ARES teams. During this SET, ITDRC was added as an exercise player to support one of the simulated shelter sites in an area that did not have ARES coverage. ITDRC benefited from this SET by practicing deploying their mobile assets and staff, which included amateur radio. The SET benefited from having the ITDRC team as a viable force multiplier.

These exercises help assess the need to upgrade radio equipment and directional antennas based on further investigation of adding backup bands/frequencies and confirm Winlink capabilities within American Red Cross EOCs. Continuing to involve American Red Cross command and general staff from a National Incident Management System/Incident Command System perspective would benefit everyone because message traffic is meaningful and actionable during the exercise.

Finally, the SET established a working framework for future SETs to be expansive in coverage, possibly including state-operated shelter sites, fixed kitchen sites, points of distribution, and other mass care elements for large-scale incidents. The framework is also in place if the healthcare and hospital networks want to exercise their PACE communications capabilities to include amateur radio.

Special recognition to Northern New Jersey Section SET Coordinator Jim Breheny, N2JLF, and Southern New Jersey Section SET Coordinator Tom Devine, WB2ALJ, for their response work and preparations for this SET exercise.

Michael Prasad, KC2UOA, has been a licensed ham since 2008. He is a Certified Emergency Manager and a long-time disaster volunteer for the American Red Cross. Michael can be reached at **michael.prasad3@redcross.org**.

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A Case for Standardizing EmComm Training

Hams can unify and hone their emergency response with the PACE model, in addition to ICS and AUXCOMM training.

Amateur radio operators trained on the same materials prior to deployment can further cement their role as a critical part of disaster response and recovery.

John Minard, W5JXN, and J. M. Rowe, N5XFW

Amateurs have been instrumental during disasters, serving as a communication system when traditional infrastructure is either overwhelmed or destroyed. When power outages and system failures occur, hams can provide a resilient and reliable means of communication, often enabling messages to be transmitted over long distances, even from or to isolated or remote areas.

In situations such as the aftermath of Hurricane Katrina in 2005, the Haitian earthquake of 2010, or Hurricane Helene in 2024, ham radio operators provided crucial support by relaying emergency messages, reporting conditions, and maintaining communication between isolated communities and emergency services. This ability to function in environments with minimal infrastructure has solidified amateur radio as a vital component of disaster management plans across many jurisdictions.

Despite its critical role in emergencies, the lack of standardized training and protocols for hams can create inefficiencies and confusion during a disaster. The variation in individual skills, familiarity with equipment, and understanding of emergency communication protocols can cause emergency managers to bypass utilizing the untrained (but licensed) amateurs. For this reason, it is necessary to standardize training for hams to ensure that their communication efforts are as effective and efficient as possible, thereby ensuring viability in that emergency communications (EmComm) arena.

EmComm Training Today

Current EmComm training is often informal, and it varies significantly across regions, organizations, and groups. In some areas, ARRL's Amateur Radio Emergency Service® (ARES®) and the FCC's Radio Amateur Civil Emergency Service (RACES) organizations reign supreme in EmComm training. In other places, local radio clubs and groups provide it. ARRL itself even offers EmComm training. But does this training *qualify* an operator to provide for a served agency during an emergency?

As of the 2023 NIMS update, ACMs and AUXCs are considered qualified positions within ICS.

The answers to this question depend on several factors. These include the operator's relationship with the served agency, their current training level and willingness to volunteer for further training, and how they, as a group, have performed during prior deployments.

What if it were possible to streamline and standardize EmComm training nationwide? Comparing the training programs for ARES and RACES to the Cybersecurity and Infrastructure Security Agency's Auxiliary Communications (AUXCOMM) training course reveals a great deal of overlapping material. The primary advantage of AUXCOMM is that, as of 2023, Auxiliary Communicators (AUXCs) and Auxiliary Communications Managers (ACMs) are now organic parts of the Incident Command System (ICS). In the ICS structure of the National Incident Management System (NIMS), a position task book is available for AUXCs to be considered *fully qualified*.

The variety of EmComm training available, with no set national standard, means there is no guarantee that operators will have the same knowledge or skill set when deployed to an incident. This results in issues that often lead to amateur radio being overlooked as an essential response and recovery asset. Some of these issues include:

- Inconsistent communication skills. With a standardized training program, hams would avoid miscommunication, delayed responses, and operational inefficiencies during disasters.
- Lack of interoperability. Operators often work alongside various emergency services and agencies, such as law enforcement, fire departments, and medical teams. Without standardized training, communication between amateur radio operators and first responders may be fragmented.
- Inefficient use of resources. In large-scale emergency responses, multiple ham radio operators may be deployed across different areas to provide communication links. Without clear protocols and training, operators may fail to coordinate effectively, leading to the duplication of efforts and overcrowding of radio frequencies.

The AUXCOMM program is the only current training program with positions mentioned in NIMS. Emergency managers, served agencies, and radio amateurs should accept it as the standard program. The ACM and AUXC have been listed as qualified positions within the Communications Unit of the Logistics Section since the March 2023 NIMS update.

Standardizing EmComm training is imperative for amateur radio's relevance to served agencies. This can be accomplished by training to the AUXCOMM standard, and integrating the Primary, Alternate, Contingency, and Emergency (PACE) planning model.

PACE Planning Model: A Framework for Reliable Communication

The PACE planning model helps ensure that communication remains operational, even when the primary method fails. It consists of:

- Primary (P). The primary communication method is the most reliable and preferred means of communication. For hams, this typically refers to the most established frequency or communication mode used under normal circumstances, such as a dedicated repeater or a reliable local frequency.
- Alternate (A). The alternate method is a backup communication option used when the primary process is unavailable or unreliable. This could involve switching to a different frequency or using a different mode of communication, such as digital or simplex.
- Contingency (C). The contingency method comes into play when both the primary and alternate methods fail. This could include using different frequencies, satellite communication systems, or alternative long-distance communication available to hams.
- Emergency (E). The emergency method is a last resort. This could include physical message delivery, voice communications using improvised equipment, or relying on local, informal networks.

The PACE model is essential in disaster scenarios because it ensures that communication systems are not overly reliant on a single method of transmission. In having multiple communication options, the model increases the chances that a reliable communication link can be maintained, even when parts of the infrastructure are compromised.

Incorporating the PACE model into EmComm training would equip operators with a structured approach to managing communication failures.

Integrating PACE and Ham Radio into ICS and AUXCOMM

ICS and AUXCOMM must be critical components of modern emergency management frameworks. Integrating ham radio support into ICS and AUXCOMM ensures that amateurs are effectively incorporated into the broader emergency management system. By adopting the PACE model within the context of ICS and AUXCOMM, the following advantages can be realized:

- Clear role definition. By embedding hams into ICS and AUXCOMM, the duties of each operator are clearly defined within the overall command structure.
- Standard Operating Procedures (SOPs). Standardizing the use of the PACE model within ICS and AUXCOMM enables the creation of clear, documented SOPs for hams.
- Improved coordination with other responders. ICS promotes interoperability between emergency responders. When hams are trained in ICS and familiar with its protocols, they are better equipped to communicate effectively with other agencies.
- Resource optimization. When using the PACE model within ICS and AUXCOMM, hams can avoid unnecessary frequency congestion, duplication of efforts, or communication bottlenecks.

ARES and AUXCOMM

Many hams are already trained through the ARES program and have successfully served their communities for decades. Ultimately, it is up to the served agencies and organizations to determine what certifications they require for volunteers. The training ARES provides is similar to the AUXCOMM program in many ways, including tasks associated with what is expected of AUXCs and ACMs. ARES also provides an organizational structure through the national, district, Section, and local levels that helps coordinate hams and resources during times of need.

ARES has always been a solid foundation of EmComm, upon which a successful AUXCOMM program can be built. The basic requirements to be an ARES volunteer are easy enough to fulfill through having an amateur radio license and a heart of service, and they pair well with AUXCOMM training. However, AUXCOMM is designed to work with an ICS organization.

This makes the prerequisite Federal Emergency Management Agency Independent Study courses, which ARES recommends, a requirement for AUXCOMM training. Many operators are surprised to learn that AUXCOMM does not teach operational techniques and technical skills, but how to function within a standardized ICS organization. Having the AUXCOMM certification tells served agencies from the start that the volunteer communicators have the requisite skills.

A Coordinated Service

Hams have long played a critical role in EmComm, but the lack of standardized training and protocols has hindered their effectiveness in disaster response. By incorporating the PACE communication model and integrating with ICS and AUXCOMM, we can enhance amateur radio's coordination, reliability, and efficiency during emergencies. Standardizing training will equip operators with the necessary skills and ensure seamless integration into the broader incident management framework.

John Minard, W5JXN, has been an amateur radio enthusiast since first testing in 2016. Since retiring from the fire service at the rank of captain in 2018, he has been employed by the State of Arkansas as an emergency management instructor. This role has led to him teaching emergency management and similar classes in Arkansas and Oklahoma, including Communications Unit Leader and AUXCOMM. When not teaching, working toward his PhD in emergency management, or spending time with his nine (soon to be 10) grandkids, John enjoys experimenting with all aspects of amateur radio, with a special interest in emergency communications. He can be reached at **w5jxn@outlook.com**.

First licensed in 1991 as N5XFW, J. M. Rowe is an Amateur Extra-class operator who holds the position of ARRL Section Emergency Coordinator for Arkansas. He is the Chair of the Arkansas Information Communication and Technology Unit Working Group, the SHARES/AUXCOMM/ESF-2 (Communications) Liaison Officer, the Chair of the Region 4 (Arkansas) 700 MHz Planning Committee, a member of the Arkansas Wireless Information Network Executive Committee, an at-large member of SAFECOM, Co-Chair of the SAFECOM/NCSWIC AUXCOMM Action Team, and the Chair of the FEMA Region 6 AUXCOMM Committee. He holds a Master Instructor Certificate from the FEMA Center for Domestic Preparedness, and he teaches ICS-300, ICS-400, AUXCOMM, and COML. J. M. is responsible for all Arkansas Division of Emergency Management Auxiliary Communications. He can be reached at **n5xfw@yahoo.com**.

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ARES Celebrates 90 Years of Service

A legacy of resilient communication.

Scott Yonally, N8SY, ARRL
Great Lakes Division Director

For 90 years, the Amateur Radio Emergency Service® (ARES®), a program of ARRL, has stood as a pillar of support, providing crucial communication assistance during disasters and emergencies. This milestone anniversary marks 9 decades of selfless service, unwavering dedication, and a commitment to keeping communities connected when conventional communication channels falter.

An Amateur Radio Foundation

ARES volunteers are licensed amateur radio operators who dedicate their time, skills, and resources to ensure that vital information flows during crises. Their contributions are invaluable, bridging communication gaps and supporting emergency response efforts across the nation. ARES is a critical component of the emergency management landscape, working alongside organizations like the Federal Emergency Management Agency (FEMA), local emergency management agencies (EMAs), the Red Cross, and the Salvation Army.

The ARES network is built upon the foundation of amateur radio's technical capabilities and the unwavering commitment of its members. They stand ready to provide communications for damage assessment, relay health and welfare inquiries, and support logistical coordination when traditional infrastructure is either overloaded or nonexistent. ARES volunteers are unsung heroes, often operating behind the scenes, ensuring that emergency responders, government agencies, and the public receive the information they need to navigate challenging situations.

The seeds of ARES were sown in the early 20th century, out of recognition of the potential of amateur radio to provide emergency communications. Over the years, ARES has evolved alongside technological advancements, adapting to meet the ever-changing demands of emergency response. From its early days of using Morse code and vacuum tube technology to today's sophisticated digital modes and satellite communications, ARES has remained at the forefront of communication innovation.

The organization's long history includes providing critical support during countless natural disasters, including hurricanes, earthquakes, floods, and wildfires. ARES has also proven its value during man-made emergencies such as transportation accidents, infrastructure failures, and public safety incidents. This sustained record of service has solidified ARES's reputation as a trusted and reliable partner in emergency communication.

ARES's strength lies in its commitment to interoperable communications. ARES volunteers are proficient in a variety of communication modes, including traditional analog systems like 2-meter and HF radio, as well as modern digital technologies like DMR, D-STAR, Fusion, and P25. This versatility allows ARES operators to seamlessly integrate with existing communication systems used by various agencies and organizations.

ARES also leverages digital modes such as Winlink and packet radio for sending formal radiograms and vital data. These digital capabilities enhance the speed and accuracy of communication, reducing the potential for errors during critical information transfer. Furthermore, ARES operators are adept at utilizing handheld radios and portable repeaters, enabling them to establish communication networks in areas where infrastructure is damaged or non-existent.

ARES's effectiveness is amplified through its strong partnerships with various agencies and organizations. ARES collaborates with FEMA, EMAs, the Red Cross, the Salvation Army, local emergency planning committees, and other stakeholders to develop and implement emergency communication plans. These partnerships ensure that ARES is well integrated into the broader emergency response framework.

ARES collaborates with organizations such as SAFECOM and the Cybersecurity and Infrastructure Security Agency (CISA) to promote interoperable communication standards and enhance the security of communication networks. Additionally, ARES works with AUXCOM to foster collaboration and share best practices, thereby strengthening the nation's overall emergency preparedness and response capabilities.

A Collaborative Effort

ARES often works in conjunction with Radio Amateur Civil Emergency Service (RACES), a service established by the FCC. While ARES is a volunteer organization under ARRL, RACES is a government-sponsored communication service that utilizes amateur

radio operators during declared emergencies. Many ARES volunteers are also RACES members, allowing for a coordinated and efficient response during emergencies when activated by a government entity. This collaboration ensures that amateur radio resources are effectively utilized to support official emergency communication needs.

ARES places a strong emphasis on training and preparedness. ARES volunteers participate in regular drills, exercises, and training courses to hone their communication skills and stay up to date on the latest technologies and procedures. These training activities ensure that ARES operators are ready to respond effectively during real-world emergencies.

Preparedness is a cornerstone of ARES's mission. ARES volunteers are encouraged to maintain their own emergency communication kits, including radios, power supplies, and other essential equipment. They are also encouraged to develop personal emergency plans and to be self-sufficient for extended periods. This commitment to preparedness ensures that ARES operators can respond quickly and effectively when disaster strikes.

ARES plays a vital role in supporting emergency management efforts at the local, regional, and national levels. ARES volunteers provide critical communication support for damage assessment teams, helping to gather information about the extent of damage and the needs of affected communities. They also relay health and welfare inquiries, connecting families and providing reassurance during uncertain times.

ARES volunteers support shelters, distribution centers, and other critical facilities, providing communication links between these locations and emergency operations centers. They also assist with logistical coordination, ensuring that resources are delivered to where they are needed most. In many communities, ARES is an integral part of the local emergency response plan, providing a reliable communication lifeline when all other systems fail.

Selfless Service

As ARES commemorates its 90th anniversary, we celebrate not just a milestone, but the selfless service that has been the lifeblood of the organization for 9 remarkable decades. ARES volunteers are the embodiment of the amateur radio ethos, a blend of deep-rooted community service and invaluable technical expertise. They are dedicated individuals, drawn from all walks of life, united by a shared willingness to generously contribute their time, skills, and knowledge to assist others during their greatest times of need.

The slogan for the 90th anniversary of ARES indicates that ARES is a partner that is ready when the community is in need, that it responds quickly, and is resilient amid rapidly changing situations.

For 90 years, ARES volunteers have provided the vital communication link during emergencies, natural disasters, and public service events. Their contributions have made a tangible and profound difference in countless communities, saving lives by relaying critical information, providing essential communication support when conventional infrastructure fails or is nonexistent, and offering a beacon of hope during moments of crisis and uncertainty.

ARES's 90th anniversary is more than just a celebration of longevity; it's a testament to the enduring power of amateur radio and the unwavering commitment of its volunteers. It demonstrates the enduring relevance of a dedicated group of individuals who possess the technical skills and the unwavering spirit to serve. This milestone underscores the vital role amateur radio continues to play in supporting communities and bridging communication gaps during emergencies.

The Next Chapter

As ARES looks toward the future, it remains dedicated to its mission of providing indispensable communication support, empowering communities to better prepare for and respond to emergencies, and ultimately, saving lives.

The next chapter in ARES's history promises even greater innovation, enhanced collaboration with partner agencies, and a renewed commitment to service. This will ensure that ARES remains a vital and indispensable resource for emergency management professionals and the communities they serve, for generations to come. The legacy of service continues.

For more information on how to join an ARES group, visit **www.arrl.org/ares**.

Simulated Emergency Test 2024 Results

ARRL Field Organization
Supervisor Steve Ewald, WV1X

The 2024 ARRL Simulated Emergency Test (SET) gave amateur radio operators a great opportunity to put their training, plans of action, and working relationships with community organizations and government agencies to the test under simulated emergency conditions and scenarios. The results of the SET represent their efforts to be ready to respond when called upon.

Luzerne County SET Combined with Nuclear Drill 2024

Luzerne County Emergency Coordinator and PEMA Auxiliary Communications Officer David Kirby, N3SRO

Luzerne County Amateur Radio Emergency Service (LCARES) participated in the 2024 federally evaluated Susquehanna Steam Electric Station (SSES) drill on October 22. Voice and digital capabilities were tested between the Luzerne County Emergency Operations Center (EOC) in Wilkes-Barre, Pennsylvania, and various radio single resources located at multiple municipalities within the emergency planning zone. VHF repeaters were successfully used for voice communications and to transmit SSES, Pennsylvania Emergency Management Agency (PEMA), and Incident Command System (ICS) forms digitally.

HF voice and data communications were also successfully utilized between the EOC, PEMA Auxiliary Communications Service (ACS), and Eastern Pennsylvania Section leadership. Telemetry (position and weather) was also utilized using the county's available automatic packet reporting system (APRS).

Event Summary

Thirty-four individuals participated, including 28 field operators and six operators at the Luzerne County EOC. All municipalities in Luzerne County had an Amateur Radio Emergency Service®/Auxiliary Communications (ARES®/AUXCOMM) operator present.

LCARES was activated at 12 PM local time via a Team App push notification. The Incident Radio Communications Plan (ICS-205), Procedure C (an LCARES activation procedure), and assigned stations were sent out with the push notification. The net opened at 5:45 PM local time on the 146.61 MHz repeater located on Penobscot Mountain in Maine and the 146.46 MHz repeater located in Mountain Top, Pennsylvania.

Dallas County (Iowa) ARRL Emergency Coordinator Dan Case, KØWOI, operated as the Net Control Station from the Dallas County EOC during the 2024 SET on October 26. During the exercise, the Dallas County ARES group tested the reliability of amateur radio communications via the Perry 145.190 MHz repeater and simplex from the EOC to 13 shelter locations throughout the county. APRS was used at each shelter to track mobile stations participating in the net. Communication was also established between the Dallas County EOC and amateur radio stations in several communities in surrounding counties. [Dan Case, KØWOI, photo]

Eastern Pennsylvania Section ARES leadership was informed of the drill activation via the HF circuit — first, through the Eastern Pennsylvania Emergency Phone and Traffic Net on 3.918 MHz. The second notification method was the W3LUZ Winlink station, where a circuit was made on the 80-meter band (3.5 MHz) to a radio message server gateway station outside of the county.

The PEMA ACS was also activated for the drill. Two-way communications were established with PEMA headquarters through the HF circuit and the PEMA Digital Mobile Radio Talkgroup. The HF circuit was made with PEMA headquarters on 7.2505 MHz.

Each operator acted as a single resource team, checked in upon arrival at their designated location, and alerted the county EOC when they were ready to send and receive messages. The messages were transmitted from the EOC over the repeater using the *fldigi* program suite. This program allows us to input form data using the HTML format, transmit it over the air in approximately 60 – 90 seconds, depending on the size of the form, and then print the form in its original format. This entire process takes less than 5 minutes.

During the drill, each operator interfaced directly with emergency managers and Talen Energy officials at their assigned municipalities. The ICS was utilized for the duration of the drill. There were FEMA, PEMA, and Talen Energy officials evaluating the drill at the municipalities, including the county EOC.

In-house VHF APRS and HF voice and digital communications were tested as well. VHF APRS utilized local digipeaters to track operators' positions and local weather in the field. HF voice operations were used to check into the Eastern Pennsylvania Emergency Phone and Traffic Net and the PEMA ACS Net to simulate requesting resources outside of the affected area, from the county EOC to PEMA and Eastern Pennsylvania Section leadership.

Overall Observations and Comments

Overall, the exercise was deemed an overwhelming success. Nearly two-thirds of our LCARES registrants participated. Five operators from ARES teams from outside Luzerne County volunteered. Several operators also volunteered from the University of Scranton Amateur Radio Club, W3USR. This is clearly a testament to the dedication and camaraderie amongst the emergency communications units throughout the Eastern Pennsylvania Section.

We passed all SSES forms to the municipalities in a timely fashion. APRS was utilized to visibly track our operators on a map and message them in the field without any infrastructure available.

HF Winlink messaging can send emails and messages directly over a radio frequency to command staff at the EOC or to allow timely communications to resources outside the affected area when commercial infrastructure has been compromised.

LCARES has demonstrated that it can provide the emergency management agency and Talen Energy with emergency communications services.

Lyon County ARES in Search and Rescue SET

Lyon County ARRL Emergency Coordinator Patricia Polish, KE7JIV

Lyon County ARES (also LCARES) in Nevada participated in the 2024 SET on November 2, from 6:00 AM to 5:00 PM local time. Six members took part in the exercise. This SET supported the efforts of a training exercise with the Lyon County Sheriff's Search and Rescue (LCSSAR) and the Navy's Rotary Wing Weapons School.

The Navy simulated a crash site in which 17 Seahawk Weapons and Tactics Instructors (SWITIs) in three helicopters were shot down by hostile Lyon County forces and crashed into the Pine Nut Mountains in Nevada. The SWITIs' goal was to reach friendly forces to the east of the crash site. LCSSAR deputies were ordered to seal off the crash site and capture the surviving aircrew. LCSSAR used four-wheel-drive vehicles, all-terrain vehicles, unmanned aerial vehicles, and man-tracking teams. This required good communications over a 7-mile distance in mountainous terrain. As communications are spotty in the exercise area, the LCARES team was asked to help facilitate communication for the LCSSAR team and the SWITIs.

2024 SET Top Ten

Section	Points
ARES Activity	
Alabama	2,213
Colorado	1,454
Michigan	1,449
Western Washington	1,422
Southern New Jersey	1,164
Maine	1,064
Eastern New York	1,054
Western New York	524
Missouri	522
Eastern Pennsylvania	505
Section/Local Nets	
Wisconsin	4,932
Alabama	944
Michigan	696
Georgia	274
Eastern New York	220
East Bay	184
Colorado	180
Western New York	171
Missouri	135
Ohio	87

ARES Groups in Alabama Prepare with Served Agencies

Montgomery County ARRL Emergency Coordinator Otto Arnoscht, N4UZZ

ARES of Montgomery County, Elmore County, and Autauga County in Alabama conducted a joint communications exercise on October 5, 2024, from 8:00 AM to 1:00 PM Central Time. This exercise involved voice and digital message traffic between hospitals, the Montgomery and Elmore County EOCs, the American Red Cross, and operators throughout Montgomery and Elmore Counties. The exercise was designed to practice emergency communications between public safety agencies and important institutions when electricity, cellular service, and internet have failed due to a catastrophic weather event. "The entire county communications system is built on P25," explained Montgomery County/City joint Emergency Management Agency Director Wayne Lyles. "We need amateur radio [as a] backup in the event the entire system goes down. Ham radio operators have the expertise and equipment to maintain communications. This exercise makes sure that they are ready."

In Central Alabama, we are vulnerable to hurricanes with spin-off tornadoes. These weather events can bring down cell phone and radio towers and prevent

them and the internet from working. During those times, hospitals need to coordinate, and public service agencies need to assess what is going on. They need to communicate to do that effectively. We are there to provide that communication. ARES also provides trained volunteers for searches and other public safety agency needs.

ARES Activity

Area	Reporter	Points	Section Points
Atlantic Division			
Eastern Pennsylvania			505
Luzerne	N3SRO	391	
Montgomery Co.	W3AFV	114	
Maryland/DC			94
Montgomery Co.	KN3U	94	
Southern New Jersey			1,164
Section-wide	WB2ALJ	597	
Cumberland Co.	N2MHO	169	
Mercer Co.	WJ3P	159	
Ocean Co.	WX2NJ	155	
Camden Co.	WB9ULP	84	
Western Pennsylvania			334
Beaver Co. #2	N3EJL	245	
Beaver Co. #1	N3EJL	89	
Western New York			524
Ontario Co. #2	KC2DKP	203	
Ontario Co. #1	KC2DKP	177	
Monroe Co.	N2JAC	144	
Central Division			
Indiana			256
Monroe Co.	KC9RPX	173	
Tippecanoe Co.	KP4CI	54	
Clark Co.	KB9OIC	29	
Wisconsin			382
Ozaukee Co.	KD9UWG	76	
Dunn Co. #2	KB9MMT	166	
Dunn Co. #1	K9BRM	140	
Dakota Division			
Minnesota			25
Carlton Co.	KCØAFE	25	
Delta Division			
Louisiana			694
Region 6	WB5JZP	69	
Tennessee			488
Williamson Co.	KC1DWP	394	
Rutherford Co.	KN4CCQ	61	
Dickson Co.	ND4N	33	
Great Lakes Division			
Michigan			1,449
Wayne Co.	NXØH	233	
Saginaw Co.	KC8YVF	179	
District 5	KD8RHP	142	
Marquette Co.	N8NAV	124	
Muskegon Co.	K8COP	118	
District 6	N8UKH	108	
Emmet	W8NWO	107	
Chaboygan Co.	W8NWO	105	
Charlevoix Co.	W8NWO	105	
Luce	K8PDC	86	
Alger Co.	KD8ZYW	76	
Delta Co.	NJ9V	33	
Gratiot Co.	NO8V	33	
Ohio			388
Montgomery Co.	KA8RUC	158	
Geauga Co.	N8ONI	152	
Fairfield Co.	KE8CVP	78	
Hudson Division			
Eastern New York			1,054
Warren, Washington Co.	KD2BVA	626	
Orange Co.	KC2VTJ	227	
Sullivan Co.	KN2X	85	
Rockland Co.	N2GOP	63	
Westchester Co.	KD2OFD	53	
Midwest Division			
Iowa			218
Dallas Co.	KØWOI	140	
Fayette Co.	NØZJT	78	
Kansas			234
Leavenworth Co.	NJØP	234	
Missouri			522
St. Charles Co.	NØPNP	277	
Boone Co.	NØAXZ	245	
New England Division			
Connecticut			107
Region 5 — Town of Brookfield	W1QK	107	
Maine			1,064
Washington Co.	N1EP	317	
Cumberland Co.	KB1HNZ	285	
Penobscot	K1CMN	121	
Somerset Co.	KS1SI	121	
Waldo Co.	KC1LKI	116	
Aroostook Co.	KC1ECV	79	
Oxford Co.	N1YIS	25	
Northwestern Division			
Alaska			133
Interior Alaska	AD7VV	133	
Eastern Washington			107
Klickitat Co.	W7GRH	107	
Western Washington			1,422
Pacific Co. #1	N7CVW	488	
Pacific Co. #2	N7CVW	417	
Clark Co. #2	AE7GQ	392	
Clark Co.#1	AE7GQ	125	
Pacific Division			
Santa Clara Valley			200
Coastside of San Mateo Co.	KI6FAO	122	
San Benito Co.	N6HKT	78	
Roanoke Division			
Virginia			191
Fauquier Co.	KD6AKC	108	
York Co.	WB4UHC	83	
South Carolina			108
Dorchester Co.	W3BRB	108	
Rocky Mountain Division			
Colorado			1,454
Region 9	NØWKR	237	
Larimer, Weld Co.	KA6ETE	219	
Adams, Arapahoe Co.	KD6UFO	215	
Douglas, Elbert Co.	K8ZTT	207	
Region 5, District 2	WBØYKO	136	
Region 8, District 1	KIØKY	133	
Region 6, District 1	NØHQD	118	
Denver	KCØVAQ	104	
Region 10, District 3	KEØGVY	85	
Southeastern Division			
Alabama			2,213
Madison Co.	KK5H	933	
Montgomery Co.	N4UZZ	384	
Baldwin Co.	K4EES	345	
Colbert, Franklin, Lauderdale Co.	KE4QID	186	
Cross County	W5ARS	139	
Marshall	KD4BJW	123	
Limestone	K4AYK	103	
Georgia			198
Cherokee Co.	W1JKU	198	
West Gulf Division			
Oklahoma			181
Rogers Co.	KBØZTX	181	

Section/Local Nets

Area/Net Name	Net Mgr	Points	Section Points
Atlantic Division			
Western New York			171
Ontario Co. #2	WB2VMR	94	
Ontario Co. #1	WB2VMR	77	
Central Division			
Indiana			63
Monroe Co.	KC9RPX	34	
Tippecanoe Co.	KP4CI	29	
Wisconsin			4,932
Dunn Co. #2	KC9FXE	3,361	
Dunn Co. #1	KC9FXE	1,537	
Ozaukee Co.	KD9UWG	34	
Delta Division			
Arkansas			54
Cross Co.	W5ARS	54	
Louisiana			36
Vernon Parish	WB5JZP	36	
Tennessee			31
Dickson Co.	N4JSB	31	
Great Lakes Division			
Michigan			696
Saginaw Co. #2	KC8YVF	231	
Monroe Co.	KE8BYC	168	
WCARPSC	K8AGY	128	
Saginaw Co. #1	KC8YVF	50	
Gratiot Co.	N8DXR	37	
Muskegon Co.	K8EOD	28	
Ohio			87
Miami Co.	WB8PMG	87	
Hudson Division			
Eastern New York			220
Warren, Washington Co.	KE2AGV	220	
Midwest Division			
Iowa			64
Dallas Co.	KØWOI	64	
Missouri			135
Boone Co.	NØAXZ	135	
Pacific Division			
East Bay			184
Solano Co.	KM6BXZ	184	
Rocky Mountain Division			
Colorado			180
Larimer, Weld Co.	KA6ETE	129	
Pueblo, Huerfano Co.	WBØYKO	51	
Southeastern Division			
Alabama			944
Madison Co. #1	KM4CJ	298	
Madison Co. #2	KM4CJ	298	
AEN-J	KE4QID	110	
Limestone Co.	K4AYK	93	
Marshall Co.	KD4BJW	88	
Baldwin Co.	N4RAI	57	
Georgia			274
Cherokee Co. #2	W1JKU	160	
Cherokee Co. #1	WA4EOC	114	
West Gulf Division			
Oklahoma			80
Rogers Co.	AI5Q	80	

Sierra Harrop, W5DX, sharrop@arrl.org

Happenings

ARRL Files Comments Responding to FCC Request for Input

ARRL filed comments (**www.arrl.org/files/file/Advocacy/ARRL%2025-133%20Comments%2004_11_2025.pdf**) with the FCC in response to its request for public input on alleviating unnecessary regulatory burdens by deleting or modifying rules in the matter of "In Re: Delete, Delete, Delete" (**www.arrl.org/news/fcc-initiates-broad-inquiry-on-rules-to-delete-or-amend**). Implementing ARRL's suggestions would promote and protect the art, science, and enjoyment of amateur radio, and it would enhance the development of the next generation of radio amateurs.

In response to ARRL's request, more than 200 members submitted suggestions that were reviewed when considering what rules should be deleted or modified. ARRL will continue to engage with members and advocate for the Amateur Radio Service.

In its filing, ARRL asked the FCC to delete or amend the following rules:

Delete the LF and VHF/UHF Symbol (Baud) Rate and Bandwidth Limitations

ARRL supports the deletion of these restrictions, as proposed by the FCC in late 2023. Doing so would enhance amateur experimentation with digital technologies.

Update and Modernize Entry-Level Technician-Class License Privileges

ARRL reiterated its earlier proposal for extending additional limited privileges for Technician-class operators. Adopting its proposal would provide new licensees an introductory window to HF data and phone communications that are at the core of the amateur radio experience. It would also serve to incentivize the next generation of technical leaders, just as Novice CW HF privileges did for earlier generations of operators.

Modernize 80/75-Meter Subband Divisions

ARRL requested action on an earlier proposal that would make more efficient and intense use of the 80/75-meter band. Changes in technology and modes since band usage was last addressed have resulted in overcrowding in one band segment, which would be alleviated by adoption of ARRL's proposal.

Delete and Replace Obsolete Digital Code Limitations

ARRL asked the FCC to remove provisions that refer to digital codes that are obsolete and permit radio amateurs to experiment freely with new digital codes, so long as such codes are publicly documented and decodable over the air.

Implement Changes to Third-Party Rules Adopted Internationally at WRC-03

Although the US fully supported changes to the International Telecommunication Union Radio Regulations in 2003 that removed a treaty requirement for third-party messages, there is no record of this change having been considered, and the FCC's rules were never conformed to the new provision. Being the only nation known to continue to require a formal treaty for such purposes has resulted in no new such treaties since the treaty changed more than 2 decades ago. Thus, ARRL asked the FCC to implement rules that are consistent with those internationally agreed to align with the rest of the world.

Delete Amplifier Drive Limitation

ARRL requested that the FCC act favorably on a pending proposal to remove limits to HF amplifier gain that add to amateur equipment cost and impede use of new efficient amplifier technology.

Remove Non-Current Personal Information in Amateur ULS Records

ARRL requested that the FCC complete a rulemaking, in which it proposed to have only current licensee information visible in the public (Universal Licensing System) database. Right now, if an amateur changes their address to a Post Office Box to shield their home address, the previous address remains visible. ARRL advocates for protecting the privacy of radio amateurs.

Delete Obsolete Identification Requirement for Special Call Signs

Users of special event call signs are required to identify with the FCC-issued responsible call sign at least once each hour. This can be confusing, especially on data and CW modes. ARRL proposed reliance on the web-

based database that clearly identifies each special event call sign and authorized period of use.

Delete Obsolete Paper License Replacement Provision

The FCC no longer mails physical copies of amateur radio licenses, so ARRL suggested deleting the rule that provides for sending paper replacements.

The FCC notice (**https://docs.fcc.gov/public/attachments/DA-25-219A1.pdf**) generated a lot of interest among radio amateurs, with hundreds submitting comments directly to the FCC, as well as responding to ARRL's request for suggestions.

The FCC deadline for filing reply comments was April 28, 2025.

As of press time, it is hoped that the FCC will incorporate worthy suggestions in a Notice of Proposed Rulemaking later this year. At that time, there will be a new opportunity for public comment on the specific rules that the FCC proposes to delete or modify.

Amateur Radio Helps 2025 Boston Marathon

More than 280 amateur radio operators volunteered during the 129th running of the Boston Marathon on April 21, 2025.

Operators were working at virtually every location connected with the race, including the starting line, the finish line, transportation points, and various operation centers, such as the Massachusetts Emergency Management Agency, the State Emergency Operations Center Unified Command Center, and the Boston Athletic Association Race Operations Center.

Combined, they performed communication duties that included logistics support as a primary function. Operators also provided backup support for medical and other public safety requests as needed.

"This is one of the largest public service events amateur radio supports in the US, and planning started over 6 months in advance," said Rob Macedo, KD1CY, of the Boston Athletic Association Communications Committee.

Amateur radio volunteers work the course net control location at the 2025 Boston Marathon. [Nancy Austin, KC1NEK, photo]

Rob Macedo, KD1CY, at the State EOC Unified Command Center. [Rob Macedo, KD1CY, photo]

Heritage CQ Amateur Radio Hall of Fame Inductees Named

The Heritage *CQ* Amateur Radio Hall of Fame, created by longtime amateur radio publisher Richard Ross, K2MGA (SK), will continue to honor hams in a new section of the hamgallery.com website.

CQ magazine ceased publication in October 2023. Ross died on April 27, 2024, and the change was made with the permission of his widow, Cathy.

The Heritage *CQ* Amateur Radio Hall of Fame honors licensed amateur radio operators and non-licensed individuals who have made significant contributions to amateur radio, their professional careers, or another aspect of world affairs. A select and diverse group of amateurs will administer the new web page and review submissions.

The 2025 inductees are:

Professor Jim Breakall, PhD, WA3FET. Dr. Breakall's work has been instrumental in amateur radio antenna technology development for decades. Dr. Breakall has

authored numerous peer-reviewed scientific articles and books. He is an Institute of Electrical and Electronics Engineers (IEEE) Life Fellow and a Radio Club of America (RCA) Fellow. He has been awarded the IEEE David Sarnoff Award, the RCA Dr. Ulrich L. Rohde Award for Innovation in Applied Radio Science and Engineering, and the Dayton Hamvention® Technical Achievement Award.

Angel M. Vazquez, WP3R. Vazquez graduated from the City University of New York. He worked at WNYC as a radio engineer before moving back to Arecibo, Puerto Rico, and taking a job at the Arecibo Observatory in 1977. While there, he became the head of telescope operations. He has presented numerous talks on the Arecibo Observatory and his amateur radio experiences at the Dayton Hamvention antenna forums, the RCA Speaker series, Ham Radio Science Citizen Investigation conventions, and multiple amateur radio clubs around the world. He was named Puerto Rico Amateur of the Year in 2017.

Wayne Overbeck, PhD, N6NB (SK). Dr. Overbeck was co-inventor of the Quagi antenna, which is part quad, part Yagi. He was active in amateur radio for more than 68 years, and he was a communications law professor and textbook author, as well as an accomplished DXer and contester.

The nomination deadline for 2025 has passed, but more information about nominating procedures can be found at **www.hamgallery.com/HOF/AmateurRadio/procedure.htm**.

Section Manager Nomination Notice

To all ARRL members in Alabama, Alaska, Delaware, East Bay, Kansas, Michigan, New Mexico, Santa Barbara, Tennessee, and Western Massachusetts. You are hereby solicited for nominating petitions pursuant to an election for Section Manager (SM). Incumbents are listed on page 16 of this issue.

To be valid, a petition must contain the signatures of five or more full ARRL members residing in the Sections concerned. It is advisable to have a few more than five signatures on each petition. A sample nomination form is available on the ARRL website at **www.arrl.org/section-terms-nomination-information**. Nominating petitions may be made by facsimile or electronic transmission of images, provided that upon request by the Field Services Manager, the original documents are received by the manager within 7 days of the request. It is acceptable to submit signatures that have been sent via email or mail under the following guidelines: The petition copies must be made from the original form supplied by ARRL or downloaded from the ARRL website. The form must be exactly the same on both sides (i.e., autobiographical information should appear exactly the same on all copies). All forms/copies must be submitted together.

Candidates may use any of the available electronic signature platforms such as DocuSign, Dropbox Sign, and Signed PDF. Candidates who use an electronic signature platform to be nominated, as described above, do not have to send the original paper copies of the nominating documents. The packet that is sent to ARRL Headquarters must be complete. Multiple files or emails for a single petition will not be accepted.

We suggest the following format:

(Place and Date)

Field Services Manager, ARRL

225 Main St.

Newington, CT 06111

We, the undersigned full members of the _____ ARRL Section of the _____ Division, hereby nominate _____ as candidate for Section Manager of this Section for the next 2-year term of office.

(Signature _____ Call Sign _____ City _____ ZIP _____)

Any candidate for the office of Section Manager must be a resident of the Section, an amateur radio licensee of Technician class or higher, and a full member of ARRL for a continuous term of at least 2 years immediately preceding receipt of a nominating petition. Petitions must be received at Headquarters by 4:00 PM Eastern Time on September 5, 2025. If more than one member is nominated in a single Section, ballots will be mailed from Headquarters no later than October 1, 2025, to full members of record as of September 5, 2025, which is the closing date for nominations. Returns will be counted November 18, 2025. Section Managers elected as a result of the above procedure will take office January 1, 2026.

If only one valid petition is received from a Section, that nominee shall be declared elected without opposition for a 2-year term beginning January 1, 2026. If no petitions are received from a Section by the specified closing date, such Section will be resolicited in the January issue of *QST*. A Section Manager elected through the resolicitation will serve a term of 18 months. A Section Manager vacancy occurring between elections is filled through appointment by the Field Services Manager. — *Mike Walters, W8ZY, Field Services Manager*

Because no nomination petitions were received for the New Hampshire Section Manager election by the nomination deadline of March 7, 2025, nominations are hereby resolicited. See above for details.

Call for Nominations for ARRL Director and Vice Director

Attention: Full ARRL members in the Pacific, Rocky Mountain, Southeastern, Southwestern, and West Gulf Divisions. You have the opportunity to choose a Director and Vice Director to represent you for a 3-year term beginning January 1, 2026.

ARRL is governed by its Board of Directors. A voting Director is chosen by ballot by the full (licensed) ARRL members in each of its 15 Divisions. Vice Directors who serve in the absence of the Director at a Board meeting and succeed to the position of Director should a vacancy occur are chosen at the same time. Elections are held in five Divisions per year. It takes only 10 full members in a Division to nominate a candidate for either office.

Qualifications

The eligibility of nominees for the positions of ARRL Director and Vice Director will be reviewed by the Ethics & Elections Committee, composed of three Directors not subject to election this year: Scott Yonally, N8SY; Brent Walls, N9BA, and Tom Frenaye, K1KI. A nominee must be at least 21 years old and must have been licensed and a full member of ARRL for a continuous term of at least 4 years immediately preceding nomination. Each nominee must provide information concerning their employment, ownership, investment interests, and other financial arrangements to ensure compliance with the Conflict of Interest Policy (see Article 12 of the ARRL *Articles of Association and Bylaws* 18 – 24), available at **www.arrl.org/general-information**. The qualifications for Director and Vice Director are identical. All the powers of the Director are transferred to the Vice Director in the event of the Director's resignation, recall, move outside the Division, inability to serve, or death.

Nomination Procedure

Step 1: Obtain official nominating petition forms. Starting July 1, any full member residing in a Division where there is an election may request an official nominating petition package in writing, either by letter or via email, to **execadmin@arrl.org**. The request must reach the ARRL Secretary *no later than noon EDT on Friday, August 8, 2025.* If you are seriously considering running or nominating someone to run, please don't wait until the last minute to request the forms; the deadline for submitting a completed petition form is just 1 week later.

Step 2: Complete the questionnaire and obtain signatures. Only the official form may be used. The candidate must complete the questionnaire, provide the information required to determine eligibility, certify its accuracy, and agree to assume the office if elected and to abide by all ARRL Articles of Association, Bylaws, and Governing Documents. To be valid, a nominating petition must name the candidate and must bear the wet (non-electronic) signatures of 10 full members of the Division.

Step 3: Submit the petition form. The completed form must reach the Secretary *no later than noon EDT on Friday, August 15, 2025.* The submission may be made by electronic transmission of images (i.e., a PDF or JPEG attachment to an email) or facsimile provided that upon request, the original documents are received by the Secretary within 7 days of the request. A person who is nominated for both Director and Vice Director may choose to decline the nomination for Director; otherwise, the nomination for Director will stand and that for Vice Director will be void.

Balloting

If there is only one eligible candidate for an office, he or she will be declared elected by the Ethics & Elections Committee. If there is more than one eligible candidate for an office, the full members in that Division who are in good standing as of September 10, 2025, will have the opportunity to cast ballots. Official voting documents will be mailed and emailed to members who are eligible to vote no later than October 1, 2025. Votes must be electronically cast, or completed paper ballots must be received at the designated PO Box in the envelope provided, by noon Eastern Time on Friday, November 21, 2025. The candidate receiving the most votes will be declared the winner that day.

Absentee Ballots

A full member who is residing temporarily outside his or her home Division, including overseas, may arrange to vote in the home Division by notifying the Secretary before September 6, 2025, giving their current mailing address as reflected in the ARRL membership records (i.e., *QST* mailing address) and the reason that another Division is considered home. Members with overseas military addresses should take special note of this provision; in the absence of information received to the contrary, ballots will be sent to them based on their postal addresses.

The Incumbents

The incumbent Directors and Vice Directors, respectively, in the five Divisions in which elections will be held this year are:

Pacific: Tony Marcin, W7XM, and John Litz, NZ6Q

Rocky Mountain: Jeff Ryan, KØRM, and Dan Grady, N2SRK

Southeastern: Mickey Baker, N4MB, and Andy Milluzzi, KK4LWR

Southwestern: Dick Norton, N6AA, and Ned Stearns, AA7A

West Gulf: John Robert Stratton, N5AUS, and Lee Cooper, W5LHC

Rick Palm, K1CE, k1ce@arrl.net

Public Service

The ATV and ARES Connection in Boulder, Colorado

EOC staff watching a BCARES live video feed of a Boulder County forest fire in 2022. [Allen Bishop, KØARK, photo]

In 1976, a massive downpour flooded the Big Thompson Canyon in Colorado, with more than 150 fatalities recorded. Agency staff had very few radios, so hams provided emergency communications on an ad hoc basis. In the aftermath, the Boulder County Sheriff's Office Civil Section called on the three ham clubs in the area to organize the Boulder County Amateur Radio Emergency Services® (BCARES) as a joint ARES®/Radio Amateur Civil Emergency Service (RACES) program. There was an amateur radio television (ATV) repeater in operation by the end of the 1970s, but RFI from an FM broadcast station at the repeater site resulted in dormancy during the '80s.

In 1989, Captain Bill McCaa, KØRZ, of the Boulder County Sheriff's Office, asked BCARES to provide the office with amateur television and an ATV repeater. The hardware and antennas were hosted on the sheriff's radio repeater site.

Around 1990, when the Gulf War began, there was a breakout of large anti-war protests. The Boulder Police Department wanted television imagery of the courthouse, which was a hub for protester activity, so they gave handheld TV camcorders to ARES operators. The major supplier of ATV equipment during that era (up to 2014) was Tom O'Hara's, W6ORG, PC Electronics (**www.hamtv.com**).

Over the years, camcorders were deployed for many holidays and events that required major police activity, including Halloween, political events, riots, etc. Officials wanted ATV cameras placed on rooftops for use during these times.

In 1995, the University of Colorado (CU) campus police department wanted television monitoring of home football games. Four ATV cameras and 70-centimeter ATV video transmitter pack sets were purchased and provided for public safety. The Boulder County Special Weapons and Tactics (SWAT) team wanted imagery too, but ARES leadership was concerned with the safety of its members for such an application. However, Jack Ciaccia, WMØG, and Jim Andrews, KH6HTV, agreed to become volunteer members of the Boulder County SWAT team. They set up perimeters at crime scenes and received imagery of SWAT situations, providing live transmissions to a mobile command

Noteworthy Dates in ATV and BCARES History

1976 — BCARES was founded after the Big Thompson River Flash Flood.

1989 — Captain Bill McCaa, KØRZ, of the Boulder County Sheriff's Office asked BCARES to provide TV service, starting with coverage of numerous anti-war activities.

Early 1990s — BCARES was activated to set up TV cameras on rooftops overlooking the crowds celebrating Halloween on the Boulder city pedestrian mall on Pearl Street. More than 40,000 people filled the mall.

1995 — CU's police department requested BCARES ATV coverage of home football games, so BCARES supplied four TV camera teams transmitting simultaneous pictures on four 70-centimeter, 6 MHz TV channels to the police command post.

1997 — A small subunit of up to four specially trained volunteer BCARES members became part of the Boulder County SWAT team to assist with ATV. SWAT teams were called during an out-of-control student riot one night, so BCARES was activated, and TV cameras covered the streets and rooftops.

2010 — BCARES provided video coverage from mountaintops during the Fourmile Canyon Fire and was credited by the sheriff for saving several homes.

2015 — BCARES adopted HD 1080p DATV and converted their ATV repeater to digital.

2018 — The DATV repeater was moved to the National Center for Atmospheric Research, where it remains today. The WØBTV DATV repeater has wide-area coverage.

post. They also trained at Fort Carson, an army post where live fire ranges simulated armed conflict.

A Prominent Figure in ATV Developments

Andrews soon became a household name of ATV as he began to design and build television hardware for ARES public service applications. In September 2010, his ATV systems were used to support firefighting efforts during the Fourmile Canyon Fire in which more than 6,000 acres burned, destroying 168 homes. BCARES members were activated for an entire week at the emergency operations center (EOC), evacuation centers, and mountaintops. ATV cameras with long telephoto lenses were employed to monitor the fire, streaming live video to monitors at the EOC. If a place of interest developed, a compass heading would be taken so fire control assets could be deployed efficiently. The operation was credited for saving six homes, and BCARES received a commendation for their work.

In the aftermath of the fire, several members of one of the area clubs asked Andrews to build ATV transmitters for them, and he started KH6HTV Video (**www.kh6htv.com**). He continued to develop hardware for the mode, especially with solutions for ARES television operations.

ATV in the Field

Over the years, radio amateurs have used ATV to observe many forest fires, including the Cal-Wood Fire in 2020. The Boulder ATV repeater, WØBTV, was used to transmit views of the fire, which burned 600 acres of Boulder's mountaintops. Using a telephoto lens, Andrews', KH6HTV, camera was able to view the fire along the Front Range as it approached the first ridge of the Rocky Mountain foothills. Television images were received at the BCARES command post in the county's EOC, where they were displayed on a large-screen monitor.

However, BCARES's biggest technical achievement was providing services to the US Department of Homeland Security for a BOLDERBoulder 10K run after the Boston Marathon bombing, as there was concern there might be a copycat bomber. BCARES provided television imagery using four cameras at the start line and four cameras at the finish line in the CU football stadium. Using all eight 70-centimeter ATV transmitters with only four ATV channels available was accomplished by using an intermediate portable ATV repeater that was set up on Flagstaff Mountain. Combined quad images were then relayed via two 23-centimeter FM-TV links to the two command posts.

Future of ATV in ARES

In its early days, the cost of digital television (DTV) was prohibitive to most hams. However, by 2014, 5 mW DTV modulators finally became price-accessible, and BCARES deployed a demo DTV system at a CU football game. The CU police chief reveled in the dramatic increase of image quality — high-definition (HD) 1080p — and provided BCARES with $10,000 to convert the old analog systems to the newer digital mode.

Andrews said that the DTV repeater has been the key to success for an active TV group. Today, there are more than a dozen DATV operators getting on the repeater for weekly nets. "Repeater access and experience are keys to successful and productive ARES deployments," Andrews said. More than half of the members of BCARES have been instructed on how to run the cameras and have been trained on picking up equipment from the 911 cache and setting it up in the field.

Maria Somma, AB1FM, ab1fm@arrl.org

Exam Info

ARRLVEC Volunteer Examiner Coordinator

ARRL VE Teams — Go Digital in 2025!

In 2025, the ARRL Volunteer Examiner Coordinator (VEC) is moving to a completely digital program. Printed booklets and supply shipments will be discontinued as we shift teams to the ExamTools exam system for online or printed amateur radio exams.

ARRL VEC Program Available Services

Online Exams or Printed Exams

ARRL Volunteer Examiner (VE) teams can go completely electronic by using the ExamTools system (**www.exam.tools**) to administer online exams for in-person or remote video-supervised sessions. Teams can also print exams for their in-person sessions from this web-based program.

Remote Video-Supervised Sessions

Remote sessions are conducted using an online video conferencing platform with ExamTools on-screen tests (**www.exam.tools**).

Electronically File Exam Sessions to the VEC

Upload exam session documents or files for quicker service! New and upgraded licenses are transmitted to the FCC within 1 – 2 business days for weekend sessions, and they are usually transmitted on the same day for weekday sessions. Contact the VEC department for the upload instructions at **vec@arrl.org**.

Additional information about these services is located on the Resources for VEs web page at **www.arrl.org/resources-for-ves**.

ExamTools Examination System

Since June 2020, our VE teams have been shifting to the ExamTools system, which works well for online and printed exams. VE teams can use printed exams from ExamTools, or they can opt for online exams at in-person sessions or fully remote, video-proctored sessions.

ExamTools offers four options for conducting exam sessions:

1. Remote, video-supervised test sessions with online exams.

2. In-person test sessions with online exams.

3. In-person hybrid test sessions with some online exams and some paper exams.

4. In-person test sessions with all ExamTools-generated paper exams (with automated grading), or paper exams that will line up with our grading templates.

As mentioned in option number four, VE teams have two choices in ExamTools regarding printed exam grading, if they want to continue using paper exams (**https://docs.exam.tools/docs/cve/printedexamcreation**).

VEs can create printed exams that utilize GradeCam™ for grading tests. GradeCam will grade exams in seconds using the camera on a phone, tablet, or computer, which eliminates the need to manually grade the tests. Additionally, the score will automatically be recorded in ExamTools for each test.

VEs can also choose to print exams that align with our blue overlay grading templates, allowing teams to continue using compatible paper tests during exam sessions.

Regardless of the type of exam session that is managed through the system, the program offers registering and tracking candidates throughout the session, automated grading for on-screen or paper exams, online signing of Certificate of Successful

Question Pools Schedule

Review of the question pools is part of a regular process.

Each question pool is reviewed and updated on a 4-year rotation.

The **Technician**-class (Element 2) Pool is effective as of July 1, 2022, and it is valid until June 30, 2026.

The **General**-class (Element 3) Pool is effective as of July 1, 2023, and it is valid until June 30, 2027.

The **Amateur Extra**-class (Element 4) Pool is effective as of July 1, 2024, and it is valid until June 30, 2028.

No question pools will be updated or released in 2025.

A new Technician-class question pool will be released in 2026.

The Technician Pool Review Is Here

The Technician-, General-, and Amateur Extra-class amateur radio question pool reviews are part of a regular process. Each question pool is reviewed and updated on a 4-year rotation and designed around standard subject matter, such as FCC rules, operating procedures, radio wave propagation, electrical principles, circuits, signals and emissions, antennas and transmission lines, and safety. All amateur radio exams are created from these pools.

No question pools are scheduled to be released in 2025. The Technician-class (Element 2) question pool is currently being reviewed. The National Conference of Volunteer Examiner Coordinators (NCVEC) Question Pool Committee (QPC) welcomes comments and suggestions for new questions or changes to the topic areas for any of the pools. Please send your input to the NCVEC QPC at **qpcinput@ncvec.org**. An updated Technician-class question pool will take effect on July 1, 2026, and you can help shape the next pool.

Completion of Examination (CSCE) forms and 605 forms by the candidate and examiners, logging and compiling session statistics and the VE participation list (test report summaries), and output files for uploading to the coordinating VEC. Additionally, as mentioned, the program will create printed exams that are compatible with our blue overlay grading template designs. The easy-to-use program helps VEs conduct a session and provides a comprehensive solution for conducting all types of exam sessions.

An overview of the ExamTools system is available at **https://docs.exam.tools/docs/general**.

ARRL VEC staff can also provide detailed information by email.

Reducing License Grant Times From Weeks to Days

All VE teams must submit their completed exam session results via our secure web page for quicker service to their candidates. The web page has been an available program service since 2018. New and upgraded licenses are transmitted to the FCC within 1 – 2 business days for weekend sessions, and they are usually transmitted on the same day for weekday sessions. Using the web page also reduces our return shipping expenses, as we have been covering the cost of shipping the administered sessions back to ARRL Headquarters. Uploading session results through our website is a vital program feature for our customers.

Looking Ahead to 2026 and Beyond

Moving VE teams to the ExamTools testing platform and to electronic session filing will allow for quicker service to candidates. The average wait time for a license grant has dropped to a few days instead of a few weeks (months when conducted by the FCC) for candidates who test with VE teams using these services.

Stronger results will be achieved by aligning with the expectations of our VE teams and examinees, reducing reliance on the US Postal Service and paper filings, and improving customer satisfaction through shorter license issuance wait times.

These strategies will help the VEC program remain strong and active in the amateur radio community. Our commitment to delivering a fast, easy, and affordable solution allows teams to speed up the FCC license grants for customers. Hopefully, it will give us traction to grow the amateur radio community more than ever.

The Technician-class exams will change on July 1, 2026. Therefore, our VE teams will be required to print the new exams from ExamTools if they wish to continue to use printed exams at in-person sessions. This will be the new procedure going forward, as we are no longer printing or shipping booklets from ARRL Headquarters. Teams will have to print new exams as question pools continue to update. We believe that a year should be enough time for everyone to learn the ExamTools system and decide what option works best for their team. We are here to provide any assistance that we can.

We hope our VEs are willing to take on this endeavor with us as we continue to move toward electronic testing, as it is vital to the amateur radio community. We will be here every step of the way to help with and ensure a smooth transition. We remain committed to offering quality programs and services; this includes providing a superior overall experience for our customers and potential customers, as well as demonstrating our capabilities and value in serving the public.

We look forward to continuing to serve you wherever your examining takes you, and we thank you for your service to our VEC and the amateur radio community.

Contest Corral

July 2025

Check for updates and a downloadable PDF version online at **www.arrl.org/contest-calendar**.
Refer to the contest websites for full rules, scoring information, operating periods or time limits, and log submission information.

Start - Finish				Bands	Contest Name	Mode	Exchange	Sponsor's Website
Date	Time	Date	Time					
1	0000	1	2359	1.8-28,50,144	RAC Canada Day Contest	CW Ph	RS(T), VE prov/terr or serial	www.rac.ca
1	0100	1	0159	1.8-28,50	Worldwide Sideband Activity Contest	Ph	RS, age group (OM-YL-youth YL-youth)	wwsac.com/rules.html
1	0300	1	0400	1.8-28	QCX Challenge	CW	RST, name, SPC, rig type	www.qrp-labs.com
1	0300	1	0400	1.8-28	ICWC Medium Speed Test	CW	Name, serial	internationalcwcouncil.org/mst-contest
2	1700	2	2100	144	VHF-UHF FT8 Activity Contest	Dig	4-char grid	www.ft8activity.eu
3	0000	4	0300	7	Walk for the Bacon QRP Contest	CW	RST, SPC, name, mbr or pwr; 13 WPM max	qrpcontest.com/pigwalk40
3	1800	3	2200	28	NRAU 10m Activity Contest	CW Ph Dig	RS(T), 6-char grid	nrau.net
3	1900	3	2100	1.8-28,50	SKCC Sprint Europe	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
4	0100	4	0130	1.8-28,50	NCCC FT4 Sprint	Dig	4-char grid	www.ncccsprint.com/ft4ns.html
5	0000	5	2359	1.8-28	Venezuelan Independence Day Contest	CW Ph Dig	RS(T), serial	radioclubvenezolano.org
5	0000	5	2359	1.8-28,50	FOC Old School Classic 1960s QSO Party	CW	Actual RST, 3-letter class, year first licensed, name	www.g4foc.org
5	0800	6	1100	3.5	NZART Memorial Contest	CW Ph	RS(T), serial	www.nzart.org.nz
5	1200	6	1200	50,144	CQ Worldwide VHF SSB/CW Contest	CW Ph	4-char grid	www.cqww-vhf.com
5	1200	6	1200	50,144,432	TA VHF/UHF Contest	CW Ph	RS(T), serial, 6-char grid	trac.org.tr
5	1400	6	1400	1.8-28	Marconi Memorial HF Contest	CW	RS(T), serial	www.arifano.it
5	1500	6	1500	3.5-14	Original QRP Contest	CW Ph	RST + serial + "/" + pwr category	www.qrpcc.de
5	2000	6	2000	7	PODXS 070 Club 40m Firecracker Sprint	Dig	RST, SPC	www.podxs070.com
7	1630	7	1729	3.5,7	OK1WC Memorial (MWC)	CW	RST, serial	memorial-ok1wc.cz
7	1900	7	2030	3.5	RSGB 80m Club Championship, CW	CW	RS(T), serial	www.rsgbcc.org
8	0000	8	0200	3.5-28	ARS Spartan Sprint	CW	RST, SPC, pwr	ars-qrp.com
8	0100	8	0159	1.8-28,50	Worldwide Sideband Activity Contest	Ph	RS, age group (OM-YL-youth YL-youth)	wwsac.com/rules.html
8	1800	8	1929	3.5,7	DARC RTTY Sprint	Dig	RST, (DOK/"NM") or serial	www.darc.de
9	1145	9	1300	1.8-28	A1Club AWT	CW	RST, name	a1club.org/contest/awt
9	1700	9	2100	432	VHF-UHF FT8 Activity Contest	Dig	4-char grid	www.ft8activity.eu
12	1200	13	1200	1.8-28	IARU HF World Championship	CW Ph	RS(T), IARU HQ soc or ITU zone	www.arrl.org/iaru-hf-world-championship
12	1200	13	2359	1.8-28,50	SKCC Weekend Sprintathon	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
13	2000	13	2300	1.8-28	QRP ARCI Summer Homebrew Sprint	CW	RST, SPC, mbr or pwr	qrparci.org
14	0000	14	0200	1.8-28	4 States QRP Group Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or pwr	www.4sqrp.com
15	0100	15	0159	1.8-28,50	Worldwide Sideband Activity Contest	Ph	RS, age group (OM-YL-youth YL-youth)	wwsac.com/rules.html
16	1700	16	2100	1.2G	VHF-UHF FT8 Activity Contest	Dig	4-char grid	www.ft8activity.eu
16	1900	16	2030	3.5	RSGB 80m Club Championship, SSB	Ph	RS + serial	www.rsgbcc.org
17	0000	18	0300	14	Walk for the Bacon QRP Contest	CW	RST, SPC, name, mbr or pwr; 13 WPM max	qrpcontest.com/pigwalk20
17	0030	17	0230	3.5-14	NAQCC CW Sprint	CW	RST, SPC, (NAQCC No./pwr)	naqcc.info/sprint_rules.html
17	1900	17	2000	3.5-14	NTC QSO Party	CW	RST, SPC, mbr or pwr	pi4ntc.nl/ntcqp
18	0145	18	0215	3.5-28	Weekly RTTY Test	Dig	Name, SPC	radiosport.world/wrt.html
19	0000	20	2359	1.8-28	LABRE DX Contest	CW Ph	RS(T), 2-ltr state or 2-ltr continent	www.labre.org.br
19	0700	19	1459	7,14,21,28	Russian Radio Team Championship	CW Ph	RS(T), mbr code or ITU zone	srr.ru
19	0800	19	1400	1.8-7	Trans-Tasman Low-Bands Challenge	CW Ph Dig	RS(T), serial	www.wia.org.au
19	1000	19	2159	3.5-28	YOTA Contest	CW Ph	RS(T), age	yotacontest.mrasz.org
19	1200	19	1359	1.8-28,50	Feld Hell Sprint	Dig	RST, mbr, SPC, 4-char grid	sites.google.com/site/feldhellclub
19	1200	20	1200	50,144	CQ Worldwide VHF Digital Contest	Dig	4-char grid	www.cqww-vhf.com
19	1400	20	1400	70	IARU Region 1 70 MHz Contest	CW Ph	RS(T), serial, 6-char grid	www.iaru-r1.org
19	1800	20	0559	3.5-28	North American QSO Party, RTTY	Dig	Name, SPC	www.ncjweb.com
20	0900	20	1600	3.5-14	RSGB International Low Power Contest	CW	RST, serial, pwr	www.rsgbcc.org
20	2300	21	0100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or pwr	qrpcontest.com/pigrun
22	0100	22	0159	1.8-28,50	Worldwide Sideband Activity Contest	Ph	RS, age group (OM-YL-youth YL-youth)	wwsac.com/rules.html
23	0000	23	0200	1.8-28,50	SKCC Sprint	CW	RST, SPC, name, mbr or "none"	www.skccgroup.com
24	1900	24	2030	3.5	RSGB 80m Club Championship, Data	Dig	RS(T), serial	www.rsgbcc.org
26	0000	27	2359	1.8-28,50,144	MARAC US Counties QSO Party	CW Ph Dig	RS(T), state and county or "DX"	www.marac.org
26	0000	27	2359	28	FRAPR 10M Contest	CW Ph	RS(T), pwr	www.frapr.org
26	1200	27	1200	3.5-28	RSGB IOTA Contest	CW Ph	RS(T), serial, IOTA no.	www.rsgbcc.org
26	1200	27	1200	50	ARAM 50 MHz Contest	CW Ph	RS(T), serial, 6-char grid	www.aram.pt
26	1500	27	0300	3.5-28	Alabama QSO Party	CW Ph	RS(T), AL county or SPC	alabamacontestgroup.org
27	1700	27	2100	7,14,21,28	ARS Flight of the Bumblebees	CW	RST, SPC, pwr, or Bumblebee number	ars-qrp.com
28	1900	28	2100	3.5-28	RSGB FT4 Contest	Dig	Signal report	www.rsgbcc.org
29	0100	29	0159	1.8-28,50	Worldwide Sideband Activity Contest	Ph	RS, age group (OM-YL-youth YL-youth)	wwsac.com/rules.html

There are a number of weekly contests not included in the table above. For more info, visit: **www.qrpfoxhunt.org**, **www.ncccsprint.com**, and **www.cwops.org**. All dates and times refer to UTC and may be different from calendar dates in North America. Contests are not conducted on the 60-, 30-, 17-, or 12-meter bands. Mbr = Membership number. Serial = Sequential number of the contact. SPC = State, Province, DXCC Entity. XE = Mexican state. Listings in blue indicate contests sponsored by ARRL or *NCJ*. The latest time to make a valid contest QSO is the minute listed in the "Finish Time" column. *Data for Contest Corral is maintained on the WA7BNM Contest Calendar at* **www.contestcalendar.com** *and is extracted for publication in* QST *2 months prior to the month of the contest. ARRL gratefully acknowledges the support of Bruce Horn, WA7BNM, in providing this service.*

Andrew Goss, AA5JF, amgoss05@yahoo.com

2024 ARRL 10-Meter Contest Results

The results of the December 14 – 15, 2024, event.

Solar Cycle 25 rose to the occasion, solidifying the ARRL 10-Meter Contest as one of the highlights of the contest season. With the record-setting 6,661 submitted logs, this was the biggest ARRL contest of the year, with more than 2.03 million contacts reported. There were more than 10% more logs submitted from the United States compared to last year, and incredible scores were achieved from every corner of the country.

Band conditions were excellent, and space weather did not intrude much, with the solar flux index in the upper 160 range for the entire weekend. E-skip was consistently long, with conditions favoring east-west propagation in the Northern Hemisphere.

There was fierce competition in almost all of the categories, with many operators spending much of their daylight hours in front of the radio. There were 176 entries, with final scores reaching more than one million points compared to 85 in 2023 and 74 in 2022. Almost 2,000 participants took advantage of the recently introduced Limited Antenna Overlay, and there was a healthy youth competition. Fifty-five participants noted in their entries that they were age 25 or younger.

Preston Moore, N5YIZ, combined operating in the 2024 ARRL 10-Meter Contest with a Parks on the Air activation at Galveston Island State Park in Texas. He made 813 contacts in the event, taking home second place in the West Gulf Division in the Single Operator, Phone Only, Low Power category. [Preston Moore, N5YIZ, photo]

Affiliated Club Competition

Club	Score	Entries
Unlimited		
Potomac Valley Radio Club	48,172,882	143
Yankee Clipper Contest Club	44,417,514	102
Northern California Contest Club	33,146,384	91
Frankford Radio Club	28,631,330	75
Florida Contest Group	24,701,108	66
Minnesota Wireless Assn.	19,324,832	84
Society of Midwest Contesters	18,673,832	88
Medium		
Arizona Outlaws Contest Club	15,333,478	38
Southern California Contest Club	13,857,536	38
Contest Club Ontario	13,019,048	48
Mad River Radio Club	9,341,274	17
Western Washington DX Club	7,457,914	22
Maritime Contest Club	6,827,204	14
Tennessee Contest Group	6,453,382	29
Willamette Valley DX Club	5,540,694	24
Grand Mesa Contesters of Colorado	5,301,116	30
Hudson Valley Contesters and DXers	5,232,000	25
Central Texas DX and Contest Club	4,725,120	14
South East Contest Club	4,722,308	22
Kansas City Contest Club	4,305,490	17
Big Sky Contesters	4,272,122	7
Kentucky Contest Group	4,069,174	16
Niagara Frontier Radiosport	3,638,738	16
Alabama Contest Group	3,599,492	19
Order of Boiled Owls of New York	3,199,592	9
Orca DX and Contest Club	3,121,944	13
DFW Contest Group	2,847,642	21
Saskatchewan Contest Club	2,508,754	7
The Villages ARC	2,358,972	11
Hampden County Radio Assn.	2,083,354	10
Swamp Fox Contest Group	1,901,414	23
Arkansas DX Assn.	1,703,958	7
Oklahoma DX Assn.	1,542,602	4
Spokane DX Assn.	1,539,004	11
Great Places Contest Club	1,513,874	6
Rochester (NY) DX Assn.	1,473,004	11
Heartland DX Assn.	1,466,780	6
Northeast Maryland Amateur Radio Contest Soc.	1,463,450	11
Deep Dixie Contest Club	1,459,422	7
Radiosport Manitoba	1,258,542	5
Carolina DX Assn.	1,028,642	11
Bay Area DXers	964,576	5
Mother Lode DX/Contest Club	718,064	6
599 DX Assn.	508,402	4
Contoocook Valley Radio Club	457,498	3
All Idaho Contest Club	426,060	5
Texas DX Soc.	415,080	9
Portage County Amateur Radio Service	334,518	6
Cape Fear ARS	319,118	14
South Jersey Radio Assn.	233,340	3
Valley Amateur Radio Assn.	233,062	6
Pacific Northwest VHF Soc.	218,244	5
Lake Area Radio Klub (SD)	174,910	4
Driftless Zone Contesters	174,248	3
Dupage ARC	120,214	3
Edmonds Woodway ARC	118,368	4
North Coast Contesters	108,396	5
New Providence ARC	93,642	5
Fourlanders Contest Team	67,388	3
Silver Comet ARS	65,266	4
Louisiana Contest Club	58,676	3
Sierra Foothills ARC	52,384	3
American Red Cross Emergency Communications Service	48,470	3
Granite State ARA	42,148	4
Sierra Nevada ARS	28,252	4
Local		
Iowa DX and Contest Club	1,706,324	4
Central Virginia Contest Club	1,455,588	5
Radio Amateurs of Northern Vermont	1,079,428	3
Bristol (TN) ARC	949,432	7
CTRI Contest Group	724,546	5
Boulder ARC	338,740	5
Meriden ARC	195,294	4
Providence Radio Assn.	117,758	3
Vienna Wireless Soc.	91,928	3
Lake Area Amateur Radio Klub	84,766	3
Hughes ARC	83,218	4
Metro DX Club	65,228	3
Athens County ARA	54,110	3
Big South Fork ARC	52,376	9
OH-KY-IN ARS	44,598	3
High Desert Amateur Radio Group	42,326	4
North Fulton ARL	20,184	3
Baldwin County ARC	9,446	3

The next ARRL 10-Meter Contest will be held December 13 – 14, 2025.

Top Ten — United States

Single Operator, Mixed Mode, High Power

KQ2M	2,908,260
KM7W (KL9A, op)	2,754,960
K7RL	2,122,830
K6XX	2,088,000
AA4NC (N4YDU, op)	1,935,480
WH7T (WH7W, op)	1,700,680
KU2M	1,656,348
KØTT	1,588,500
N3QE	1,304,600
NR7T	1,181,700

Single Operator, Mixed Mode, Low Power

N8II	1,423,520
K2PS	1,120,896
NU6S	921,888
WA7NB	725,832
N5JJ	706,486
ACØW	659,714
K8MR	650,960
K4EJ	502,360
WØPI	497,420
KØEA	401,014

Single Operator, Mixed Mode, QRP

K7FR	193,760
NDØC	183,854
N6AN	118,084
WB2AMU	85,012
KEØZ	71,928
K2GMY	65,254
W5ESE	30,856
WR5O	20,790
NØLMQ	14,664
AF9J	14,520

Single Operator, Phone Only, High Power

K5TR	943,398
WW2DX	770,032
KW8N	675,100
WA3A	624,340
K1FMS	586,024
W1SJ	585,616
N4OX	578,550
N1PGA	570,486
AF1T	453,024
KH6ZB (WØZB, op)	443,080

Single Operator, Phone Only, Low Power

W6AFA	295,074
KF5VDX	243,978
N7MGW	179,634
W7TNY	153,296
N5YIZ	147,936
WØSJE	142,740
N6OKU	141,778
KS2G	133,772
WD4IXD	123,728
KK7AC	114,144

Single Operator, Phone Only, QRP

KEØWPA	37,356
W6QU (W8QZA, op)	35,964
WA3LXD	31,262
WB2VVV	26,134
WN1C	21,376
W1JCW	14,994
WWØWB	8,648
KDØFDJ	8,610
AC2N	6,800
N5IRA	4,484

Single Operator, CW Only, High Power

N2IC	1,781,608
K1TO	1,491,720
NN7CW	1,421,040
K1DG	1,420,800
K7RAT (N6TR, op)	1,259,256
N2MF	1,103,388
W7WA	1,089,720
K1LT	1,075,284
W2RQ	1,069,740
NA8V	1,027,512

Single Operator, CW Only, Low Power

K7SV	954,196
N5RZ	902,720
WJ9B	754,992
K1TR	724,360
WØYK	714,096
N7VM	679,120
KØAV	671,616
WE9V	624,000
N7YK	519,120
KN7T	514,080

Single Operator, CW Only, QRP

N4OGW	483,492
W6JTI	260,760
N5OE	192,528
WB2CPU	108,360
NQ2W	95,152
KV8Q	94,284
W7YAQ	89,712
N8AP	83,304
N7JI	75,240
N4NM	57,424

Single Operator Unlimited, Mixed Mode, High Power

N8OO	2,935,996
K9NW	2,443,600
N6WM	2,109,744
W6YX (N7MH, op)	2,078,250
K6LL	2,031,960
WC6H	2,017,980
N6TV	2,007,904
WM9C	1,989,712
N4RV	1,908,984
W8MJ	1,877,010

Single Operator Unlimited, Mixed Mode, Low Power

KB3WD	2,021,088
N4UU	1,207,312
W9XT	884,080
NØHJZ	746,000
KQ7I	667,590
KB1EFS	667,400
KØKX	549,936
W1WBB	526,756
KK1L	520,828
NS3T	512,730

Single Operator Unlimited, Mixed Mode, QRP

K7SS	521,642
WN6W	129,600
WE9R	75,328
K2AL	57,440
AA4GA	27,904
N4AKV	19,722
K8ZT	720

Single Operator Unlimited, Phone Only, High Power

KW7MM	1,113,560
K3EST	925,880
WA2BOT	621,232
WV4P	595,056
WT1A	581,494
K2SSS	540,394
K3DNE	420,444
NR6Q	408,240
KA1ZD	370,520
N2ZN	367,812

Single Operator Unlimited, Phone Only, Low Power

K2DRH	363,630
N7MZW	214,240
N9TGR	165,044
NA4DA	153,512
WZ8T	111,220
KD9YOO	87,048
AJ4HP	85,144
NDØTS	67,336
KD9GY	64,478
NA9VY	63,242

Single Operator Unlimited, Phone Only, QRP

KG1E	42,968
K3TW	23,790
W3EK	19,764
WB6RAB	12,862
W6R (WQ6X, op)	6,240
W7AYT (WQ6X, op)	240

Single Operator Unlimited, CW Only, High Power

W1KM	1,716,364
N9NC	1,463,588
N3RD	1,446,972
AA3B	1,416,524
K9CT	1,399,392
K3WW	1,231,056
K3RA	1,225,700
N6SS	1,217,764
NSØR	1,130,568
K8IA	1,127,280

Single Operator Unlimited, CW Only, Low Power

N4AO (WC4E, op)	864,552
N4WW (N4KM, op)	813,440
AH6KO	782,304
N2YO	742,532
K1RO	710,752
K6WSC	549,884
K3PA	501,424
WA1FCN	476,476
NS4T	434,236
KS1J	411,648

Single Operator Unlimited, CW Only, QRP

KG9X	386,240
K6JS	214,240
W1FJ	155,040
K2YAZ	121,448
KKØU	104,748
WQ6X	88,504
AC2YD	77,688
WD4CFN	50,652
WC7S	37,944
KR4AE	34,080

Multioperator, Single Transmitter, High Power

K1LZ	4,773,236
N2NT	2,740,036
NX5M	2,649,150
K9RS	2,491,780
KW1X	2,382,030
N4SS	2,368,120
KH6AQ	1,938,504
NX6T	1,926,264
WW4LL	1,843,776
K3AJ	1,735,064

Multioperator, Single Transmitter, Low Power

KA4RRU	1,505,602
KT4XA	857,090
K4EA	700,064
W9KM	637,292
W1FM	456,604
ND8DX	453,824
W4TG	450,722
K6EI	444,636
W3ZGD	439,310
WA1F	312,584

Top Ten — Canada

Single Operator, Mixed Mode, High Power

VY2TT	2,514,944
VE3AT	2,215,288
VA7XU	222,024
VE3TAZ	39,846
VE3SST	26,718
VE5CPU	13,824
VA3CK	7,068

Single Operator, Mixed Mode, Low Power

VE5SF	611,520
VA3OKG	324,480
VE3TM	311,748
VY2LI	158,640
VE3OIL	148,332
VE7AX	125,356
VE3FH	125,280
VE3UZ	104,648
VA3KRJ	82,948
VA7EU	46,252

Single Operator, Mixed Mode, QRP

VA2IW	259,014
VE3DQN	3,068

Single Operator, Phone Only, High Power

VE6FI	217,890
VE4VT	174,090
VE3YZ	126,690
VA3OK	96,320
VE3LRL	54,096
VE3YV	28,224
VE1JS	24,960
VA2OBW	11,328
VE4OK	3,024

Single Operator, Phone Only, Low Power

VE2HIT	71,628
VE2IAA	56,316
VA7IR	42,568
VE3KMQ	26,268
VE7GX	24,192
VE3BZ	22,400
VA6AGR	20,650
VA7LEC	18,792
VE6CLG	13,362
VA2BS	12,864

Single Operator, Phone Only, QRP

VA3RTG	9,292
VA3MZD	144

Single Operator, CW Only, High Power

VE6WP	654,240
VE3DZ	497,640
VA3AR	354,660

Single Operator, CW Only, Low Power

VY2OX	363,888
VA7ST	260,640
VE9KK	252,288
VE5GC	243,012
VA3SP	230,000
VE3MA	178,880
VE3SMA	176,688
VA6WWW	165,464
VE5UF	162,680
VE7JKZ	153,892

Single Operator Unlimited, Mixed Mode, High Power

VE3RZ	1,460,232
VE7NZ	1,124,448
VE9XX	645,876
VO2AC	604,100
VE4GV	562,700
VE3YT	415,338
VO1CH	164,560
VE3KTB	114,240
VA3CW	68,328
VE3KG	68,250

Single Operator Unlimited, Mixed Mode, Low Power

VE9ML	274,988
VA4HZ	162,432
VE7CV	158,220
VE3PJ	96,136
VE3AGC	45,496
VE9WH	42,504
VA3HYM	21,350
VA4ADM	20,944
VE3HZ	19,942
VE3NI	936

Single Operator Unlimited, Mixed Mode, QRP

VA6RCN	71,610
VE3GMZ	26,334

Single Operator Unlimited, Phone Only, High Power

VE9CF	610,148
VA7TU	36,396
VA3DJF	4,758

Single Operator Unlimited, Phone Only, Low Power

VO1GO	190,938
VE9CZ	148,934
VE3RGO	72,380
VE1RPX	59,940
VE2CSM	58,520
VY2GF	47,242
VE3GJP	15,488
VE3UZX	15,360
VE3BFU	14,396
VE3PCK	12,920

Single Operator Unlimited, CW Only, High Power

VA2WA	1,652,496
VE5MX	1,397,120
VE3JM	1,120,020
VE3NNT	929,672
VE3NZ	830,256
VE3EJ	611,520
VE3CT	592,116
VE2FK	576,688
VA1MM	538,560
VE5ZX	458,172

Single Operator Unlimited, CW Only, Low Power

VE9AA	700,740
VE1ANF	609,216
VA3FF	280,340
VE1ANU	219,136
VE3AQ	180,868
VE4DL	175,628
VE3MGY	152,776
VE3VN	146,400
VA3TMV	124,432
VE2OWL	88,192

Single Operator Unlimited, CW Only, QRP

VA3HY	100

Multioperator, Single Transmitter, High Power

VE7SAR	686,052
VE4YH	337,336
VE3MIS	255,316
VY2OM	241,572
VE6AO	3,944

Multioperator, Single Transmitter, Low Power

VA7DZ	191,360

Top Ten — Mexico

Single Operator, Mixed Mode, Low Power

XE1AQY	9,894

Single Operator, Phone Only, High Power

XE3R	283,536
XE2Q	77,274
XE1CKJ	75,036

Single Operator, Phone Only, Low Power

XE1JKW	265,608
XE2SMG	173,760
XE1ADY	109,760
XE1CIC	103,360
XE1YL	89,744
XE1BLA	88,796
XE2OK	67,336
XE2YWB	13,440
XE2LVM	8,820
XE2N	8,400

Single Operator, CW Only, High Power

XE2X	940,196
XE1CT	376,768

Single Operator, CW Only, Low Power

XE2S	487,956
XE2I	228,232
XE1AY	172,608
XE2E	163,620
XE2T	2,520
XE1RE	1,664
XE1O	484

Single Operator, CW Only, QRP

XE2MWY	16,380
6D5C (XE1H, op)	5,576

Single Operator Unlimited, Mixed Mode, High Power

XE2W	483,990
XE2CQ	168,560

Single Operator Unlimited, Phone Only, Low Power

XE2JS	319,918
XE1ZTW	127,050

Single Operator Unlimited, CW Only, High Power

4A5E	98,908

Single Operator Unlimited, CW Only, Low Power

XE2F	2,944

Multioperator, Single Transmitter, Low Power

XE2CRH	249,340

Full Results Online

You can read the full results of the contest online at **https://contests.arrl.org**. You'll find detailed analysis and more play-by-play, along with the full line scores. Improve your results by studying your log-checking report, too.

Top Ten – DX

Single Operator, Mixed Mode, High Power

ZF5T	3,708,448
EB5A	1,972,058
GM5X (GM4YXI, op)	1,706,668
DH8BQA	1,289,610
PCØA	1,213,894
LX1NO	1,087,170
TI8/N7ZG	930,944
UPØL (UN9LW, op)	915,204
DUØA	900,900
PY2EX	899,160

Single Operator, Mixed Mode, Low Power

LZ4TX	874,800
J8AA (J88BTI, op)	703,692
VR2T	616,120
UA4FER	507,494
EA9ACD	407,264
JK1OLT	399,300
UP7L (UN6LN, op)	387,288
9A9R	385,200
YO2LEA	352,800
LU4HK	291,312

Single Operator, Mixed Mode, QRP

PY2PLL	253,872
BA7OLK	145,926
PY2NY	142,058
LZ6E (LZ1GU, op)	90,850
JH7UJU	72,842
HA6IAM	63,344
OK6OK	62,160
UY7LM	61,152
RW3AI	30,996
JR2EKD	24,380

Single Operator, Phone Only, High Power

HK1T	1,308,960
EF8R (EA5Z, op)	1,226,264
ZW5B (LU9ESD, op)	1,179,216
CR6K (CT1CJJ, op)	735,552
HP1XV	501,114
VR2P (VR2XAN, op)	498,972
M6T (GØAEV, op)	474,118
CE6CGX	417,268
F4EGZ	378,092
VK4A	320,294

Single Operator, Phone Only, Low Power

PP1WW	404,260
PY2UD	392,764
HI3T	211,816
PU2UAF	198,400
LU4JEA	186,624
VR2VRC	184,110
KP3V	170,324
9Z4CT	143,038
CX1DF	138,592
CT7BOD	136,416

Single Operator, Phone Only, QRP

CO8RH	109,536
TI1E (TI2YO, op)	108,240
RQ7L	73,408
PY2BN	61,852
MW7FON	27,504
MI5JYK	11,544
LQ1D (LU3DR, op)	10,962
L2ØE	7,084
YC8BUV	7,068
PY5YA	5,328

Single Operator, CW Only, High Power

LN8W (LB1GB, op)	856,064
OH7K (OH7MA, op)	774,792
S51MM	762,648
JJØVNR	742,500
DK9PY	703,072
YT3D	670,880
MMØT (GM3WUX, op)	640,784
KP2M (KT3Y, op)	629,424
EA5EL	599,040
GW4J (GWØETF, op)	585,728

Single Operator, CW Only, Low Power

NP3A	1,154,896
HI3R	558,420
TI5/VA3RA (VE3IKV, op)	376,488
CO2JD	357,008
CT3KN	344,080
JS1OYN	301,788
4K6FO	301,760
TI2OY	290,612
JH7QXJ	259,572
9A8A	259,008

Single Operator, CW Only, QRP

EA8RM	180,908
LZ2RS	129,084
JQ1NGT	102,528
US5VX	92,496
M7R (GØTPH, op)	83,804
EA8AQM	72,420
EA4EPY	71,732
US1VM	71,120
R6CC	58,560
4F3OM	57,824

Single Operator Unlimited, Mixed Mode, High Power

LT3E (LU5WW, op)	2,477,004
7Q2T	2,259,796
HA3NU	1,969,654
PV2K (PY2KNK, op)	1,901,592
OG1F (OH1TM, op)	1,835,064
RW1A	1,672,476
MM2N	1,556,752
UA6AA	1,551,804
ES7A (ES7NY, op)	1,467,648
HB9FAP	1,367,730

Single Operator Unlimited, Mixed Mode, Low Power

WP3C (N2TTA, op)	1,877,808
9Z4Y	1,284,000
ED1R (EA4AOC, op)	1,238,688
9J2FI (DL2RMC, op)	1,143,616
PY5AMF	866,636
ED5F (LU1FAM, op)	833,508
SO9M (SQ9UM, op)	714,834
SP9XCN	639,042
BGØDXC (BA4TB, op)	626,640
OK6Y (OK2PTZ, op)	472,160

Single Operator Unlimited, Mixed Mode, QRP

EA3O	302,202
JA6GCE	200,640
ES2MC	165,998
S53K	125,424
RA7C	103,356
YV6BXN	70,616
LU3BMS	65,120
UR5FEO	59,348
YO8FC	42,900
HI3K	33,072

Single Operator Unlimited, Phone Only, High Power

TI1T	972,468
TI1K (TI5CDA, op)	951,390
ZZ5K (PP5RT, op)	924,768
LP1H	903,040
9A1P	814,320
TM1C (F4ARU, op)	770,658
TMØT (F4HQZ, op)	725,760
SN2M (SP2XF, op)	719,488
F4GGQ	580,932
ED2X (EA2LMI, op)	517,428

Single Operator Unlimited, Phone Only, Low Power

6Y1A (NØGJW, op @6Y5PW)	613,872
CX6TU	341,584
4M5A (YV5RAB, op)	320,606
PZ5TW (PY8WW, op)	306,436
LU2PWY	250,204
TI1F (TI2RF, op)	249,340
UZ7C (UT9CZ, op)	248,216
HGØR (HAØNAR, op)	208,680
PQ5D (PP5DZ, op)	203,352
PP5FB	203,280

Single Operator Unlimited, Phone Only, QRP

IWØSAG	21,840
JM1NKT	11,430
GW8C (MØWLY, op)	8,856
7Z1AV	3,000
LA1TPA	1,656
CT7AQF	1,200
UT7AA	546
JH3DMQ	408
PU2NZO	190
PU5IKE	180

Single Operator Unlimited, CW Only, High Power

D4Z (IK2JUB, op)	2,330,640
CR3DX (OM3RM, op)	2,173,248
TM6M (F4DXW, op)	1,340,508
P3X	1,233,408
LS5H (LW5HR, op)	1,189,708
HA5JI	1,145,620
II2Q (IK2PFL, op)	1,115,200
OM8CW	1,101,576
OM2VL	1,056,424
LY5W	961,472

Single Operator Unlimited, CW Only, Low Power

VP9I (K2WK, op)	980,424
9A5D (9A3ID, op)	977,840
TM8O (F1AKK, op)	857,340
CO8ZZ	719,576
MI5I (GIØRQK, op)	554,880
EF6B	493,500
7S9A (SA6FOL, op)	483,840
SP2EWQ	467,596
SP1D	447,408
9A6A	432,600

Single Operator Unlimited, CW Only, QRP

G4ZFE	284,544
S55OO	223,552
JA6VZB	154,812
BH4TQX	133,920
UA7G	93,328
JK7DWD	91,200
UY5LW	80,388
HA3HX	72,688
SFØA (SMØLPO, op)	69,276
YUØW	58,800

Multioperator, Single Transmitter, High Power

NP2X	4,671,018
KP4AA	3,886,000
FY5KE	3,620,040
PW2E	3,411,392
CR3Z	3,093,798
PJ2T	3,053,778
9A5Y	2,928,384
VP5V	2,586,374
ZPØX	2,542,310
IO4X	2,459,694

Multioperator, Single Transmitter, Low Power

VP2VMM	3,809,280
PX2A	1,459,604
HK3RD	1,257,580
PT1M	910,800
S53F	846,672
KP4NZ	654,126
R8WX	491,062
SO4M	474,430
PY4BQS	468,032
HC2GRC	466,744

Youth Overlay

United States

Call	Score	Section	QSOs	Mults
Single Operator, CW Only, High Power				
K8O (K4IEY, op)	1,600	WPA	25	16
Single Operator, Phone Only, High Power				
N4ML (@ KØEJ)	181,288	TN	737	124
Single Operator, Phone Only, Low Power				
KG7HTE	3,672	OR	52	36
KG5LLM	3,050	STX	62	25
KK7UXY	1,140	OR	31	19
KK7OYV	1,120	UT	28	20
KQ4JEQ	1,092	KY	44	13
KG5KRV	546	STX	21	13
W4BB	510	SC	20	15
KQ4ZEJ	390	AL	15	13
KFØGOV	338	CO	14	13
KFØRRJ	330	MO	15	11
KFØRHQ	162	CO	10	9
K4MCD	140	VA	10	7
KQ4PSZ	8	SC	3	2
Single Operator, Phone Only, QRP				
KEØWPA	37,356	MN	286	66
Single Operator Unlimited, Mixed Mode, Low Power				
KE8ZYD	5,200	MI	47	40
KM4TQD	286	GA	12	11
KFØQFD	204	KS	16	6
WDØREW	18	MO	3	3
Single Operator Unlimited, Mixed Mode, QRP				
N4AKV	19,722	SC	102	57
Single Operator Unlimited, Phone Only, High Power				
W7MTH	52,360	WWA	378	70
Single Operator Unlimited, Phone Only, Low Power				
KC1SDD	14,282	EMA	197	37
K4VBL	6,076	VA	63	49
NØAPX	3,472	MO	62	28
KO6GMZ	3,162	SCV	51	31
K8LG	1,200	MI	32	20
Mexico				
Single Operator, Phone Only, Low Power				
XE1GLA	418	XE	19	11
Single Operator, CW Only, Low Power				
XE1O	484	XE	12	11
DX				
Single Operator, CW Only, Low Power				
PY2POA	1,292	PY	19	17
Single Operator, CW Only, QRP				
BH6BEZ	48	BY	4	4
Single Operator, Mixed Mode, High Power				
F4IAZ	72,600	F	329	110
Single Operator, Mixed Mode, Low Power				
SV8SYK	32,832	SV	170	72
Single Operator, Mixed Mode, QRP				
BA7OLK	145,926	BY	431	99
Single Operator, Phone Only, High Power				
YU7RCI	62,400	YU	332	96
Single Operator, Phone Only, Low Power				
BGØEJN	7,128	BY	102	36
E74FRS	4,788	E7	64	38
YD8BUL	4,320	YB	124	18
TC7YOTA	3,500	TA	72	25
HI5YJM	3,038	HI	51	31
YS1YOTA	1,488	YS	33	24
YU4ALT	864	YU	24	18
Single Operator Unlimited, CW Only, High Power				
MØSDV	76,432	G	283	68
Single Operator Unlimited, CW Only, Low Power				
JF6EVR	8,120	JA	73	29
OM2ADM	64	OM	4	4
Single Operator Unlimited, Mixed Mode, Low Power				
JI1PUC	431,640	JA	766	165
DJ4MX	40,192	DL	161	64
JA1ZGP	2,752	JA	45	16
R8CI	2,200	UA9	34	22
Single Operator Unlimited, Phone Only, High Power				
DLØMT	48,880	DL	263	94
ET3AA	27,280	ET	257	55
Single Operator Unlimited, Phone Only, Low Power				
ZL2GUN	2,352	ZL	42	28
BG9JDI	1,862	BY	50	19
OL24YOTA	1,260	OK	31	21

James Duffey, KK6MC, JamesDuffey@comcast.net

2025 ARRL January VHF Contest Results

This year's ARRL January VHF Contest was held January 18 – 20, 2025.

Top Ten

Classic Rover

KF2MR/R	81,054
KE2BUY/R	75,790
K2UA/R	71,116
K2EZ/R	61,110
W2EV/R	38,480
AG4V/R	24,009
VE3OIL/R	17,300
KØBAK/R	7,784
W3ICC/R	5,742
K2AXX/R	3,059

Limited Rover

KA5D/R	31,500
W5TN/R	24,723
KM4OZH/R	7,684
NV4B/R	6,200
N6GP/R	4,234
KE4WMF/R	3,813
VA3ELE/R	2,356
KE5NJ/R	2,106
KA7RRA/R	1,728
K1UU/R	1,725

Unlimited Rover

KG6CIH/R	45,676
KCØP/R	8,697
NØHZO/R	5,285
WC7M/R	340

Single Operator, High Power

N2JMH	247,380
K1TEO	111,573
K1RZ	99,314
K2TER	84,084
WB2RVX	77,714
N8LRG	65,120
W3IP	56,642
K1KG	51,168
WA3DRC	42,048
K2DH	37,666

Single Operator, Low Power

N2WK	98,685
WN3A	95,484
NR2C	81,024
WA3NUF	63,551
N3RG	58,984
N2OA	46,716
KA2ENE	45,225
NF3R	37,788
N2SCJ	28,221
WA3GFZ	22,260

Single Operator, Analog Only, High Power

W2FU	79,833
WZ1V	46,944
W2KV	13,260
KC3BVL	10,642
WA1PBU	9,840
KA3FQS	9,150
WØGHZ	7,744
VE3ZV	7,344
VE3KG	5,148
N6RO	4,875

Single Operator, Analog Only, Low Power

AF1T	94,184
VE3DS	25,550
WB2JAY	12,144
K6MI	7,840
WB2VVV	7,298
NU6S	5,525
VE3KH	3,808
AC1J	2,688
WB2SIH	2,150
KD2HZI	1,800

Single Operator, Portable

K5ND	4,944
AF5T	1,404
AB4DX	924
VA2VT	869
WX4WKY	378
WQ6D	374
NØSUW	210
NØJK	30
W1UO	18
KI6HQT	4
XE2YWB	4

Single Operator, Portable, Analog Only

N3YMS	6,624
N2MAK	2,300
W7JET	2,071
KM6RNJ	637
WN1C	333
WB2AMU	315
N2YTF	120
KF6CVA	84
KK4YZG	48
KQ2RP	48

Single Operator, Three-Band

KE8AKW	34,034
W5TRL	18,094
K1DC	12,122
W3FAY	9,384
AJ6T	6,912
N3ALN	6,068
NE2U	5,560
NS4T	5,555
N4HB	5,120
KD2CDV	4,370

Single Operator, Analog Only, Three-Band

N7QOZ	2,088
WB7FJG	812
W1SRH	768
KO9A	525
W1TR	468
N1JD	405
K2ZH	288
KEØQXV	210
KV4ZY	198
VE3IQZ	160

Single Operator, FM Only

AF6GM	504
N1TEN	416
WB4TT	390
KO6BT	252
N6DRE	234
W1NIV	129
N7WLC	48
NL7CO	44
W5ESE	24
K6ZKA	18
VE3XCS	18

Limited Multioperator

N2NT	126,900
KE8FD	65,272
W2MMD	65,010
VE3MIS	24,390
W3ZGD	19,600
WA3EKL	14,940
N3EXA	9,345
W1FM	3,528
W1OP	2,280
K2AA	2,000

Unlimited Multioperator

N3NGE	107,904
KD2LGX	83,080
N8GA	72,072
K5N	50,832
W4NH	42,160
WD9EXD	34,584
KE1LI	32,340
KE8RV	23,970
W1XM	17,640
AI7ID	11,960

William Stone, AB4DX, braved the winter elements during the 2025 ARRL January VHF Contest. He operated from Cheaha Mountain, the highest point in Alabama at 2,413 feet above sea level. He placed third overall in the Single Operator, Portable category. [William Stone, AB4DX, photo]

Affiliated Club Competition

Club	Score	Entries
Unlimited		
Mt. Airy VHF Radio Club	1,252,209	57
Ontario VHF Assn.	1,250,539	52
Medium		
North East Weak Signal Group	208,852	19
Potomac Valley Radio Club	161,657	40
Roadrunners Microwave Group	79,717	5
Fourlanders Contest Team	74,289	6
Frankford Radio Club	48,259	7
Kentucky Contest Group	39,931	3
Society of Midwest Contesters	33,534	19
Northern California Contest Club	33,229	13
Northern Lights Radio Soc.	31,029	24
Pacific Northwest VHF Soc.	30,959	21
Yankee Clipper Contest Club	29,999	11
Michigan VHF-UHF Soc.	18,574	7
Southern California Contest Club	18,165	6
Arizona Outlaws Contest Club	13,768	11
Florida Contest Group	12,422	6
Central Texas DX and Contest Club	7,606	4
Tennessee Contest Group	7,190	4
Alabama Contest Group	7,012	3
Swamp Fox Contest Group	6,536	4
DFW Contest Group	6,286	6
Mad River Radio Club	5,846	3
Florida Weak Signal Soc.	5,250	3
Niagara Frontier Radiosport	4,145	3
South Jersey Radio Assn.	4,075	6
Grand Mesa Contesters of Colorado	3,984	3
Contest Club Ontario	3,739	8
Texas DX Soc.	3,197	4
Convair/220 ARC	2,180	5
Willamette Valley DX Club	2,036	5
Carolina DX Assn.	1,770	3
Northeast Maryland Amateur Radio Contest Soc.	1,298	4
Local		
Eastern Connecticut ARA	35,648	5
Hilltop Transmitting Assn.	20,771	4
CTRI Contest Group	8,550	4
Bristol (TN) ARC	5,169	5
Jacksonville ARS	5,008	3

Full Results Online

You can read the full results of the contest online at **https://contests.arrl.org**. You'll find detailed analysis and more play-by-play, along with the full line scores. Improve your results by studying your log-checking report, too.

The 2026 ARRL January VHF Contest will be held January 17 – 19, 2026.

Regional Leaders

R = Classic Rover; RL = Limited Rover; RU = Unlimited Rover; SO-ALG-3B = Single Operator, Analog Only, Three-Band; SO-ALG-HP = Single Operator, Analog Only, High Power; SO-ALG-LP = Single Operator, Analog Only, Low Power; SO3B = Single Operator, Three-Band; SOFM = Single Operator, FM Only; SOHP = Single Operator, High Power; SOLP = Single Operator, Low Power; SOP = Single Operator, Portable; SOP-ALG = Single Operator, Portable, Analog Only; LM = Limited Multioperator, and UM = Unlimited Multioperator

West Coast Region

(Pacific, Northwestern, and Southwestern Divisions; Alberta, British Columbia, and NT Sections)

N6ZE/R	2,840	R	AG6X	11,045	SOLP	W1UO	18	SOP	KN7Y	91	SO-ALG-3B
KK6MC/R	924	R	N7IR	6,732	SOLP	W7JET	2,071	SOP-ALG	N7ITU	33	SO-ALG-3B
N6GP/R	4,234	RL	WZ8T	6,266	SOLP	KM6RNJ	637	SOP-ALG	KB6A	15	SO-ALG-3B
KA7RRA/R	1,728	RL	K6USY	4,216	SOLP	KF6CVA	84	SOP-ALG	AF6GM	504	SOFM
KD6EFQ/R	774	RL	KK7DS	1,680	SOLP	K6BCW	10	SOP-ALG	N1TEN	416	SOFM
K7BDB/R	460	RL	N6RO	4,875	SO-ALG-HP	AK6BA	2	SOP-ALG	KO6BT	252	SOFM
KN6ZOO/R	429	RL	K6WIS	3,135	SO-ALG-HP	W8JH	1,848	SO3B	N6DRE	234	SOFM
WC7M/R	340	RU	K6MI	7,840	SO-ALG-LP	KX7L	1,080	SO3B	N7WLC	48	SOFM
K6KLY	9,000	SOHP	NU6S	5,525	SO-ALG-LP	AA7EA	1,022	SO3B	WO1S	736	LM
N7EPD	5,520	SOHP	K2GMY	1,344	SO-ALG-LP	K9SAT	210	SO3B	AI7ID	11,960	UM
KD7UO	3,950	SOHP	KE7UQL	1,058	SO-ALG-LP	K3KHF	189	SO3B			
KW6S	3,007	SOHP	N4DLA	972	SO-ALG-LP	N7QOZ	2,088	SO-ALG-3B			
K7IU	2,024	SOHP	AF5T	1,404	SOP	WB7FJG	812	SO-ALG-3B			

Midwest Region

(Dakota, Midwest, Rocky Mountain, and West Gulf Divisions; Manitoba and Saskatchewan Sections)

N5ZY/R	2,366	R	WQ5S	4,992	SOHP	AIØH	518	SO-ALG-LP	KØPHP	918	SO3B
KA5D/R	31,500	RL	W9RM	3,723	SOHP	NØUK	400	SO-ALG-LP	KØVG	611	SO3B
W5TN/R	24,723	RL	KØAWU	3,680	SOHP	WØZF	330	SO-ALG-LP	N5UM	600	SO3B
NØSPN/R	576	RL	K5TRA	5,120	SOLP	KAØCRO	144	SO-ALG-LP	KEØQXV	210	SO-ALG-3B
WØRRC/R	396	RL	NØLD	3,680	SOLP	K5ND	4,944	SOP	NL7CO	44	SOFM
W5OC/R	280	RL	NØLL	2,583	SOLP	NØSUW	210	SOP	W5ESE	24	SOFM
KCØP/R	8,697	RU	KFØM	2,072	SOLP	NØJK	30	SOP	NØEO	176	LM
NØHZO/R	5,285	RU	AJ4F	1,032	SOLP	KI6HQT	4	SOP	KØERR	133	LM
AA5AM	7,973	SOHP	WØGHZ	7,744	SO-ALG-HP	W5TRL	18,094	SO3B	K4EMR	52	LM
N5RZ	5,350	SOHP	KAØPQW	528	SO-ALG-LP	K5MNZ	1,150	SO3B	K5N	50,832	UM

Central Region

(Central and Great Lakes Divisions; Ontario East, Ontario North, Ontario South, and Greater Toronto Area Sections)

VE3OIL/R	17,300	R	VE3SMA	9,073	SOLP	VE3EG	135	SO-ALG-LP	VE3XCS	18	SOFM
VA3ELE/R	2,356	RL	VA3IKE	8,127	SOLP	WX4WKY	378	SOP	N9PCS	6	SOFM
AK4U/R	624	RL	K8NVR	7,482	SOLP	WN1C	333	SOP-ALG	KC9TSZ	1	SOFM
W8ISS/R	580	RL	KE8R	4,370	SOLP	VE3FU	15	SOP-ALG	VE3OQP	1	SOFM
K9JK/R	400	RL	N8ECI	2,772	SOLP	KE8AKW	34,034	SO3B	KE8FD	65,272	LM
W9FZ/R	35	RL	VE3ZV	7,344	SO-ALG-HP	VA3FLF	1,755	SO3B	VE3MIS	24,390	LM
N8LRG	65,120	SOHP	VE3KG	5,148	SO-ALG-HP	KØPG	1,485	SO3B	KB9HV	1,768	LM
VE3WY	13,860	SOHP	VE3DS	25,550	SO-ALG-LP	ND8D	1,344	SO3B	N8GA	72,072	UM
VE3CKO	9,387	SOHP	VE3KH	3,808	SO-ALG-LP	W9LWO	810	SO3B	WD9EXD	34,584	UM
N4SV	8,118	SOHP	VE3RWJ	1,441	SO-ALG-LP	KO9A	525	SO-ALG-3B	KE8RV	23,970	UM
N2CB	7,952	SOHP	VE3WJ	624	SO-ALG-LP	VE3IQZ	160	SO-ALG-3B	W9YT	12	UM

Southeast Region

(Delta, Roanoke, and Southeastern Divisions)

K2EZ/R	61,110	R	N3MK	16,800	SOHP	WB4WXE	180	SO-ALG-LP	K3FR	3,422	SO3B
AG4V/R	24,009	R	W4MAA	11,387	SOLP	WU4G	16	SO-ALG-LP	WE9V	2,665	SO3B
KM4OZH/R	7,684	RL	KB4OLM	6,302	SOLP	K4NRT	15	SO-ALG-LP	KV4ZY	198	SO-ALG-3B
NV4B/R	6,200	RL	W4TM	4,635	SOLP	AD4SA	4	SO-ALG-LP	NJ4Q	20	SO-ALG-3B
KE4WMF/R	3,813	RL	W8BRY	3,472	SOLP	AB4DX	924	SOP	WB4TT	390	SOFM
W3IP	56,642	SOHP	WA4LDU	3,402	SOLP	WX4DAT	12	SOP-ALG	W2SI	10	SOFM
K3SK	35,934	SOHP	NT4RT	20	SO-ALG-HP	AJ6T	6,912	SO3B	W4NH	42,160	UM
N4QWZ	24,240	SOHP	K4BAI	1	SO-ALG-HP	NS4T	5,555	SO3B	N4BRF	8,176	UM
K4SO	18,323	SOHP	W4YN	266	SO-ALG-LP	N4HB	5,120	SO3B			

Northeast Region

(New England, Hudson, and Atlantic Divisions; Maritime and Quebec Sections)

KF2MR/R	81,054	R	WB2RVX	77,714	SOHP	WB2SIH	2,150	SO-ALG-LP	N1JD	405	SO-ALG-3B
KE2BUY/R	75,790	R	N2WK	98,685	SOLP	VA2VT	869	SOP	K2ZH	288	SO-ALG-3B
K2UA/R	71,116	R	WN3A	95,484	SOLP	N3YMS	6,624	SOP-ALG	AI1TT (W1WBB, op)	75	SO-ALG-3B
W2EV/R	38,480	R	NR2C	81,024	SOLP	N2MAK	2,300	SOP-ALG	W1NIV	129	SOFM
KØBAK/R	7,784	R	WA3NUF	63,551	SOLP	WB2AMU	315	SOP-ALG	KE2CCG	15	SOFM
KE5NJ/R	2,106	RL	N3RG	58,984	SOLP	N2YTF	120	SOP-ALG	N2NT	126,900	LM
K1UU/R	1,725	RL	W2FU	79,833	SO-ALG-HP	KK4YZG	48	SOP-ALG	W2MMD	65,010	LM
WA1PQY/R	230	RL	WZ1V	46,944	SO-ALG-HP	KQ2RP	48	SOP-ALG	W3ZGD	19,600	LM
WB2SIH/R	156	RL	W2KV	13,260	SO-ALG-HP	K1DC	12,122	SO3B	WA3EKL	14,940	LM
VO1IV/R	152	RL	KC3BVL	10,642	SO-ALG-HP	W3FAY	9,384	SO3B	N3EXA	9,345	LM
KG6CIH/R	45,676	RU	WA1PBU	9,840	SO-ALG-HP	N3ALN	6,068	SO3B	N3NGE	107,904	UM
N2JMH	247,380	SOHP	AF1T	94,184	SO-ALG-LP	NE2U	5,560	SO3B	KD2LGX	83,080	UM
K1TEO	111,573	SOHP	WB2JAY	12,144	SO-ALG-LP	KD2CDV	4,370	SO3B	KE1LI	32,340	UM
K1RZ	99,314	SOHP	WB2VVV	7,298	SO-ALG-LP	W1SRH	768	SO-ALG-3B	W1XM	17,640	UM
K2TER	84,084	SOHP	AC1J	2,688	SO-ALG-LP	W1TR	468	SO-ALG-3B	KV1J	11,658	UM

Division Winners

Classic Rover

Atlantic	KF2MR/R	81,054
Delta	K2EZ/R	61,110
New England	WS1O/R	896
Southwestern	N6ZE/R	2,840
West Gulf	N5ZY/R	2,366
Canada	VE3OIL/R	17,300

Limited Rover

Atlantic	KE5NJ/R	2,106
Central	K9JK/R	400
Dakota	NØSPN/R	576
Delta	NV4B/R	6,200
Great Lakes	AK4U/R	624
Hudson	WB2SIH/R	156
New England	K1UU/R	1,725
Northwestern	KA7RRA/R	1,728
Roanoke	KM4OZH/R	7,684
Rocky Mountain	WØWLA/R	72
Southwestern	N6GP/R	4,234
West Gulf	KA5D/R	31,500
Canada	VA3ELE/R	2,356

Unlimited Rover

Atlantic	KG6CIH/R	45,676
Dakota	KCØP/R	8,697
Northwestern	WC7M/R	340

Single Operator, High Power

Atlantic	N2JMH	247,380
Central	N4SV	8,118
Dakota	KØAWU	3,680
Delta	N4QWZ	24,240
Great Lakes	N8LRG	65,120
Hudson	WA2FZW	15,420
Midwest	KØTPP	2,475
New England	K1TEO	111,573
Northwestern	N7EPD	5,520
Pacific	K6KLY	9,000
Roanoke	W3IP	56,642
Rocky Mountain	W9RM	3,723
Southeastern	WB2FKO	10,703
Southwestern	KE7GRO	1,725
West Gulf	AA5AM	7,973
Canada	VE3WY	13,860

Single Operator, Low Power

Atlantic	N2WK	98,685
Central	KB9RUG	2,146
Dakota	WØADL	888
Delta	AA4DD	3,198
Great Lakes	K8NVR	7,482
Hudson	N2YU	3,094
Midwest	NØLL	2,583
New England	N1YCQ	9,576
Northwestern	WZ8T	6,266
Pacific	K6USY	4,216
Roanoke	KB4OLM	6,302
Rocky Mountain	NJ7A	546
Southeastern	W4MAA	11,387
Southwestern	AG6X	11,045
West Gulf	K5TRA	5,120
Canada	VE3SMA	9,073

Single Operator, Analog Only, High Power

Atlantic	W2FU	79,833
Dakota	WØGHZ	7,744
Hudson	W2KV	13,260
New England	WZ1V	46,944
Pacific	N6RO	4,875
Roanoke	NT4RT	20
Southeastern	K4BAI	1
Canada	VE3ZV	7,344

Single Operator, Analog Only, Low Power

Atlantic	KD2HZI	1,800
Dakota	KAØPQW	528
Delta	K4NRT	15
Hudson	WB2JAY	12,144
New England	AF1T	94,184
Northwestern	K7CX	804
Pacific	K6MI	7,840
Roanoke	W4YN	266
Rocky Mountain	WJ7L	84
Southeastern	WB4WXE	180
Southwestern	N7RK	660
West Gulf	WA5LFD	12
Canada	VE3DS	25,550

Single Operator, Portable

Dakota	NØSUW	210
Great Lakes	WX4WKY	378
Midwest	NØJK	30
Southeastern	AB4DX	924
Southwestern	AF5T	1,404
West Gulf	K5ND	4,944
Canada	VA2VT	869

Single Operator, Portable, Analog Only

Atlantic	N3YMS	6,624
Central	WN1C	333
Hudson	WB2AMU	315
Pacific	KF6CVA	84
Roanoke	WX4DAT	12
Southwestern	W7JET	2,071
Canada	VE3FU	15

Single Operator, Three-Band

Atlantic	W3FAY	9,384
Central	KØPG	1,485
Dakota	KØVG	611
Delta	AJ6T	6,912
Great Lakes	KE8AKW	34,034
Hudson	NA2NY	3,348
Midwest	KØPHP	918
New England	K1DC	12,122
Northwestern	KX7L	1,080
Pacific	N7VAZ	28
Pacific	KA5WSS	28
Roanoke	N4HB	5,120
Rocky Mountain	AD7OV	110
Southeastern	NS4T	5,555
Southwestern	W8JH	1,848
West Gulf	W5TRL	18,094
Canada	VA3FLF	1,755

Single Operator, Analog Only, Three-Band

Atlantic	K2ZH	288
Central	KO9A	525
Dakota	KEØQXV	210
Hudson	WI2M	1
New England	W1SRH	768
Northwestern	N7QOZ	2,088
Roanoke	KV4ZY	198
Southwestern	KN7Y	91
Canada	VE3IQZ	160

Single Operator, FM Only

Central	N9PCS	6
Hudson	KE2CCG	15
New England	W1NIV	129
Northwestern	KK7OIM	6
Pacific	K6ZKA	18
Roanoke	WB4TT	390
Southeastern	W2SI	10
Southwestern	AF6GM	504
West Gulf	NL7CO	44
Canada	VE3XCS	18

Limited Multioperator

Atlantic	W2MMD	65,010
Central	KB9HV	1,768
Dakota	NØEO	176
Great Lakes	KE8FD	65,272
Hudson	N2NT	126,900
New England	W1FM	3,528
Rocky Mountain	K4EMR	52
Southwestern	WO1S	736
Canada	VE3MIS	24,390

Unlimited Multioperator

Atlantic	N3NGE	107,904
Central	WD9EXD	34,584
Great Lakes	N8GA	72,072
New England	KE1LI	32,340
Northwestern	AI7ID	11,960
Southeastern	W4NH	42,160
West Gulf	K5N	50,832

New Books

A Short History of Communication Receivers in Functional Diagrams: 1929 – 1983

Kurt Bergmann, Joachim Rockschies, and Heinrich Spanknebel

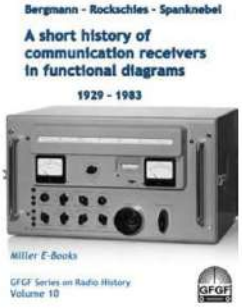
Reviewed by Edward Durrant, DD5LP

This technical reference uses technical diagrams to explain how certain radio models worked and the progression of the technologies used between 1929 and 1983. Many of the diagrams have not been recreated, and contain German text with English translations underneath the diagrams.

Each chapter briefly describes a particular receiver design method and gives examples of radios utilizing that technology. It provides block diagrams of the stages for the specific radio model. Any changes from the standard radio design are covered in text.

The radios featured are mostly German, like Telefunken, Lorenz, Siemens, Sommerkamp, etc.

However, there are US models, including National HRO, Hallicrafters, Hammarlund, Collins, Drake, etc., and other international models, such as Yaesu, Kenwood, and Racal receivers.



[Photo courtesy of Miller E-Books]

The summaries are a valuable resource for readers who want to learn the differences between these receivers. This book is a high-level tool for readers to decide between different radios for restoration. Its consistent and straightforward format makes it easy to reference the data from different radios.

Special Event Stations

Working special event stations is an enjoyable way to help commemorate history.Many provide a special QSL card or certificate!

June 14, 1830Z – 2030Z, W9ZL, Appleton, WI. Fox Cities Amateur Radio Club. **Appleton Flag Day Parade**. 14.246. QSL. FCARC, P.O. Box 2346, Appleton, WI 54912. **www.fcarc.club**

June 21 – June 22, 1504Z – 1504Z, KFØMSJ, Washington, MO. Zero Beaters Amateur Radio Club. **152nd Birthday of Indian Prairie School**. 14.330. QSL. Greg Ballard, 662 E. Main St., Union, MO 63084. **www.zerobeaters.org**

June 29 – July 3, 1300Z – 0500Z, K2BSA/8, Metamora, MI. Garden City Amateur Radio Club. **Boy Scouts of America/Michigan Crossroads Council — Trail to Eagle**. 3.840 7.270 14.330. QSL. GCARC, P.O. Box 482, Garden City, MI 48136. **https://michiganscouting.org/camping/trail-to-eagle**

July 1 – July 8, 1300Z – 0400Z, WM3PEN, Philadelphia, PA. Holmesburg Amateur Radio Club. **13 Colonies Special Event**. 7.276 14.276. QSL. Holmesburg Amateur Radio Club, 3341 Sheffield Ave., Philadelphia, PA 19136. **www.qrz.com/db/wm3pen**, **www.wm3pen.org**, or **www.13colonies.us**

July 4 – July 7, 0000Z – 0000Z, WØH, Jackson, OH. White House Communications Agency Amateur Radio Club. **The White House Communications Agency Amateur Radio Club Independence Day 2025 Celebration Special Event**. 3.875 7.275 14.250 28.550. Certificate. Lowell Yates, 6809 Four Mile Rd., Jackson, OH 45640. **www.whitehousecomms-arc.org**

July 5, 1400Z – 1800Z, W3G, Erie, PA. Radio Association of Erie. **The Radio Association of Erie's 80th Birthday**. 14.321 28.345. QSL. W3GV, P.O. Box 8931, Erie, PA 16505. **www.w3gv.org**

July 5, 1400Z – 2000Z, K4RC, Williamsburg, VA. Williamsburg Area Amateur Radio Club. **Colonial Williamsburg Special Event Station**. 7.265 14.265. Certificate & QSL. QSL Manager, WAARC, P.O. Box 1470, Williamsburg, VA 23187. *The Virginia Historic Triangle Certificate is available for working the Jamestown, Williamsburg, and Yorktown Special Event Stations*. **www.k4rc.net/events/special-event-stations**

July 5 – July 19, 1400Z – 1400Z, W4B, Dayton, TN. Rhea County Amateur Radio Club. **Scope's "Monkey" Trial 100th Anniversary**. 7.045 7.205 14.045 14.265. Certificate. Rob Frailing, 664 Lone Mountain Dr., Dayton, TN 37321. **www.facebook.com/RheaCountyAmateurRadioClub**

July 11 – July 27, 0000Z – 2359Z, K6C, Sacramento, CA. ARRL Sacramento Valley Section. **California State Fair**. 7.290 14.290 21.390 28.390. Certificate. Carol Milazzo, P.O. Box 665, Citrus Heights, CA 95611-0665. **www.arrlsacvalley.org**

July 12, 1600Z – 2300Z, NI6IW, San Diego, CA. USS *Midway* Museum Ship. **United States Independence Day**. 7.250 14.320; 14.070 PSK31 D-STAR on PAPA System Repeaters. QSL. USS *Midway* Museum Ship COMEDTRA, 910 N. Harbor Dr., San Diego, CA 92101. **www.qrz.com/db/ni6iw**

July 14 – July 19, 0000Z – 2359Z, NJ2KC, Bridgeton, NJ. New Jersey Knights of Columbus Amateur Radio Club. **Our Lady of Mount Carmel Festival 150th Anniversary**. 7.250 14.350 21.350 28.450. Certificate & QSL. Thomas M. Perrotti, N2JIE, 785 Vineland Ave., Bridgeton, NJ 08302. **www.nj2kc.org**

July 14 – July 20, 2200Z – 0200Z, W4H, Boonville, IN. Warrick AuxComm. **Warrick County 4-H Fair**. 14.320 SSB. QSL. Steve Connaughton, 7677 Jenner Rd., Chandler, IN 47610. *Additional frequencies and modes may be used depending on band and weather conditions. Operating times will be mostly late afternoons and evenings Central Time*. **www.warrickauxcomm.org**

July 18 – July 21, 1300Z – 2200Z, W3A, Hunt Valley, MD. Amateur Radio Club of the National Electronics Museum. **Commemoration of Apollo 11 Live TV from the Moon that Allowed the World to See Mankind's First Steps on the Lunar Surface**. 7.069 7.269 14.069 14.269. Certificate & QSL. ARCNEM, 338 Clubhouse Rd., Hunt Valley, MD 21031. *Operation on 80 meters (3.569, 3.869) and digital modes possible during the event*. **www.ww-2.us**

July 19, 1330Z – 2100Z, K3S, Port of Baltimore, MD. Nuclear Ship *Savannah* Amateur Radio Club. **NS *Savannah* Launch Anniversary**. 7, 14, 18, 21, 28. QSL. Ulis Fleming, 980 Patuxent Rd., Odenton, MD 21113. *Check spotting networks*. **www.qrz.com/db/k3s**

July 19 – July 20, 1300Z – 0100Z, W8H, Hinckley, OH. North Coast Amateur Radio Club. **Hinckley Township, Ohio, Bicentennial**. 7.185 14.240 18.150 28.390. Certificate. Download available 30 days after event, instructions on website. **ncarc@n8nc.org** or **www.n8nc.org**

July 19 – July 20, 1500Z – 1500Z, KD9NJR, Hoffman Estates, IL. Salvation Army Team Emergency Radio Network. **36th Anniversary of SATERN**. 3.820 7.265. Certificate & QSL. Salvation Army Central Territory Headquarters. SATERN Team Don Dewar, 5550 Prairie Stone Pkwy., Hoffman Estates, IL 60192.

July 21 – July 27, 0000Z – 0300Z, W4H, Albion, NY. Orleans County Amateur Radio Club. **Orleans County 4-H Fair**. 7.210. QSL. Terry Cook, 14069 W. County House Rd., Albion, NY 14411. **www.ocarc.us**

July 24 – July 26, 0400Z – 1000Z, K4HSN, Paris, KY. Harrison County Amateur Radio Club. **Central Kentucky Antique Farm Machinery Show**. 7.250 14.310 28.550. QSL. K4HSN c/o C.J. Clifford, 58 Ky Highway 3003, Cynthiana, KY 41031. **www.qrz.com/db/k4hsn**

July 26 – July 27, 1500Z – 0100Z, W6B, Bodie State Historic Park, CA. Bodie Foundation. **Friends of Bodie Living History Day**. 7.185 14.235 21.235 28.310. Certificate. John F. Pinckney, 139 Belle Boyd Blvd., Inwood, WV 25428. *POTA# K-3410. No souvenir cards. SWL reports must include call of station in QSO.*

Certificates and QSL cards: To obtain a certificate from any of the special event stations offering them, send your QSO information along with a 9 × 12-inch self-addressed, stamped envelope (3 units of postage) to the address listed in the announcement. To receive a special event QSL card (when offered), be sure to include a self-addressed, stamped business envelope along with your QSL card and QSO information.

Special Events Announcements: For items to be listed in this column, use the ARRL Special Events Listing Form at **www.arrl.org/special-events-application**, or email information to **events@arrl.org**.

Submissions must be received by ARRL HQ no later than the 1st of the second month preceding the publication date; a special event listing for **October** *QST* would have to be received by **August 1.** In addition to being listed in *QST*, your event will be listed on the ARRL Web Special Event page. Note: All received events are acknowledged. If you do not receive an acknowledgment within a few days, please contact us. ARRL reserves the right to exclude events of a commercial or political nature.

You can view all received Special Events at **www.arrl.org/special-event-stations**.

The 2025 ARRL 222 MHz and Up Distance Contest

1800 UTC Saturday, August 2 – 1759 UTC Sunday, August 3, 2025

The objective in this distance-scored event is to make as many contacts as possible on 222 MHz up to 241 GHz using terrestrial means (no EME contacts) over as great a distance in kilometers as possible. Participants will exchange six-digit grid locators, and distances will be based on the center-to-center distance between the two stations' six-digit locators. Visit **http://k7fry.com/grid** for a grid mapping and distance tool, courtesy of Steve Fry, K7FRY.

The three station categories are: Single Operator, Fixed; Multioperator, Fixed, and Rover. Rover stations may be worked from each four-character grid square in which they operate. If more than one contact on a given band is made between stations in specific grid squares, then the contact with the longest path will be counted. All stations exchange six-digit grid locators on as many bands as possible, but Rover stations can re-contact stations when they move to a new four-digit grid square. Attempts to increase contact distances are encouraged, and all contacts should be logged (even duplicates, to ensure that a valid contact isn't lost).

There are no power categories. Competition is by region. There is also a Club Competition and Team Competition. Be sure to register your team at **https://contests.arrl.org/teamreg.php?eid=1** before the contest begins.

Joe Olsen, AAØBV, combined his 222 MHz and Up Contest operation with a SOTA activation at Mendocino National Forest in California. Joe operated 222 MHz, 432 MHz, and 1.2 GHz. [Joe Olsen, AAØBV, photo]

Each band has a unique band factor value. Total score is the sum of all QSO points.

Only electronic, Cabrillo-formatted logs will be accepted (significant distance scoring calculations must be made to each QSO). Upload logs to **http://contest-log-submission.arrl.org**. The submission deadline is 1759 UTC August 17, 2025. You can share your photos and stories via the ARRL Contest Soapbox at **https://contests.arrl.org/222/soaps** or by scanning the QR code.

For specific scoring details and event rules, see www.arrl.org/222-mhz-and-up-distance-contest.

August 2025 ARRL Rookie Roundup — RTTY

1800 UTC – 2359 UTC, Sunday, August 17, 2025

Rookies make as many contacts as possible during this 6-hour event. Rookies work everyone, and non-Rookies work only Rookies. The exchange is your name, call sign, a two-digit year, and state (US or Mexican), Canadian province, or "DX."

You can enter as a Rookie if:

- You were first licensed this year or in the previous 3 calendar years (send the last two digits of the year you were first licensed in the exchange);
- You were licensed before 2022 and made your first-ever contact during 2025, 2024, 2023, or 2022; or
- You haven't made any contacts on the contest mode (RTTY) before (send the current year in your exchange.

Rookies can enter as a Single Operator or invite Rookie friends over and operate as Multioperator. Up to five Single Operator Rookies can also enter from their individual stations and submit their total score as a team.

Non-Rookies can join the fun by calling "CQ Rookies," to encourage the Rookie operators to call them.

All scores must be reported within 72 hours after the event. No late entries will be accepted. You can share your photos and stories via the ARRL Contest Soapbox at **https://contests.arrl.org/rrrtty/soaps** or by scanning the QR code.

Complete rules, logging sheets, and links for submitting your score can be found at www.arrl.org/rookie-roundup.

Volunteer Monitor Program Report

The Volunteer Monitor (VM) Program is a joint initiative between ARRL and the FCC to enhance compliance in the Amateur Radio Service. This is the April 2025 activity report of the VM Program.

♦ A traffic and awards net operating on 7.185 MHz was issued an advisory for deliberately starting the net on top of the Andaman Island DXpedition, VU4AX.

♦ A case involving an Alabama station continuously calling another station on 20-meter FT8 was resolved informally and the robotic one-way transmissions stopped.

♦ Technician operators in Texas and Michigan were issued advisories for operating FT8 on 40 meters. Technicians have only CW privileges on that band.

♦ A Technician operator in Florida was issued an advisory for FT8 operation on 15 meters. Technicians have only CW privileges on that band.

♦ A Technician operator in Iowa was issued an advisory for FT8 operation on 20 meters, a band on which Technicians have no privileges.

♦ A commendation was issued to a station in Colorado for exemplary net control operation on 14.295 MHz on February 16, 2025, from 1600 – 1800 UTC, in which he demonstrated exceptional courtesy and efficiency in checking in stations under crowded band conditions.

♦ A commendation was issued to an operator in North Carolina for exceptional CW QRP operation on 7.025 MHz from 0100 – 0120 UTC on April 5, 2025. The operator demonstrated exceptional courtesy and efficiency in making contacts with numerous operators under crowded band conditions.

♦ A question-and-answer session was presented in person to the Mt. Airy VHF Radio Club in Mt. Airy, Pennsylvania. A virtual VM program was presented to the Bella Vista Amateur Radio Club in Rogers, Arkansas.

The totals for March 2025 monitoring were 1,480 hours on HF frequencies, and 1,849 hours on VHF frequencies and above, for a total of 3,329 hours. — *Thanks to Volunteer Monitor Program Administrator Riley Hollingsworth, K4ZDH*

Mike Walters, W8ZY, w8zy@arrl.org

Club Station

An Antenna-Building Party for New Hams

Many clubs find that it can be difficult to retain newly licensed members who don't know where to start, or who might be nervous getting on the air, among other reasons. In this month's column, Garland Amateur Radio Club (GARC), K5QHD, member Randy Brack, N5MRB, shares how the Texas club has found success remedying these concerns by hosting antenna parties.

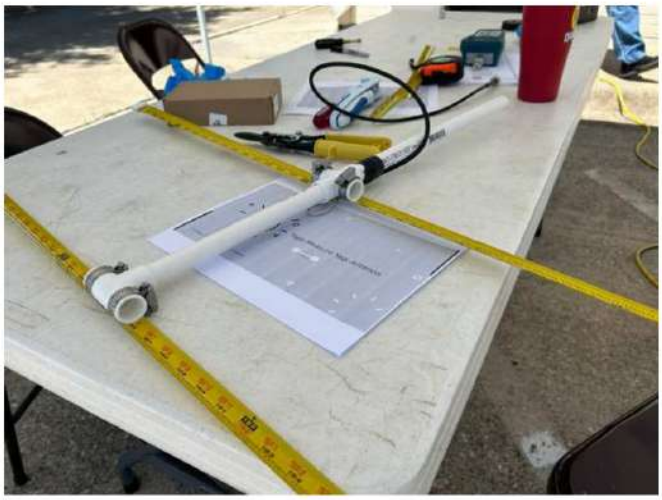
GARC teaches two or three Technician and two General license classes annually, and offers Amateur Extra classes every other year. One of the students, Alex Varas, KJ5EYK, suggested to GARC Vice President Joaquin Cruz, KI5WZV, that the club host an antenna-building event geared toward newly licensed hams to help them get involved in the hobby.

Students who take the Technician license class through GARC and subsequently earn a license are offered a free 1-year membership. However, club officers began noticing that many of these recipients rarely became active. Joaquin and GARC Education Officer John Abbott, KF5FWK, decided that a hands-on event for students to build their own antennas might increase their enthusiasm in the hobby and help the club retain new-ham members.

During GARC's Technician license class, the club's education staff uses a two-element, 2-meter handheld Yagi antenna as part of a demonstration, so it was only fitting that it be the antenna built during the event. Attendees could also use it for foxhunting or finding a repeater. The event had two purposes: to get new hams involved, and to show that operating a radio isn't all you can do with your license — you can experiment, too.

Event Prep

John invited every student from GARC's 2024 classes to attend but received only four RSVPs. Joaquin still purchased enough parts to assemble 10 antennas. The parts were then separated into individual $12 kits that attendees would purchase when they arrived (see Table 1). GARC provided solder, 18-gauge solid copper wire, and all other necessary tools.



The completed Yagi antenna. [Amado Pereira, KJ5DGS, photo]

We decided on the Garland Amateur Radio Club Communications Center (GARCCC) as the event location. Inside the center is one wall filled with radio and other equipment, a whiteboard and video display at the front of the room, and four 2 × 6-foot tables arranged classroom-style to accommodate 16 students (but when equipment is spread out on the tables, space is at a premium).

To allow extra room for students to cut their PVC pipes and tape measures, we planned to put one table under a canopy in the parking lot. This would allow builders to do all their cutting, as well as assembly of their PVC pipes, first. Then they could go inside GARCCC to complete the assembly using the smaller parts.

Table 1 — Antenna Kit Materials List

Materials
24" of ½" schedule 40 PVC pipe
Four stainless-steel hose clamps big enough to fit around the PVC pipe
½" PVC tee
½" PVC cross
4' of RG-8X cable
One PL-259 crimp-on connector
One metal tape measure

Joaquin Cruz, KI5WZV (on the right), gives Juliette Reeder, KJ5HNX, tips on soldering. [Amado Pereira, KJ5DGS, photo]

About half a dozen members agreed to be in attendance as mentors.

Successful Turnout

The event was held on August 3, 2024, at 1200 – 1600 CST. It was a good thing that Joaquin purchased more parts, because eight people showed up: seven hams and one non-ham curious about the hobby. One of the attendees was blind ham Bill Herzler, W5BLT, who already had his Amateur Extra license but had audited the classes as refreshers and wanted to build an antenna by hand. One of the new ham attendees, Jim Stevens, KJ5HNP, said he attended the event "to learn about antennas and to put the antenna into practice to find the repeater."

Upon arrival, each student purchased an antenna kit. Dave Gross, W6JDG, with assistance from Ken Young, W5KYZ, spent time outside helping students measure and cut their PVC pipes and tape measures to the correct lengths. Joaquin went back and forth between the inside and outside areas.

Once students came inside, they were ready to assemble their antennas. Putting the parts together was simple, but many students had never soldered before. Mentors were available to help if needed. New ham Jim Ashmore, W5AAQ, enjoyed the assembly process, stating that it "brought a whole lot of skills together." The average time spent building an antenna, from start to finish, was about an hour. Some of the extra parts that Joaquin bought were used as replacements for students who made mistakes during assembly.

Once each student finished building their antenna, they went back out to the parking lot to test and tune it. Using a RigExpert AA-650 ZOOM or Comet CAA-500 Mark II antenna analyzer, they set the SWR, tuning the antenna to the club's low-power radio transmitter (known as a *fox*) at 146.565 MHz, and fine-tuned their antennas by moving the elements and the induction loop. Students also had the option of finding GARC's main VHF repeater at 146.660 MHz and experiencing polarity testing.

Although the event was scheduled to end at 1500 CST, it ran until 1600 CST because of student interest.

After-Action Report

The GARC education team was happy with the results of the antenna party. "Students were surprised at how much fun it was," Joaquin said. "The[y] had a lot more enthusiasm than we anticipated." The non-ham attendee enjoyed the event and hobby so much that they decided to get their license!

We learned that it's important to ask students and new hams what interests them, as their ideas can be valuable tools in recruitment and retention. Also, we found that because it was a hands-on activity, students asked questions more freely than they did in license classes.

GARC plans to hold a copper pipe J-pole assembly session in the future, and one new ham has already committed to attend. Also, an unun-building party is planned for after GARC's next General license class.

ARRL Special Service Clubs

ARRL offers the Special Service Club (SSC) program for clubs that demonstrate that they're working to improve the amateur radio community by completing special projects, holding license classes, and working with local groups on events, among other activities. Visit **www.arrl.org/ssc-application** for more information about this program. Below is a list of new and renewing SSCs as of March 27, 2025.

Renewing SSCs

Denton County ARA, W5NGU	Denton, TX
Holmesburg ARC, WM3PEN	Philadelphia, PA
McKinney ARC, W5MRC	McKinney, TX
Nashoba Valley ARC, N1NC	Pepperell, MA
Orange County ARC, W6ZE	Tustin, CA
Riverland ARC, W9UP	Onalaska, WI
Silvercreek ARA, W8WKY	Norton, OH
South Mountain Radio Amateurs, N3TWT	Mechanicsburg, PA

Sign Up for ARRL Club News

Read the monthly *ARRL Club News* e-newsletter to find out more about what clubs are doing to advance amateur radio in their communities and within the hobby. To opt in to monthly email delivery of *ARRL Club News*, log in to **www.arrl.org** and select "E-Newsletters and Notifications" on your account web page.

Steve Goodgame, K5ATA, sgoodgame@arrl.org

Ham Media Playlist

HamJazz

Simon Stribling, VA7BIX, otherwise known as "HamJazz" on YouTube, first landed on my radar during the second annual Teachers Institute telethon hosted by Josh Nass, KI6NAZ (**www.youtube.com/@HamRadioCrashCourse**), and Mike Dahlhofer, K8MRD (**www.youtube.com/@hamradiotube**). It was during the telethon that I noted Simon has a great sense of humor and likes making interesting antennas. I dug a little deeper into his YouTube channel, HamJazz (**www.youtube.com/@thehamjazz**), and I am glad that I did!

Simon, VA7BIX, shows part of his tape measure antenna.

Bitten by the Radio Bug

Early on, Simon enjoyed 11 meters. He grew up in North East Victoria, Australia, and in the early 1980s he ventured into the world of CB radio. He was amazed to be able to communicate over thousands of kilometers, even using his low-power radio, and he vividly remembers being bitten by the DX bug. One morning before school in 1982, Simon turned on his radio and couldn't believe what he heard. DX stations were roaring in from the US. He made his first contact with a CBer who went by SC1 in Washington, DC. Simon describes that contact as "electric" and has saved the QSL card throughout the years.

Simon was around radios all the time, as they were used for everyday communication on the farm; however, his uncle Ian, VK3AZP, lit the spark for Simon to venture into the world of amateur radio. Ian was a frugal man and rarely purchased any equipment, choosing instead to build it on his own. Simon had the opportunity to observe Ian creating some of his gear, and he found himself getting pulled in.

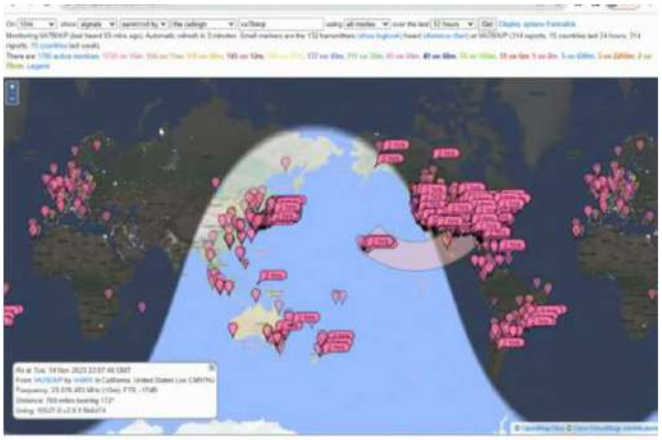
Simon first began creating YouTube content in 2022. He was watching Mike's, K8MRD, videos about Parks on the Air® (POTA®) and got hooked on the activity. Simon found himself struggling to make contacts with his antenna until one of his mentors, Mike, VE7GHZ, from Burnaby Radio, gave him a simple hamstick antenna. The difference was astounding. His POTA activations went from being an all-day affair trying to get 10 contacts for an activation, to having hours of pileups every time he was on the air. Seeing the fun Mike, K8MRD, was having making content doing what he loved, Simon decided he wanted to do the same, and HamJazz was born.

Simon, VA7BIX, gets on the air using his portable Yagi antenna.

Creating Antennas from Everyday Objects

Many hams have built tape measure antennas — but probably not like the one Simon builds in his video titled "This Tape Measure Hack Will Blow Your Mind!"

Simon, VA7BIX, demonstrates one possible way to hide the radials of his stealth antenna.



Simon, VA7BIX, shows viewers the effectiveness of his stealth antenna using PSKReporter.

(**https://tinyurl.com/hamjazz-tape**). When someone mentions using a tape measure as an antenna, most hams think of the tried-and-true tape measure Yagi. Simon embraces the spirit of creating an antenna from everyday objects that are likely to be in every ham's shack.

Simon gives viewers a look at the setup of the antenna before filming his activation. By adjusting the length of the tape measure, he is able to achieve 1:1 SWR on multiple bands. Judging from the pileups Simon is working, the antenna works like a champ.

Antenna Builds

Simon's most popular videos are his antenna-building videos, which include very unconventional antenna builds. Another great video is titled "10-20 Meters, One Antenna: BEAM" (**https://tinyurl.com/hamjazz-beam**), for which PVC pipe and tent poles serve as the beginning of this interesting project. Simon is the first to admit that this is a work in progress, but it ends up performing quite well. This antenna, designed to be a portable antenna for POTA and other portable operations, is relatively easy to assemble in the field.

As the video progresses, Simon demonstrates the effectiveness of the antenna by manually turning the beam, allowing viewers to hear the signal improve as the antenna turns toward the station. One great thing about this video, and all of Simon's videos, is that when something needs to be adjusted or something does not work as expected, he doesn't hide it. Instead, he discusses what he is doing to make adjustments.

Stealth Antennas

Sometimes hams need to be a bit stealthy, especially when there is an HOA involved. True to his roots, Simon builds a stealth antenna using jewelry wire as the element in his video titled "Stealth HOA Antenna" (**https://tinyurl.com/hamjazz-hoa**). Simon demonstrates how to hang the wire on the eaves of his house. When it comes to the radials, he gives viewers tips on how to make them less obvious, including hiding them in decking, covering them with a rug, etc.

Simon gets on the air using his creation, allowing viewers to witness the process. He operates FT8 and works stations in the US, Asiatic Russia, and Japan. He then looks at PSKReporter to see where he was heard. The antenna lived up to Simon's hopes, as he was heard around the world.

Simon runs a great YouTube channel, and his excitement is infectious. One of his regular parks to operate from is Cattle Point/Uplands Park, where people regularly walk by, sometimes looking at him strangely and other times asking questions, giving him the opportunity to share a bit about amateur radio.

If you find yourself in a mood to tinker and create something from scratch, take a look at Simon's channel. You'll be happy that you did.

Feedback

In "The Newport Antenna Shootout" in the May 2025 issue, the data in Tables 1 and 2 are reversed. The complete antenna shootout results are given in Table 2, and the results with Europe data removed are given in Table 1. This has since been corrected in the digital edition.

Bernie McClenny, W3UR, w3ur@arrl.org

How's DX?

July Is IOTA Month

DXers participating in the Islands on the Air (IOTA) program, sponsored by Islands on the Air Ltd., are aware that July marks IOTA month. This period is considered optimal for working new IOTA entities, or *counters*. Many operators in the Northern Hemisphere engage in IOTA DXpeditions at this time, especially during the Radio Society of Great Britain (RSGB) IOTA Contest, held on the last full weekend of the month. Participation in this annual event continues to increase. During the contest, beginners in the IOTA award program can aim to achieve their first 100 counters, while more experienced operators may exceed working 200. This year's contest will take place on July 26 and 27. For the complete rules, visit **www.rsgbcc.org/hf/rules/2025/riota.shtml**. For a list of planned IOTA contest activities, refer to Bill Feidt's, NG3K, RSGB IOTA Contest Announced Operations web page at **www.ng3k.com/misc/iota2025.html**.

IOTA NA-090

Members of the Asociación de Radioaficionados de Venezuela and the Grupo DX Caracas are organizing a joint IOTA DXpedition to Chimana Segunda Island, part of Mochima National Park. This DXpedition will be recognized as part of the Anzoátegui State/Sucre State West Group SA-090, and participants will operate as YW6A on June 20 – 24. This event is also valid for Parks on the Air® (VE-0011), World Lighthouse on the Air (WLOTA-2062), and Beaches on the Air. Operations will be on SSB, CW, digital modes, and satellites. QSL information is available via W4DTA. You can read more about the DXpedition at **www.radioclubvenezolano.org/concurso.htm**.

IOTA AS-114

A team of Russian radio operators, led by Eugene, RZ3EC, and including Igor, UA3EDQ; Gennady, R3BY; Max, RU5D; Sergey, RU3EG; Andy, R5EM, and Serge, RW3XA, will be operating as RIØCR from Ustrichnyy Island (AS-114) on July 15 – 20. Please send QSL requests to RZ3EC.

DX News from Around the World

7Q — Malawi

In June, Don, K6ZO (7Q6M); Bill, KC4D (7Q7WW), and Jerry, W1IE (7Q2T), will return to Malawi to set up a computer lab and amateur radio club station at the CDSS Secondary School in Embangweni. The classroom will have 20 computers, and three resident hams will be attending the school: Blessings Msimuko, 7Q5BM; Urgent Jere, 7Q6UJ, and Abraham Moyo, 7Q4AM. The US operators are seeking transceivers, computers, amplifiers, and headsets, and they're aiming to raise $4,300. For more information, visit **www.w3hac.org/project-malawi**. Donations can be mailed to the HacDC Amateur Radio Club, c/o Carl Bergman at 1301 Geranium Ave. NW, Washington, DC 20012, and marked as "Project Malawi."

FO — French Polynesia

Nobby, FO/GØVJG, will return to Bora Bora on June 11 – 27. He will be active on HF and 6 meters.

FP — St. Pierre and Miquelon

Eric, KV1J, is dedicating his 17th trip to Miquelon Island to the memory of Jean-Pierre, FP5CJ (SK), who passed away in September 2024. Jean-Pierre helped many hams operate from FP. Eric will be active as FP/KV1J on June 28 – July 14, which includes the 2025 International Amateur Radio Union HF World Championship. He will operate on 80 – 6 meters using SSB, CW, FT8, and FT4, with an Elecraft K3, an Icom IC-7300, and a Heathkit SB-200 amplifier. Eric's antennas will include an off-center-fed dipole for 80 – 10 meters, a five-band Spiderbeam, a wire Yagi beam for 20 – 10 meters, a vertical for 60 meters, and a three-element 6-meter Yagi. You can QSL directly, or via bureau to KV1J, Logbook of The World® (LoTW®), Club Log's Online QSL Request System, or eQSL.cc. More details can be found on Eric's website at **www.kv1j.com/fp/July25.html**.

J3 — Grenada

Graham, 2MØIJU, and Eric, GM5RDX, will be operating from Grenada on July 5 – 13. Eric has been assigned the call sign J38DX, and Graham will use

J38LD when it is issued to him. They will primarily use SSB, with some FT8, and their base of operations will be a cliffside cottage on the southern side of the island. They plan to use various wire verticals and dipoles. While the transmitters have not been finalized, Eric and Graham intend to operate on all amateur bands from 80 to 10 meters at up to 100 W.

JD1/O — Ogasawara Islands

Koutarou, JP1IHD, has announced that his next operation as JD1BQP will take place from Chichijima in mid-June. Listen for him on 20 – 6 meters, with a primary focus on 6 meters.

JW — Svalbard

Vladimir Zencak, OK2WX, will operate as JWØV in Longyearbyen on July 14 – 23. He'll use an Elecraft K4, an ELAD Duo, an SPE Expert 1.3K, a JUMA amplifier (up to 1200 W), a 40 – 10-meter SteppIR antenna, an inverted **V**, and a six-element 6-meter Yagi. Vladimir will be on CW, SSB, and FT8. QSL via I8KHC or LoTW.

TG — Guatemala

Todd, AF4CZ, will be active as TG9/AF4CZ in Guatemala on June 18 – July 9. He will visit Guatemala City, El Paredon, Antigua, and possibly Panajachel. Due to the locations and antenna restrictions, he will operate mainly on FT8 and FT4, with some SSB. Using an Icom IC-7300 or IC-7100 with 10 W or more, as well as a wire antenna or a JPC-12, Todd will be active on 40 – 10 meters and maybe 80 meters. Contacts will be uploaded to LoTW and QRZ.

ZC4 — UK Sovereign Bases on Cyprus

Adrian, GØKOM, was disappointed that he couldn't visit the UK Sovereign Bases on Cyprus in March, but he plans to go in July and/or October – November. He wanted to buy a BuddiHEX hexbeam for the operation, but high shipping costs and 20% value-added tax made him reconsider. Adrian has the ZC4MK call sign, and he mentioned that 10 meters has been excellent recently. He's hoping for a good sporadic-E season on 6 meters. At home, Adrian uses an IC-7600 and IC-7000, but he hasn't decided which one to take to Cyprus.

ZD8 — Ascension Island

Larry, KI6LT, will be working on Ascension Island on July 14 – 22, and he plans to be active as KI6LT/ZD8 in his spare time. For those who are participating in the CQ DX Marathon, this will be the second ZD8 activity in 2025. He plans to take a Yaesu FT-710 and an end-fed 40-meter wire with him. Larry will be active on SSB, with additional plans to use *WSPR* on 40, 20, 15, and 10 meters. He will most likely be on the air between July 18 and 21.

Top 25 DXCC Most Wanted

The top 25 DXCC entities are rare for a reason, and it creates a lot of buzz when they're activated. In January 2025, the SV1GA/A operation from Mount Athos surprised us. At that time, SV/A was number 27 on Club Log's DX Century Club (DXCC) Most Wanted List. In late April, DXers were surprised again by the ZS8W DXpedition to Marion Island (ranked number 11), conducted by Yuris, YL26M. These examples show that you never know what can suddenly go on the air. However, it's important to note that accusations quickly followed these operations. Remember DXCC Rule 14: Conduct (**www.arrl.org/dxcc-rules**). Violations could lead to DXCC disqualification.

Other top 25 DXpedition announcements include 3YØL on Peter I Island (seventh most wanted) scheduled for early 2027, 3YØK on Bouvet Island (10th most wanted) planned for February 2026, and PYØ/S on the St. Peter and St. Paul Rocks (14th most wanted) in October/November 2025. More top 25 DXpeditions are being worked on for the future.

Wrap-Up

That's it for this month, with thanks to AF4CZ, GØKOM, KE3Q, KI6LT, KV1J, OK2WX, W4DTA, and *The Daily DX* for helping to make this month's column possible. Don't forget to send your DX news, photos, and club newsletters to **bernie@dailydx.com**. Until next month, see you in the pileups! — *Bernie, W3UR*

Jon Jones, NØJK, n0jk@arrl.org

The World Above 50 MHz

Antarctica, Various DXpeditions, and Remote Stations on 6 Meters

At around 1300 UTC on April 13, 2025, DPØGVN (IB59) in Antarctica worked stations in southern Europe and the Middle East. The station was using 6-meter *MSHV* on FT8 and was spotted by F4JBF (JN33) and EA3LX (JN11). I reviewed DX Summit spots, and I saw that DPØGVN was into Europe on April 1, 2, 3, 6, and 8. These may have been the first terrestrial 6-meter European contacts made from Antarctica since Solar Cycle 23. Ukrainian Antarctic station EM1U worked CT1EEB on April 17, 2003, on SSB. During that contact, EM1U had a five-by-five report while running 100 W with an Icom IC-706 and a dipole. On April 5, 2025, W1EL and K1TOL spotted DPØGVN. DPØGVN is at the German Antarctic Research Station Neumayer III in Queen Maud Land.

C5R, HD8G, and VP2VI DXpeditions on 6 Meters

Three major DXpeditions were active on 6 meters in April. VP2VI deployed a four-element Yagi, and they reported making 411 6-meter contacts — 15 on CW, and the rest on FT8 across 26 countries. Among those contacts, they worked 215 in South America, 87 in Europe, 71 in North America, 22 in Oceania, and 12 in Africa. Most of the North American contacts were made via F2 back/side scatter. HD8G (EI49) used a five-element Yagi on 6 meters, and Online QSL Request Services lists 34 contacts with them on 6 meters. Rick, HC1MD/2, worked HD8G on FT8. HD8G completed 37 Earth-moon-Earth contacts on 1296 MHz. On April 26, C5R (IK13) had a strong opening to Europe at around 1830 UTC, working many on 50.095 MHz CW. LZ2CC reported that C5R was +26 dB on FT8.

PY2XB Remote 6-Meter Stations

Fred Carvalho, PY2XB, said:

> I was quite busy operating two remote stations last year: PY2XB, the one I usually use, and PR7XB, [which] we have assembled in HI22jr in September 2023. I worked into the W and VE [call sign regions] with both stations. There were also lots of stations from PY2, and some US [stations] from PR7. The stations are around 2,300 kilometers apart. From PR7XB, [on] the first operating day, I worked two new ones: V51WW and XX9ET. I also worked 7Q7EMH. Junior, PR7AB, [one of the HD8G operators,] and I share this remote station.

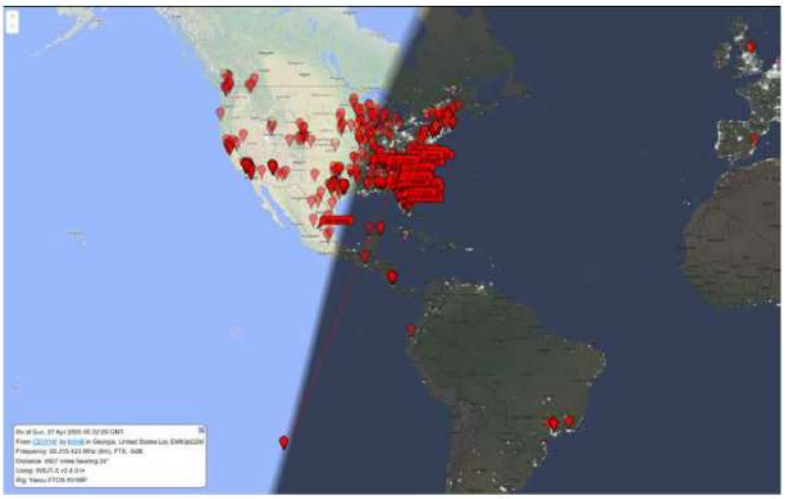
The PY2XB remote station consists of an eight-element loop-fed array (LFA) with a 12.5-meter boom and 600 W. The remote PR7XB station has a seven-element LFA with a 9-meter boom, and it uses an amplifier.

On the Bands

50 MHz. On April 1, Mike, VP8NO (GD18), was in to Europe, and the next day, he noted a strong chordal-hop F2 opening to North America. He worked AF5CC (EM04; he used a two-element quad), KCØY (EM17; he used a Moxon), and me, NØJK (EM28; I used an attic dipole), at 1750 UTC. VP8NO runs 700 W to a five-element Yagi elevated 60 feet.

On April 5, Al, K2BLA (EL99), worked ZL7DX at 1927 UTC, receiving a –12 dB signal report. Andre, N4WBE (EM70), worked CX1DDO and LU8DNY on SSB with a

Fred Carvalho, PY2XB (left), and Alcides "Junior" Fernandes, PR7AB (right), at the PY2XB remote 6-meter station. PR7AB also was part of the HD8G DXpedition. [Fred Carvalho, PY2XB, photo]



Jorge Jana's, CEØYHF, PSK flags on April 27, when he was in to the southeastern US on 6-meter FT8. [**www.pskreporter.info/pskmap**]

dipole and 70 W. In Kansas, I had HC1MD/2 in on F2 at 1955 UTC. Later, at around 2100 UTC, I noted sporadic E to the Gulf Coast, with an E_s link to transequatorial propagation (TEP) to Argentina. I logged LU9AEA and LW2DAF (GF05) on FT8. AD1C (DM79) saw PY3WW call me at 2238 UTC. Many stations worked N5YPJ in rare grid DL99, including me, NØLL (EM09), and KCØY and KFØM (both EM17) at 2320 UTC. VP8LP (GD18) worked southern Europe via SSB on April 6, and he worked others in region W4 on April 8, including W4HLR (EM55) at 1700 UTC.

On April 9, at around 2330 UTC, Bob Keating, N6REK (DM04), worked ZL1AKW (RF82) and ZL2WHO (RE79) via FT8. On April 16, a brief category 4 (severe) geomagnetic storm took place, causing the K index to peak at 7. Steve Sacco, NN4X (EL98), and Ken Reecy, AC4TO (EM70), received PSK flags from YC9HJD (OI81) at 1701 UTC via long path. NN4X worked CT1EEX and EA8TL. Steve said K1TO (EL87) saw 9K2GR and 4X4DK on FT8. F2 was reported from the northeast US states and Canada to northern South America. 8R1TM (GJ06) was active from Guyana.

The Lyrid meteor shower peaked on April 22. Larry Lambert, NØLL, traveled to Neligh, Nebraska, to activate EN02. Larry made 24 contacts; he made 22 via MSK144, and his best DX was with KB8VAO (EN91) from 1,491 kilometers away, and with WA4CQG (EM72) from 1,657 kilometers away. He copied CE2SV and CE3SX on FT8 at around 1940 UTC that afternoon, but he said he was "unable to get their attention." KCØY and I, NØJK, logged NDØB (EN07) on MSK144. Barry, K7BWH, and Ed, N7PHY, operated from DN07 during the Lyrids. Their trip was meant to help them practice setting up their portable stations before going to DL88 on May 25.

On April 25, Mike Downing, KCØY, worked 4A100IARU (DK09) via E_s and XR100IARU (FF46) via an E_s link to TEP. On April 28 and on MSK144, Mike logged 4A1RBM (DL86) during a Parks on the Air® activation. Juan, TG9AJR (EK44), also worked 4A1RBM on FT8. He said that 4A1RBM was located in "La Zona del Silencio" in Mexico.

On April 27, Jorge Jana, CEØYHF, on Easter Island, made a rare appearance and worked stations in regions W4 and W5, likely via an E_s link at around 0030 UTC. The next day, California stations, including K6QXY, worked VK9DX, E51WL, VK4MA, and FK8CP.

On April 30, the TX9A DXpedition team worked those in call sign regions W1, W2, and W3 at around 2300 UTC. NK1K (FN42), NZ3M, NX7U (FN20), and *QST* "How's DX?" columnist Bernie, W3UR (FM19), worked TX9A on 6-meter FT8. Ken, AC4TO (EM70), worked TX9A, too, at 1902 UTC. Ken was the first US station that TX9A worked on 6 meters. These contacts may have been the result of an Es link, as NZ3M noted a "cross path" (suggesting an Es cloud) over the EM88 area.

144 MHz. On April 20, at around 1130 UTC, N8ECI (EM79) received Eloy Ritter, W4ERP (EL95), on FT8 via tropospheric propagation; he was 1,558 kilometers away. Eloy uses just 10 W and a four-element Yagi on his balcony. He worked stations in Virginia, as well as North and South Carolina.

Here and There

With the high solar flux and seasonal sporadic E, watch for E_s linking to TEP in July. Last year, PY2XB and E51EME made many North American 6-meter contacts in July. Solar scientist Dr. Scott McIntosh gave a presentation about the start of Solar Cycle 26, which you can watch at **https://youtu.be/5pHbGILprjg**.

Wayne Overbeck, N6NB (SK), passed away on April 12, 2025. Wayne had many accomplishments, but I believe the most important to VHF/UHF enthusiasts was his inventing the Quagi antenna. The Quagi is a Yagi with a two-loop quad feed at the end. It is simple to make, and if care is taken in construction, it works. A 2-meter, eight-element Quagi can be made for less than $15. The gain (12 dBd) is the same as a commercial antenna that may sell for $400. Read more information about the Quagi at **www.overbeck.com/quagi.htm**.

Field Organization Reports — April 2025

Public Service Honor Roll

This listing recognizes radio amateurs whose public service performance during the month indicated 70 or more points in six categories. Details on the program can be found at: **www.arrl.org/public-service-honor-roll**.

515
AD8CM

425
N9VC

400
AC8NP

315
W7EES

311
KE8BYC

305
KE8ANW

290
WM5N

277
KD2LPM

264
WØPZD

257
KB5PGY

245
W7PAT

232
K5OB

224
KT5SR

207
W9RY

195
WB8YYS

194
W1RVY

190
KT2D

185
ND8W

180
W9EEU
N2LC

176
KD2NMG

175
K3JL

170
W5WMC
K7OED

169
KC8YVF

165
W4DNA

164
ACØKQ

160
AG9G
KE4RS
KV2J

158
W5RFY

155
KF5OMH

150
KR4PI
W9BGJ
WD8USA

143
KDØHHN

142
KC8PBU

140
WO2H

137
KA9IKK
WM2C

135
KC9FXE
N8SY
KE5YTA

134
W2OOD

133
KN4QJ
KE8HKA

130
WA3QLW
KY2D
N2JBA

KD8ZCM
WK4WC
KW1U
N1UMJ
N1ILZ

128
K8MDA

126
W1LEM

125
W2PAX
K9LGU

123
WZØC

122
KM4WXX

120
WA4VGZ
W4CMH
KC4FSU
KD8UUB
W2AH

119
WB9QPM

118
W3YVQ
N1HAN

117
KE8DON

116
N2DW

115
WB9WKO
AI9F
KO4OL
KB3YRU

114
K1YBO

110
KM4WHO
WV5Q
AE5MI
KC8WH
K2VTT
N4CNX
N1IQI
KC1KVY

108
W8IM

106
W8ROY

105
KL7RF
NØET
WX2DX

102
KO4KUS

101
K9SX

100
N3STP
NX9K
AD4DO
KZ8Q

WB8RJW
KB8GUN
N8MRS
WD8SDH
KA5AZK
W1KX
K2MTG
K3YAK
KA2HZP
KB2QO
KD2PQP
K8ED
W4EDN
N1LAH
W1TCD
KC1HHO

99
K5ANP
WB2VUF
WW3S

98
WB8SIQ

97
WØAHA

96
N4NOA
KB2YAA

95
WB9EDL

94
AD3J

93
K1CJV
AA3EZN

91
W4TTO

90
KB9GO
KC9UC
AB9ZA
N8OD
K3RC
W8GSR
K8KRA
WA3QPX
K2MJR
W2QMI
KB8PGW
KN4AAG
W4KX
N1CVO

89
W2ARP

87
KT4WX
N5RH

86
KF6GC

85
NJ5R

84
N2TSO

83
K6RAU

81
KB4OLY
K6JT

80
KR4ST
AD4DO
AJ7B
W2ITT
KC3SJ
KBØDTI

79
WB9RGE

77
WB4ZDU
AA3N
K1STM

76
W5XX
K8RDN
KAØDBK

75
WB3FTQ

74
W2ZXN

72
WDØBFO

71
AF9SC
K2PHD

70
W3STN

The following stations qualified for PSHR in previous months, but have not been recognized in this column yet: (March) KK4PUX 255, NA7G 120, N7IE 118, W4CAC 112, N7UWX, N3SW 90; (February) KK4PUX 230, W4CAC 108, N3SW 79; (January) KK4PUX 270, W4CAC 113, N3SW 90.

Section Traffic Manager Reports

The following Section Traffic Managers reported: AR, AZ, CO, CT, DE, EMA, ENY, GA, IA, IL, IN, KS, KY, LA, MDC, ME, MI, MO, MS, NC, NE, NFL, NLI, NM, NNJ, NNY, NTX, OH, OR, RI, SNJ, STX, TN, WCF, WI, WMA, WNY, WPA, WWA, WY.

Section Emergency Coordinator Reports

The following Sections submitted ARES Activity Reports: AR, CT, EMA, ENY, EPA, GA, IL, IN, MO, NFL, NLI, NNJ, NNY, NTX, NV, OH, PR, SNJ, STX, TN, VA, WCF, WMA, WPA, WTX, WY.

Brass Pounders League

The BPL is open to all amateurs in the US, Canada, and US possessions who report to their SMs a total of 500 or more points or a sum of 100 or more origination and delivery points for any calendar month. Messages must be handled on amateur radio frequencies within 48 hours of receipt in standard ARRL radiogram format. Call signs of qualifiers and their monthly BPL total points follow.

W2AH 2,065, KY2D 2,063, NX9K 1,389, WB9WKO 681, KW1U 670, KE5YTA 575, N9CK 558, KB9GO 522, KC1KVY 509.

Congratulations

April 2025
QST Cover Plaque Award Winner

Jay Kolinsky NE2Q

In his article, "Turn Your Vertical Antenna into a Rotatable Beam," Jay explains how he turned a single-element beam into a narrow beamwidth directive aerial with the use of carbon fiber. He calls this new antenna the LLS (Loof Lirpa Slot).

QST Cover Plaque Awards are given to the author or authors of the most popular article in each issue. *You* choose the winners by casting your vote online at

www.arrl.org/cover-plaque-poll

Log in now and choose your favorite article in this issue!

Turn Your Vertical Antenna into a Rotatable Beam

Laser-like 3-degree beamwidth thanks to a carbon fiber slotted sleeve.

Jay Kolinsky, NE2Q

Many hams who use vertical antennas are dissatisfied with their performance, compared to their buddies who use directional beam-type antennas that concentrate their RF emissions over a narrow area of 50 to 80 degrees. There is no doubt that the azimuth antenna pattern for vertical radiators is basically a perfect circle. Your transmitted RF is spreading equally over a 360-degree circle. This is a significant waste of energy because you talk to only a station in a pinpointed area. Using a vertical antenna for receiving demonstrates that signals are received from all directions, just like interference, man-made, and atmospheric noise. Most of us have heard two common phrases: "Verticals radiate poorly in all directions" and "Verticals are very noisy antennas."

My First Antenna

I read the full-page advertisements by Gotham that used to appear in *QST*. The ads featured the V-80 vertical. I ordered one, and it came in a long, skinny carton. It consisted of two aluminum tubes, one smaller than the other to telescope into the larger tube. It was held together at the joint with a hose clamp and was about 21 feet long when fully assembled. There was also an air-wound coil about 3 inches in diameter. The idea was to put an alligator clip on the center of the coax feed line and tap the coil at different points for operations on 10 through 80 meters. I installed the antenna on the side of my father's summer home in Mohegan Lake, New York, and it worked. I made contacts but heard very few signals outside of the US. I used it until 1962, when I built a two-element 20-meter quad antenna using bamboo arms with a fiberglass tape coating. The quad outperformed my V-80 on 20 meters.

I've always been a creative thinker and developed new products over the years. Some of my early inventions are in the Smithsonian Institution in Washington, DC, and I even have a few US patents. One day, I was thinking about the shortcomings of verticals. I wondered, "How about turning a single vertical element into a narrow beamwidth directive aerial?"

Figure 1 — The carbon fiber tube placed over Jay Kolinsky's, NE2Q, magnetic mount antenna on his car.

Carbon Fiber to the Rescue

I heard someone mention that carbon fiber tubing will distort RF antenna patterns, which made me realize that a sleeve of carbon fiber slipped over a vertical element might severely restrict RF from escaping from a vertical. I quickly obtained a 10-foot tube of carbon fiber 2 inches in diameter and decided to experiment. I installed my ¼-wave, 2-meter magnet-mount vertical antenna on the center of the roof of my car, and took readings with my field strength meter 50 feet away. I ran 25 W and recorded the 20% field strength needle

Convention and Hamfest Calendar

A = AUCTION
D = DEALERS / VENDORS
F = FLEA MARKET
H = HANDICAP ACCESS
Q = FIELD CHECKING OF QSL CARDS
R = REFRESHMENTS
S = SEMINARS / PRESENTATIONS
T = TAILGATING
V = VE SESSIONS

Abbreviations

Spr = Sponsor
Tl = Talk-in frequency
Adm = Admission

Alaska (Kenai) — July 19 F H T
10 AM – 4 PM. *Spr:* MooseHorn ARC. Kenai American Legion Hall, 902 Cook Dr. *Tl:* 147.03 (100 Hz). *Adm:* $5. **www.al7le.org**

Colorado (Grand Junction) — Aug. 9 D F H Q R S T V
8 AM – 3 PM. *Spr:* Western Colorado ARC. First Christian Church, 1326 N. 1st St. *Tl:* 146.940 (107.2 Hz). *Adm:* $5. **www.w0rrz.org**

Florida (Milton) — July 18 – 19 D F H R T V
Fri. 3 PM – 8 PM, Sat. 8 AM – 1 PM. *Spr:* Milton ARC. Santa Rosa Co. Auditorium, 4530 Spikes Way. *Tl:* 145.490 (100 Hz). *Adm:* $10. **www.miltonarc.org**

ARRL IDAHO STATE CONVENTION

August 9, Post Falls, Idaho
D F H S T V
8 AM – noon. *Spr:* Kootenai ARS. River of Life Friends Church, 3263 E. 12th Ave. *Tl:* 146.98. *Adm:* $5. **www.k7id.org**

Illinois (Carlinville) — Aug. 2 D F H Q R S T V
7 AM – noon. *Spr:* Macoupin Co., Montgomery Co., Okaw Valley ARCs, Sangamon Valley Radio Club. Macoupin Co. Fairgrounds, 21368 State Rte. 4. *Tl:* 444.250 (103.5 Hz). *Adm:* $10. **www.wcilhamfest.com**

Illinois (Peotone) — July 20 D F H Q R S T V
6 AM – 1 PM. *Spr:* Kankakee Area Radio Society. Will Co. Fairgrounds, 710 West St. *Tl:* 146.94 (107.2 Hz). *Adm:* $8 Advance, $10 door. **www.w9az.com/karsfest.html**

Illinois (Peotone) — Aug. 3 D F H R S T V
6 AM – 1 PM. *Spr:* Hamfesters Ham Radio Club. Will Co. Fairgrounds, 710 West St. *Tl:* 146.52. *Adm:* $8 Advance, $10 door. **www.hamfesters.org**

Indiana (Auburn) — July 19 D F R T V
9 AM – 2 PM. *Spr:* Northeastern Indiana ARA. Auburn Cord Duesenberg Museum, 1600 Wayne St. *Tl:* 147.015 (141.3 Hz). *Adm:* Free. **www.w9ou.org**

Indiana (Elkhart) — Aug. 2 D F H Q R V
9 AM – 2 PM. *Spr:* Northern Indiana K9DEW Repeater Network. Northern Indiana Event Center, 21565 Executive Pkwy. *Tl:* 147.33 (131.8 Hz). *Adm:* $8; 12 and under, free. **www.elkharteasthamfest.com**

Indiana (Portland) — July 26 D H R V
8 AM – 2 PM. *Spr:* Jay Co., Whitewater Valley ARCs. Jay Co. Fairgrounds, 806 E. Votaw St. *Tl:* 443.475 (100.0 Hz), 145.210 (97.4 Hz). *Adm:* Free.
www.sites.google.com/view/ecindianahamfest/home

Iowa (Central City) — Aug. 2 D F H R S T V
8 AM – 5 PM. *Spr:* Cedar Valley ARC. Linn Co. Fairgrounds, 201 Central City Rd. *Tl:* 146.745 (192.8 Hz). *Adm:* $10. **www.w0gq.org/cvarc-hamfest**

Kansas (Hutchinson) — Aug. 9 D F H V
8 AM – noon. *Spr:* Reno Co. Kansas ARA. HCC Fire Science Building, 3211 E. 4th Ave. *Tl:* 147.12 (103.5 Hz). *Adm:* $5. **www.rckara.org**

Louisiana (Shreveport) — Aug. 9 D F H R V
7 AM – 2 PM. *Spr:* Shreveport ARA. Louisiana State Fair Ag. Bldg., 3206 Pershing Blvd. *Tl:* 146.82. *Adm:* $10. Email: **b0bn5zvw@gmail.com**

ARRL MAINE STATE CONVENTION

August 2, Augusta, Maine
D F H Q R S V
8 AM – noon. *Spr:* Androscoggin ARC. Augusta Civic Center, 76 Community Dr. *Tl:* 147.255 (114.8 Hz). *Adm:* $10. **www.w1npp.org/convention**

Michigan (Berrien Center) — July 26 F R T
9 AM – 1 PM. *Spr:* Blossomland ARA, Midwest Classic Radio Net. Five Pines Ministries, 6597 Smith Rd. *Tl:* 146.82 (88.5 Hz). *Adm:* Free. **www.w8mai.org/index.php/club-information/bara-trunk-swap**

Missouri (O'Fallon) — Aug. 10 D F H R S T V
8 AM – noon. *Spr:* St. Charles ARC. O'Fallon Elks Lodge, 1163 Tom Ginnever Ave. *Tl:* 146.67. *Adm:* $10. **www.wb0hsi.org**

Missouri (Warrensburg) — July 19 D F H R S T
8 AM – noon. *Spr:* Warrensburg Area ARC. Johnson Co. Fairgrounds, 386 NW 145 Rd. *Tl:* 146.88 (107.2 Hz). *Adm:* Free. **www.waarci.org**

Missouri (Washington) — July 20 D F H R T V
7 AM – noon. *Spr:* Zero Beaters ARC. Washington Knights of Columbus Hall, 1121 Columbus Ln. *Tl:* 147.24. *Adm:* $7. **www.zerobeaters.org**

Montana (Snowslip) — July 18 – 20 D F H R S T V
8 AM – 10 PM. *Spr:* Great Falls Area ARC. Glacier Meadows RV Park, 15735 US-2. *Tl:* 146.52. *Adm:* $26 Advance, $30 door. **www.gwhamfest.org**

Nebraska (North Bend) — July 12 D F H Q R V
8 AM – 12:30 PM. *Spr:* Pioneer ARC. North Bend City Auditorium, 741 N. Main St. *Tl:* 443.90 or 146.67 (100 Hz). *Adm:* $5. **www.k0sw.org**

ARRL HUDSON DIVISION CONVENTION

July 13, Augusta, New Jersey
D F H Q R S T V
8 AM – 4 PM. *Spr:* Sussex Co. ARC. Sussex Co. Fairgrounds, 37 Plains Rd. *Tl:* 147.30 (151.4 Hz). *Adm:* $8. **www.scarcnj.org**

New Mexico (Socorro) — July 12 D F H Q R S T V
8 AM – 1:30 PM. *Spr:* Socorro ARA, New Mexico Tech ARA. Socorro Convention Center, 1220 US-60. *Tl:* 146.68 (100 Hz). *Adm:* $5. **www.socorroara.org**

New York (Alexander) — July 19 D F H R T V
6 AM. *Spr:* Lancaster ARC. Alexander Fire Department Grounds, 10708 Alexander Rd. Rte. 98. *Tl:* 147.28 (141.3 Hz). *Adm:* $10. **www.w2so.org**

New York (Camillus) — July 12 F H R T V
7:30 AM – 12:30 PM. *Spr:* Radio Amateurs of Greater Syracuse. Camillus Elks Lodge, 6117 Newport Rd. *Tl:* 146.91 (103.5 Hz). *Adm:* $5. **www.ragsclub.org**

New York (Clark Mills) — July 26 D F H R T V
8 AM. *Spr:* Utica ARC. Clark Mills Firehouse Grounds, 7705 County Rd. 19. *Tl:* 146.76 (103.5 Hz). *Adm:* $5. **www.uticaarc.org**

New York (Speculator) — Aug. 9 F H R T V
8 AM – noon. *Spr:* Northern New York-area clubs. Speculator Pavilion and Ballfield, 2834 NY-30. *Tl:* 147.165. *Adm:* Free. **www.adkhamfest.org**

New York (Trumansburg) — Aug. 2 F H R T V
7 AM – noon. *Spr:* Tompkins Co. ARA. Tompkins Co. Fairgrounds, 2150 Trumansburg Rd. *Tl:* 146.94 (103.5 Hz). *Adm:* $7. **www.tcara-ny.org**

North Carolina (Cary) — July 19 F H R V
8 AM – 1 PM. *Spr:* Cary ARC. Town of Cary Ritter Park, 301 W. Lochmere Dr. *Tl:* 146.88 (82.5 Hz). *Adm:* $5. **www.caryarc.org**

North Carolina (Fayetteville) — Aug. 9 F H R T V
8 AM – 1 PM. *Spr:* Cape Fear ARS. Cumberland Co. Shrine Club, 7040 Ramsey St. *Tl:* 146.91 (100 Hz). *Adm:* Free. **www.cfarsnc.org**

North Carolina (Salisbury) — July 12 D F V
7 AM – 1 PM. *Spr:* Rowan ARS. Salisbury Civic Center, 315 S. Martin Luther King Jr. Ave. *Adm:* $10. Email: **rmowery42@charter.net**

North Carolina (Waynesville) — July 26 D F H R S T V
8 AM. *Spr:* Western Carolina ARS. Smokey Mountain Event Center, 758 Crabtree Rd. *Tl:* 147.39 (94.8 Hz). *Adm:* $7 Advance, $10 door. **www.wcars-club.org**

ARRL NORTH DAKOTA SECTION CONVENTION

July 12, Minot, North Dakota
D F H Q R S V
8 AM – 2 PM. *Spr:* Souris Valley ARC. Minot City Auditorium, 420 3rd Ave. SW. *Tl:* 146.97 (77 Hz). *Adm:* $15, includes lunch. **www.k0ajw.com**

Ohio (Elyria) — July 19 D F H R
9 AM – noon. *Spr:* Northern Ohio ARS. Lorain Community College Spitzer Conference Center, 1005 N. Abbe Rd. *Tl:* 146.700 (110.9 Hz). *Adm:* $10. **www.noars.net/hamfests/noarsfest**

Ohio (Grove City) — Aug. 2 D F H Q R S T V
8 AM – 1 PM. *Spr:* Aladdin Shrine Audio Unit. Aladdin Shrine Center, 1801 Gateway Cir. *Tl:* 146.76 (123.0 Hz). *Adm:* $5. **www.columbushamfest.com**

Ohio (Montpelier) — July 19 F H R T
10 AM – 1 PM. *Spr:* Williams Co. ARA. Williams Co. Fairgrounds, 619 E. Main St. *Tl:* 146.82 (107.2 Hz). *Adm:* $7. Email: **ke8zhs@gmail.com**

Ohio (Van Wert) — July 20 F T
8 AM – noon. *Spr:* Van Wert ARC. Van Wert Co. Fairground, 1055 S. Washington St. *Tl:* 146.85. *Adm:* $5. **www.w8fy.org**

Oklahoma (Oklahoma City) — July 25 – 26 D F H Q R S V
Fri. 3 PM – 6:30 PM, Sat. 8 AM – 3 PM. *Spr:* Central Oklahoma Radio Amateurs. Oklahoma City Community College, 7777 S. May Ave. *Tl:* 146.76 (141.3 Hz). *Adm:* $10 Advance, $12 door. **www.hamholiday.com**

Pennsylvania (Erie) — July 12 F H R T V
7:30 AM – noon. *Spr:* Wattsburg Wireless Association. Greene Township Municipal Building, 9333 Tate Rd. *Tl:* 147.315 (186.2 Hz). *Adm:* Free. **www.wattsburgwireless.org**

Pennsylvania (Uniontown) — Aug. 9 D F H Q R S T V
7 AM – 2 PM. *Spr:* Uniontown ARC, 433 Pittsburgh St. *Tl:* 147.045 (131.8 Hz). *Adm:* Free. **www.w3pie.org**

Rhode Island (East Greenwich) — July 12 D F H R T
9 AM – 3 PM. *Spr:* New England Wireless & Steam Museum. 1300 Frenchtown Rd. *Adm:* Free. **www.newsm.org**

South Carolina (Florence) — Aug. 9 F
8 AM. *Spr:* Florence ARC. West Florence Fire Company Annex, 3379 Pine Needles Rd. *Tl:* 146.85 (123.0 Hz). *Adm:* Free. **www.w4ulh.net**

South Dakota (Sioux Falls) — July 19 F H R S T
8 AM – noon. *Spr:* Sioux Empire ARC. Westminster Presbyterian Church, 3801 E. 26th St. *Tl:* 146.895 (146.2 Hz). *Adm:* Free. **www.w0zwy.org**

Tennessee (Athens) — July 19 D F H Q R T V
7 AM – 2 PM. *Spr:* McMinn Co. ARC. McMinn Co. Expo Center, 2405 Decatur Pike. *Tl:* 146.82 (141.3 Hz). *Adm:* $5. **www.mcminnarc.com**

Tennessee (Lebanon) — July 19 D F H R S T V
8 AM – 3 PM. *Spr:* Wilson Co. ARC. James Ward Ag. Center Made in Tennessee Bldg., 945 E. Baddour Pkwy. *Tl:* 147.105 (156.7 Hz). *Adm:* $5. **www.midtnhamquest.com**

Texas (Texas City) — July 12 D F H Q R S V
8 AM – 2 PM. *Spr:* Tidelands ARS. Charles T. Doyle Convention Center, 2010 5th Ave. N. *Tl:* 147.14 (167.9 Hz). *Adm:* $10. **www.tidelands.org**

Vermont (St. Albans) — Aug. 9 F H T V
7 AM – noon. *Spr:* St. Albans ARC. Veterans of Foreign Wars Post 758, 353 Lake St. *Tl:* 145.23 (100 Hz). *Adm:* $5. **www.starc.org**

ARRL ROANOKE DIVISION CONVENTION

August 3, Berryville, Virginia
D F H Q R S T V
6 AM – 2 PM. *Spr:* Shenandoah Valley ARC. Clarke Co. Fairgrounds, 890 W. Main St. *Tl:* 146.82 (146.2 Hz). *Adm:* $10. **www.berryvillehamfest.com**

Virginia (Portsmouth) — Aug. 9 D F H T
9 AM – 3 PM. *Spr:* Tidewater Radio Conventions. Ambassador Club of Portsmouth, 364 Peninsula Ave. *Tl:* 146.85 (100.0 Hz). *Adm:* $10. **www.trcihamfest.com**

Washington (Centralia) — July 26 F R T
9 AM – noon. *Spr:* Chehalis Valley ARS. Lewis Co. Fairgrounds, 1909 S. Gold St. *Tl:* 146.06 (110.9 Hz), 145.52. *Adm:* $5. **www.qrz.com/db/K7PG**

West Virginia (Huntington) — Aug. 9 D H R T V
8:30 AM – 1:30 PM. *Spr:* Tri-State ARA. New Baptist Church, 610 28th St. *Tl:* 146.76. *Adm:* $6. **www.qsl.net/w8va**

ARRL WEST VIRGINIA STATE CONVENTION

July 26, Sutton, West Virginia
D F H R S T V
8 AM – 7 PM. *Spr:* West Virginia State Amateur Radio Council. Flatwoods Days Inn and Suites and Flatwoods Conference Center, 350 Days Dr. *Tl:* 145.29 (91.5 Hz). *Adm:* $10. Email: **wv8kdc@comcast.net**

Wisconsin (Racine) — Aug. 9 F R
6 AM – 1 PM. *Spr:* Racine Megacycle Club. Greater Racine Kennel Club, 6320 6 Mile Rd. *Tl:* 147.27 (127.3 Hz). *Adm:* Free. **www.w9udu.org**

To All Event Sponsors

Before making a final decision on a date for your event, you are encouraged to check the Hamfest and Convention Database (**www.arrl.org/hamfests-and-conventions-calendar**) for events that may already be scheduled in your area on that date. You are also encouraged to register your event with HQ as far in advance as your planning permits. See **www.arrl.org/hamfest-convention-application** for an online registration form. Dates may be recorded up to 2 years in advance.

Scott Freeberg, WA9WFA, wa9wfa@gmail.com

Classic Radio

Ted Crosby's, W6TC, *QST* Ham Band Receiver Series

From 1957 through 1965, Ted Crosby, W6TC (SK), wrote a series of articles in *QST* about ham radio receivers that could be "built by the average ham with an average ability." During that era, hams would often homebrew their own transmitters and receivers, as parts were widely available and inexpensive, and a ham could save a lot of money by building a radio themselves.

Keeping It Simple

Ted's first article, "Ham-Band 14-Tube Double-Conversion Receiver," in the July 1957 issue, described a homebrew radio with 14 tubes — the HBR-14. It was stable and sensitive, had an S-meter, and could be built by the reader. (I presume "HBR" stood for "ham band receiver," although that has been debated over the years.)

Ted simplified the design of his radios by using standard parts commonly available at local radio parts shops and making mechanics straightforward enough to be cut and drilled at your workbench, all without compromising performance.

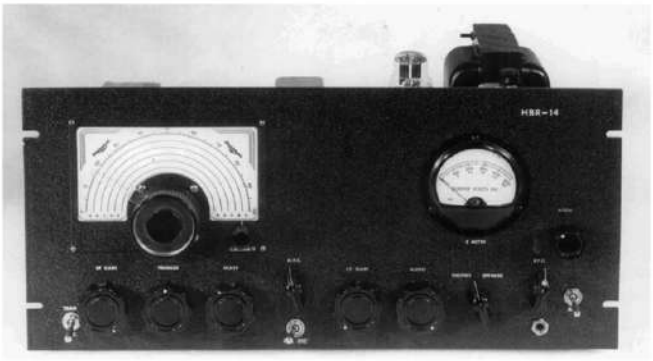
His receiver projects resonated with people because the designs were well thought out, hams were successfully building them, and he offered technical support. I've read that Ted would get dozens of letters per week from people seeking help or sharing information, and many "Technical Correspondence" letters providing information or help with fixing a problem were published in *QST* — it was an unexpected phenomenon!

The HBR Evolution

Over the years, improvements were made to the basic HBR design, and new models were published in *QST*: HBR-14 (July 1957), HBR-16 (October 1959), HBR-8 (March 1963), HBR-11 (April 1963), HBR-12 (April 1964), and HBR-13 (October 1965). Each model added new features, resolved issues with earlier models, and advanced the receiver's performance.

Ted followed up the HBR-16 with a model intended to be built by beginners, called the HBR-8. It was a good, high-quality radio that beginners could use on the air, and it provided an excellent way to learn how to build a radio. The HBR-11 and HBR-12 were Ted's last "simple" receivers.

The final receiver in the HBR series was the HBR-13C, published in Ted's October 1965 article, "HBR Developments." This radio build was a collaboration with Alex Stewart, WA4ZNI (SK). The main change on the HBR-13C was moving the Eddystone slide rule dial to the center of the front panel. All of the previous HBR models had the dial and sensitive electronics on the left side of the radio. In my opinion, while this HBR is top of the line in terms of performance, it is also the most electrically and mechanically complicated model, as there were significant mechanical changes made to



Ted Crosby's, W6TC, original HBR-14 receiver. [Photo provided by Lee Craner, WB6SSW]

Ted Crosby's, W6TC, original HBR-16 receiver. [Photo courtesy of **www.qsl.net/k5bcq/HBR/hbr.html**]

accommodate the centered dial. Ted was not in favor of this complexity, as he always strived to keep the HBR buildable by the average ham.

My Collection

I've personally owned two HBR-16s, an HBR-17, an HBR-11, and an HBR-13C, all built by others, so I can attest to their great performances. I think Ted Crosby would be surprised and pleased to know that hams still appreciate and build his receivers after all these years.

While the technology has moved on from tubes, there is still joy to be found in building tube radios from the 1960s. Some 55 years after the last HBR article appeared in *QST*, I decided to build one for myself and share in the phenomenon that Ted Crosby started in 1957 (see the sidebar "Building the HBR-13C, 55 Years Later").

A wealth of HBR receiver information can be found at **www.qsl.net/k5bcq/HBR/hbr.html** and **http://k4che.com/HBR/HBR%20page%201.htm**.

Building the HBR-13C, 55 Years Later

After following the HBR adventure in *QST* via the ARRL Periodicals Archive and Search (**www.arrl.org/arrl-periodicals-archive-search**), I decided to build an HBR-13C (in hindsight, as a beginner builder, I should've tackled the HBR-8 first). Because the necessary parts haven't been made in 30 – 40 years, I had to search for them from a variety of sources, including a junker HBR-11, eBay, and friends. This may have been the most difficult task — I casually hunted for a year or more. I received the rare and gorgeous Eddystone 898 slide rule dial as a gift from Larry Baker, WB5OFD, and the polar three gang variable capacitor (the heart of the HBR) as a gift from Paul Monroe, W9MEH.

I created mechanical drawings and templates of the front panel, main chassis, and sub chassis that document the location of every hole, tube socket, and opening. I placed my drawings over the metal chassis, then folded and taped them in place. I milled and drilled all the marked holes and openings in the chassis per the template, then installed the tube sockets and mechanical pieces.

While W6TC was an expert builder, I was not. I chose to use a larger chassis for easier parts placement, finding the extra building space to be invaluable, and positioned the Eddystone 898 dial on the left side of the front panel to reduce mechanical complexity. I installed the parts by following the schematic from left to right, starting with the RF input and ending at the audio output. After placing a part or making a wire connection, I marked it on the schematic to indicate that it was placed. I encountered several mechanical and electrical issues along the way but was able to resolve them. I chose not to implement the AM detector tube, so while this is the HBR-13, my version uses 12 tubes. I also chose to use a plexiglass front panel.

After turning the radio on, I discovered an alignment issue, but thankfully it was a quick fix, and I finally heard the sweet tone from the signal generator at the antenna connection coming from the speaker. I hooked up the HBR to an outside antenna and operated 40 meters. I was surprised to hear just how well it worked for a 1965-era homebrew radio. It copies CW and SSB on 80, 40, and 20 meters just fine. Because it's a tube radio, it takes about 30 minutes to fully warm up and stabilize, but once it's stabilized, it remains on frequency. The audio is deep, with more pleasant lows than the typical modern transceiver. I did a sensitivity comparison between the HBR and my modern transceiver, and the HBR appears to be just as sensitive, so it can hear the weak signals. The Eddystone 898 slide rule dial is a dream to use, as it's smooth to tune, and signals are spread out across the dial for fine-tuning. While the bandwidth is fine for SSB, I'll be adding some audio filtering to narrow the CW bandwidth. I plan on building a transmitter to go along with this receiver and put my own homebrew station on the air!

Thanks to W6TC's articles and updates in *QST*, and HBR technical information provided by Lee Craner, WB6SSW; Ed Kent, K8EML; Jay Helms, W6HHT; the "HBR Receiver Web Site" (**www.qsl.net/k5bcq/HBR/hbr.html**), and others, I didn't feel alone with this complicated project. I'd also like to thank Chuck Milton, W4MIL, for his technical help and encouragement.

You can hear what this receiver sounds like in operation on 80, 40, and 20 meters by visiting my YouTube channel, Scott's Amateur Radio Projects (**www.youtube.com/@scottsamateurradioprojects1981**).

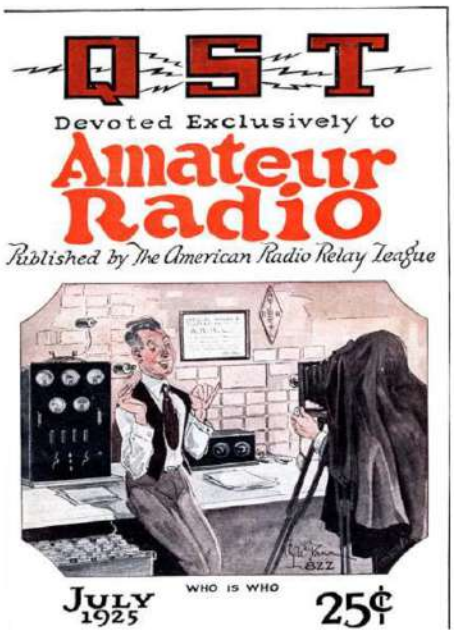
WA9WFA's HBR-13 front view.

WA9WFA's HBR-13 rear view.

100, 50, and 25 Years Ago

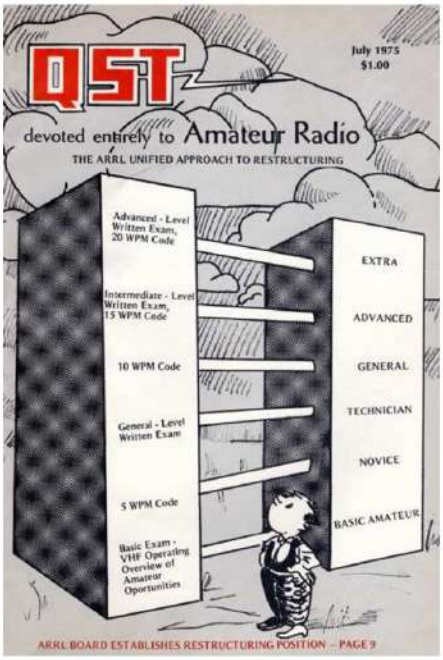
July 1925

- The cover shows a ham posing with his station for the cameraman with the caption "Who is Who."
- "Editorials: The International Era," by K. B. Warner, 1BHW, states that the international coordination of amateur radio is the duty of the International Amateur Radio Union, and explains how we all need to work together to have a strong and healthy Union, representative of us all.
- Motion pictures by radio are here! G. L. Bidwell explains the details behind the Jenkins prismatic disc and how it works in "Television Arrives."
- A daylight two-way communication record of 10,300 miles was made between England, 2OD, and Australia, 2CM. The details are in "England and Australia Work in Daylight!"
- By adding a radio, antenna, and other gadgetry, Oliver Wright, 6GD/6BKA, turns his roadster into a true radio flivver. All of the particulars can be found in "Loops and Fords."
- Characteristics of good operators and tips for becoming one are shared in "The Traffic Department: Operating Your Station" by A. W. McAuly, 8CEO.
- William Coats Borrett, c1DD, shares a "Report to Canadian Hams on I.A.R.U. Conference."



July 1975

- The cover image is a single ladder, synthesized from member comments on the FCC's proposed "dual ladder" approach to licensing.
- The ramifications of the FCC's restructuring proposal are detailed in "It Seems to Us…" by Richard L. Baldwin, W1RU.
- A frequency independent antenna for vertical polarization is described in "The HF Discone Antenna" by John S. Belrose, VE2CV/VE3DRC.
- Wes Hayward, W7ZOI, shares how accurate and meaningful measuring can be done with simple equipment, easily built and calibrated in the workshop. Details are in "Defining and Measuring Receiver Dynamic Range."
- "A Crystal-Controlled SSTV Sync System" that permits continuous SSTV synchronization without interruption due to on-the-air interference is described by Robert F. Tschannen, W9LUO.
- A solution to front-end overload problems is explained in "Monolithic Crystal Filter Application in Amateur VHF Repeaters" by Joseph M. Hood, K2YAH.
- Wendy Clay, WN7WEO, shares the story of her unique ham radio journey in "How I Got My Novice and Found True Love."



July 2000

- The club station SKØUX antenna farm near Stockholm, Sweden, is shown on the cover.
- David Sumner, K1ZZ, provides insight from the World Radiocommunication Conference, WRC-2000, concerning satellite and other radio spectrum in "It Seems to Us…Galileo."
- Simple, geometrically shaped etheric transducers that work no matter what the geologic characteristics beneath them may be are discussed in "Flags, Pennants and Other Ground-Independent Low-Band Receiving Antennas" by Earl W. Cunningham, K6SE.
- Thomas H. Schiller, N6BT, explains how your enjoyment of amateur radio is directly related to your antenna in "Everything Works."
- A junk-box project that lends a helping hand when working with surface-mount devices is presented in "Build a Simple SMD Workstation" by Rick Littlefield, K1BQT.
- A replicated radio from the 1941 edition of ARRL's *How to Become a Radio Amateur* is the topic of this month's "Old Radio" column, "Building A Fine Old Radio Today," by John Dilks, K2TQN.
- Rich Arland, K7SZ, constructs a portable multiband antenna in "QRP Power: The QRP Commando Stealth Dipole."

Silent Keys

It is with deep regret that we record the passing of these radio amateurs:

K1DEJ **Sakowski**, Joseph J., Dalton, MA
K1DL **Lang**, Richard H., Lebanon, NH
WB1EHS **Murnane**, Barbara A., Williamsburg, MA
N1HSJ **Lachant**, Alden M., Bennington, VT
AA1JR **Ranagan**, Joseph A., Sangerville, ME
N1KGN **Cellini**, Edmond L., Trumbull, CT
•W1REM **Manzi**, Richard Earl, Sr., North Andover, MA
W1SIL **Silvia**, Richard J., Sr., Navarre, FL
K1TQK **Stairs**, Robert W., Gorham, ME
vKA1V **Carpenter**, Ralph F., Florence, MA
K1WTA **Pauze**, Leonard H., Jr., Enfield, CT
K1ZUU **Heck**, Nancy, Sutton, MA
v♦W2AXL **Rathmell**, Jack E., Franklin, MA
KA2BCE **Toussaint**, Marion F., Tempe, AZ
vK2DEG **Saltzman**, Donald J., Cedar Grove, NJ
v•KD2DNZ **Cassidy**, Paul, Fanwood, NJ
♦AK2E **Post**, Harold S., Middle Grove, NY
vKW2F **Ludovico**, Louis A., Loudon, TN
N2GBT **Daley**, Joseph P., Ormond Beach, FL
v•KD2HTX **Ferguson**, Glen A., Jr., Westford, NY
vN2LDZ **Johnson**, E. C., Hoschton, GA
WB2OWO **Wierzbinski**, Dawn E., Cheektowaga, NY
KC2PFU **Caravella**, Herbert U., Cliffwood, NJ
W3BNN **Eans**, Claude S., II, Walkersville, MD
♦AF3K **Howell**, John S., Naples, FL
vWA3MUR **Ward**, Robert B., Murrells Inlet, SC
•AA3NL **Merrow**, Charles H., Punxsutawney, PA
v•N3QHS **Hershberger**, Robert, Arlington, VA
W3VEX **Quinn**, James J., Bridgeville, PA
KB3VNP **Haefner**, Robert John, Sr., Williamsport, PA
vKC3WLB **Baker**, Warren L., Du Bois, PA
vKA4AFI **Ketcham**, James C., Ozark, AL
KN4AME **Gooch**, Robert, Wilmington, NC
vKB4BDJ **Stokley**, John L., White Pine, TN
N4BET **Sullivan**, Michael J., Kingsport, TN
♦K4BR **Mac Donald**, John, Mooresville, NC
v•K4BUJ **Rode**, Donald W., Delaware, OH
KM4CL **Mathews**, Earl W., Ocala, FL
•WF4CSA **Frank**, Jeffrey L., Hillsborough, NC
•KN4DQ **Evans**, James L., Catonsville, MD
WL4DX **Notte**, Mathew M., Anchorage, AK
vKM4EMW **Edwards**, Alton C., Riegelwood, NC
v♦WA4GDB **Schmidt**, George W., Virginia Beach, VA
WW4HB **Blanton**, David W., Cherryville, NC
vK4ING **Capley**, Frankie C., Smyrna, TN
W4IOQ **Craver**, Theodore F., Hilton Head Island, SC
K4JAC **Cooley**, Peter M., Jr., Savannah, GA
vK4JUU **Chapman**, Dennis Steven, Hookerton, NC
WB4KRZ **Metcalf**, Ruth J., Asheville, NC
♦WB4KXS **Towers**, Loyd F., II, Richmond, VA
WX4L **Moorman**, Russell F., Cape Coral, FL
KF4MDX **Overman**, Marty L., Lexington, TN
K4MGA **Almond**, Larry J., Sr., Albemarle, NC
vKM4MKN **Cole**, Billy W., Monticello, KY
N4NOE **Noe**, Nancy S., Willis, MI
NA4PM **Moses**, Robert Paul, Jr., Irvington, AL
•K4PQD **Gimbert**, Thomas W., Norfolk, VA
W4RJ **Pounders**, Ted L., Florence, AL
•KD4VFY **Espravnik**, Howard, Gallatin, TN
vW4WNJ **Smith**, Wilburn H., Rock Spring, GA
WA4WWQ **Turner**, Gary L., Louisville, KY
vKB4XF **Cavanagh**, John F., Winchester, VA
♦N4XF **Moore**, Franklin D., Franklin, TN
N4ZED **Durand**, Kenneth R., Cumming, GA
NZ5A **Logan**, Robert S., Alvin, TX
KI5BZI **Fish**, Ellis E., Los Lunas, NM
vWA5CB **Nelson**, Scott, Wichita Falls, TX
AI5CD **Bellah**, Mark E., Alva, OK
vW5CMB **Barrow**, George E., Fort Walton Beach, FL
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vWB5ECJ **Kendrick**, Kenneth L., Oklahoma City, OK
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vK6IPO **Osowski**, Peter, Gardner, MA
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KM6OPS **Fincher**, David, Buena Park, CA
KN6PGK **Burch**, Shawn, Rancho Cucamonga, CA
vAD6PP **Graham**, Rorick L., Thousand Oaks, CA
WH6SZ **Whaley**, Brock, Kailua, HI
vK6UIU **Cutter**, Frederick, Livermore, CA
W6UKW **Cutting**, Jack L., Livermore, CA
N6VFU **Buhite**, Rick I., Grants, NM
vN6VQO **Manard**, Aldon R., Spring, TX
vN6WHK **Pedigo**, Phillip W., La Mesa, CA
•N7AVY **Butts**, Donald D., New Braunfels, TX
KC7BDP **Allen**, James M., Yuma, AZ
N7HWY **Scattergood**, Darrell M., II, Mercer Island, WA
•KC7IL **Goldman**, Stephen J., Arvada, CO
W7IUC **Leggett**, Gerald N., Big Pine Key, FL
♦W7MC **Ticknor**, Sergei, Phoenix, AZ
vKE7MRS **Scholl**, David M., Eagar, AZ
WA7NRP **Johnson**, Michael L., Burley, ID
vKF7PB **Ellis**, William H., Jr., Mercer Island, WA
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v♦K7RT **Spidell**, Norman E., Mountain Home, ID
K7WFV **Carroll**, Dennis M., Yakima, WA
AB7YZ **Jones**, Michael L., Farmington, UT
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vWB8BIE **Kilroy**, Robert E., Frisco, TX
WD8BXV **Ungemach**, Robert L., Roseville, OH
N8CFZ **Roberts**, John K., Benwood, WV
W8CIN **Gillum**, Denzil R., Moores Hill, IN
v♦N8CPF **Kalt**, Stephen, Fenton, MI
vWA8DFC **Bolenbaugh**, David Rex, Forest, OH
•KA8DRN **Mansfield**, Vivian F., Jr., Oak Hill, WV
♦W8FF **Karriger**, Maurice C., North Port, FL
KD8FUJ **Smith**, Dennis J., Waterford, MI
N8HLK **Musson**, Patricia, Traverse City, MI
v•KG8IG **Wright**, Charles J., Newton Falls, OH
♦•KA8JJN **Koch**, Allan C., Allendale, MI
vW8JKS **Smart**, John K., Chillicothe, OH
♦W8KEN **Kontor**, Ken, Chesterland, OH
WB8MWE **Billman**, James S., Willard, OH
K8NBZ **Kodysz**, James D., Brunswick, OH
•WB8NHV **Strieble**, Jeffrey H., Fairport Harbor, OH
v♦•KC8NN **Meeves**, Allan, Marquette, MI
vN8QFZ **Berter**, Neal J., Cincinnati, OH
vW8QMA **Fuhrer**, Jack, Strasburg, OH
•WB8RRR **Linn**, James R., Cincinnati, OH
KD8SON **Quillen**, Charles E., Coshocton, OH
v•KA8UTF **Coulter**, Arthur, Brookville, OH
K9BIK **Lasek**, Cheryl, Zion, IL
W9BXY **Schwenk**, Dean F., Champaign, IL
WD9CVV **Culler**, Thomas M., Avilla, IN
♦W9DAN **Altenberger**, Daniel P., Hillsboro, IL
WA9EKQ **Helt**, Mathias J., Kennan, WI
vWD9FLJ **Pennings**, Wayne C., Antigo, WI
K9FQV **Genske**, Walter P., Brookfield, WI
vK9JDF **Holm**, Bernard G., Fort Wayne, IN
vW9JET **Thomas**, Jack, Hammond, WI
K9JJD **Glessner**, Glenn W., Quincy, IL
WB9JYZ **Bellinger**, Ronald D., Homewood, IL
KD9JZD **Eggert**, John E., Mooresville, IN
vK9LK **Giudici**, David J., Granville, IL
W9MDB **Black**, Michael D., Quincy, IL
N9MRJ **Mayer**, Robert A., Montgomery, IL
vWA9NE **Cornick**, Wayne A., Rolla, MO
N9QDJ **Anderson**, Charles A., Rochelle, IL
vKC9RCX **Rogers**, Glade N., Defuniak Springs, FL
WI9TOM **Liebe**, Thomas R., West Allis, WI
vW9TV **Visintin**, Peter, Gillespie, IL
vWB9TWJ **Glascock**, James T., Cedar Grove, IN
vWB9VNB **Watt**, David W., Frankfort, IL
WA9WAQ **Loftus**, Dan, Bourbonnais, IL
•WAØAKG **Lorenzen**, Richard M., Lincoln, NE
KJØB **Ierino**, Paul V., Duluth, MN
v•WDØBOZ **Johnson**, Lyle D., Gretna, NE
♦NØBZA **Samons**, Larry L., Malden, MO
v♦WBØENX **Andera**, Edwin C., Stillwater, MN
KEØFC **Boyer**, Daryl E., Pequot Lakes, MN
♦WØFP **Phillips**, Larry S., Liberty, MO
WAØFQE **Biggerstaff**, Gene D., Saint Louis, MO
KØHI **Nagle**, Arthur R., Saint Louis, MO
WBØHJK **Janssen**, Robert H., West Fargo, ND
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vWAØTRD **McCarthy**, George B., Albert Lea, MN
KCØVYT **Cole**, Daniel L., Lees Summit, MO
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v•WAØYGT **Dickerson**, Tommy J., Littleton, CO
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VP9KD **Carlington**, Walter, Southampton, Bermuda

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• System Fusion Compatible • Large Front Speaker delivers 700 mW of Loud Audio Output • Automatic Mode Select detects C4FM or Fm Analog and Switches Accordingly • Huge 1,105 Channel Memory Capacity • External DC Jack for DC Supply and Battery Charging

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• High-Res Full-Color Touch Screen TFT LCD Display • Easy Hands-Free Operation w/Built-In Bluetooth® Unit • Built-In High Precision GPS Antenna • 1200/9600bps APRS Data Communications • Supports Simultaneous C4FM Digital • Micro SD Card Slot

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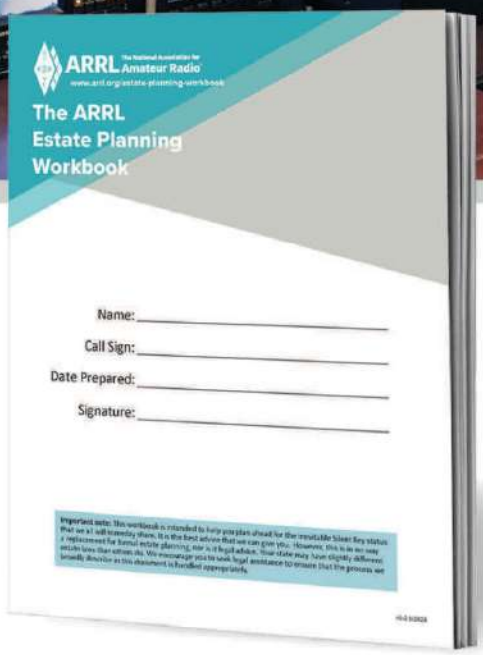

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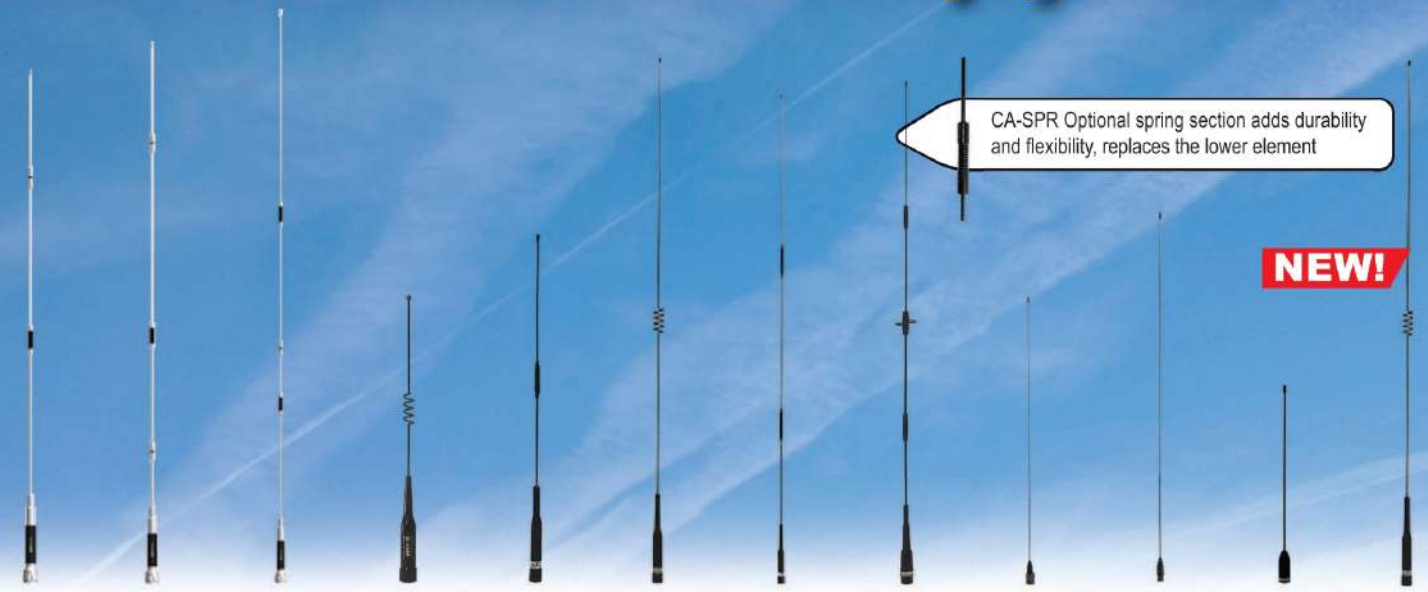

Mobile Antennas

❶ COMET **CSB-750A** DUAL-BAND 2M/440MHz w/FOLD-OVER
2M: 1/2 wave • 440MHz: 5/8 wave x 2 • VSWR: 1.5:1 or less • Length: 42" • Conn: PL-259 • Max. Pwr: 150W

❷ COMET **CSB-770A** DUAL-BAND 2M/440MHz w/FOLD-OVER
2M: 5/8 wave center load • 440MHz: 5/8 wave x 2 center load • VSWR: 1.5:1 or less • Length: 51" • Conn: PL-259 • Max Pwr: 150W

❸ COMET **CSB-790A** DUAL-BAND 2M/440MHz w/FOLD-OVER
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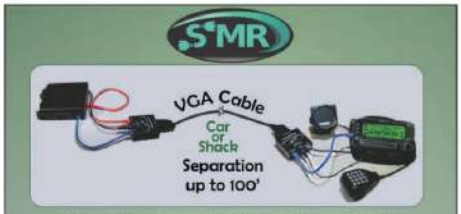

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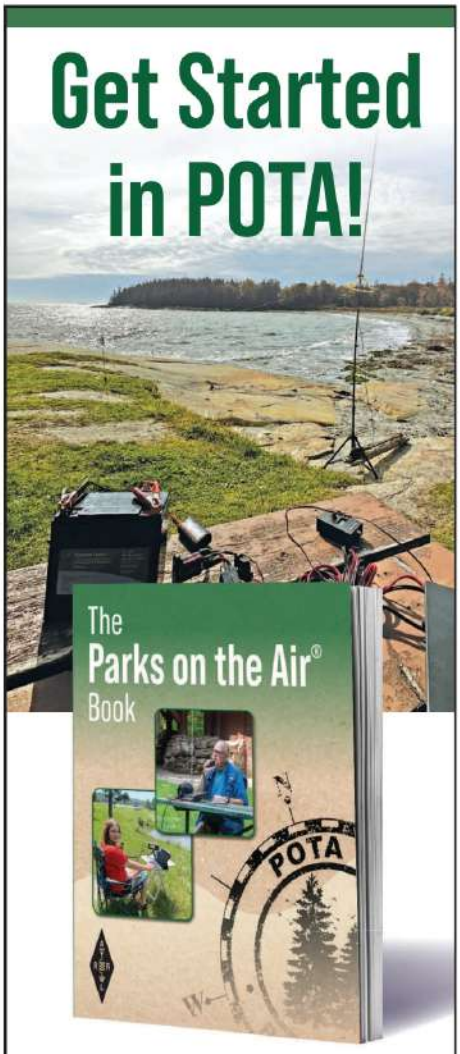

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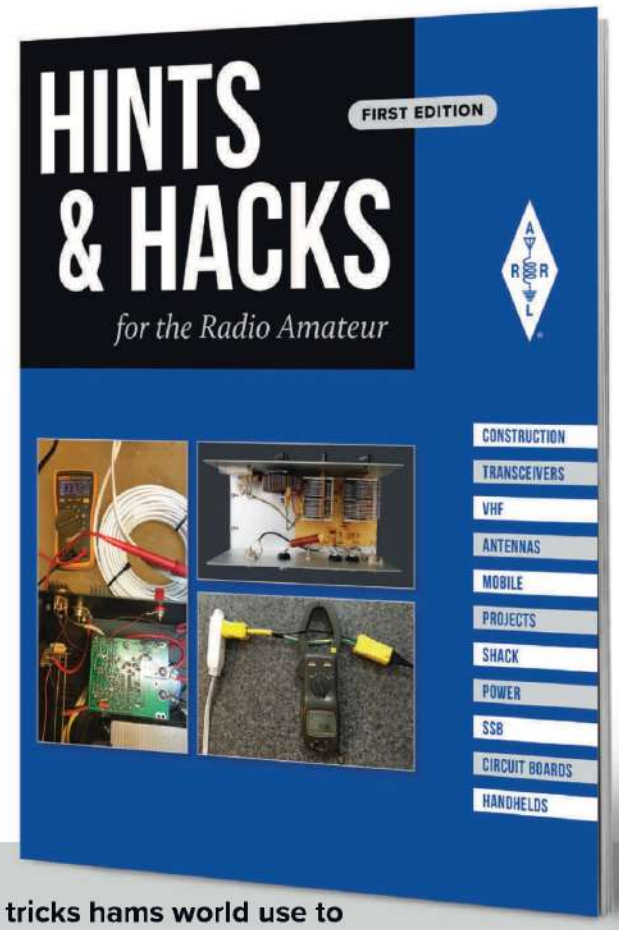

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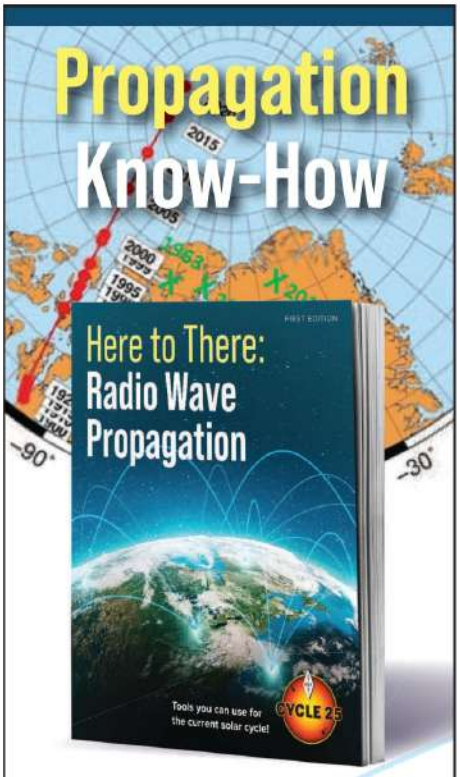

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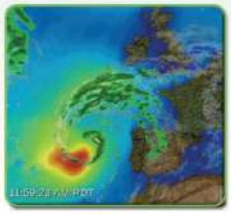

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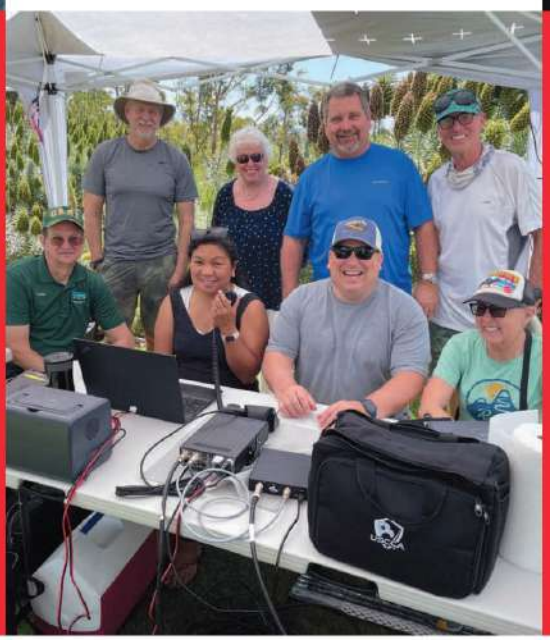

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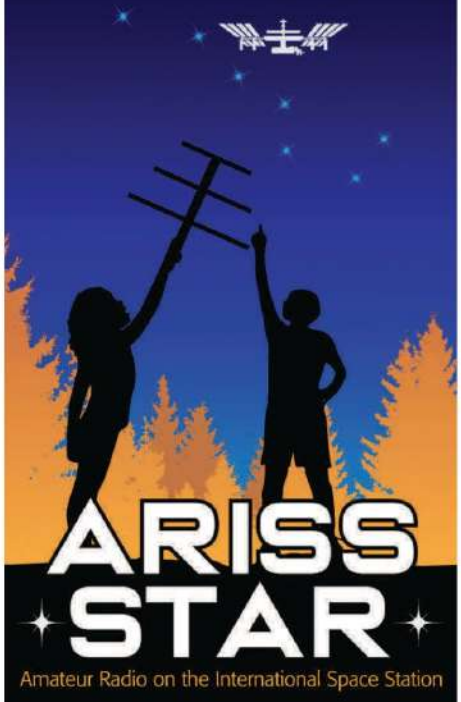

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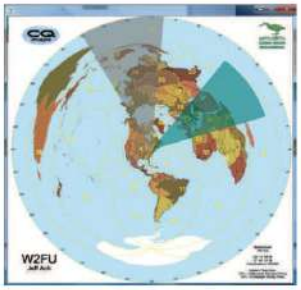

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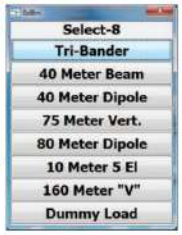

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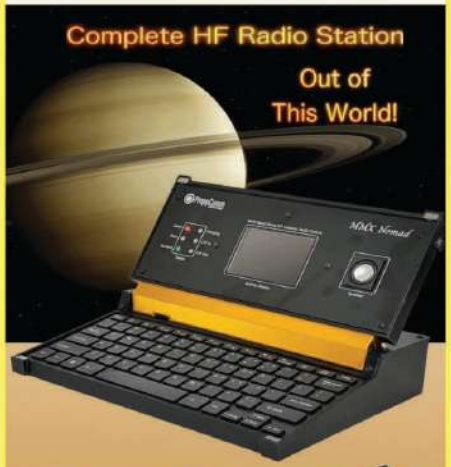

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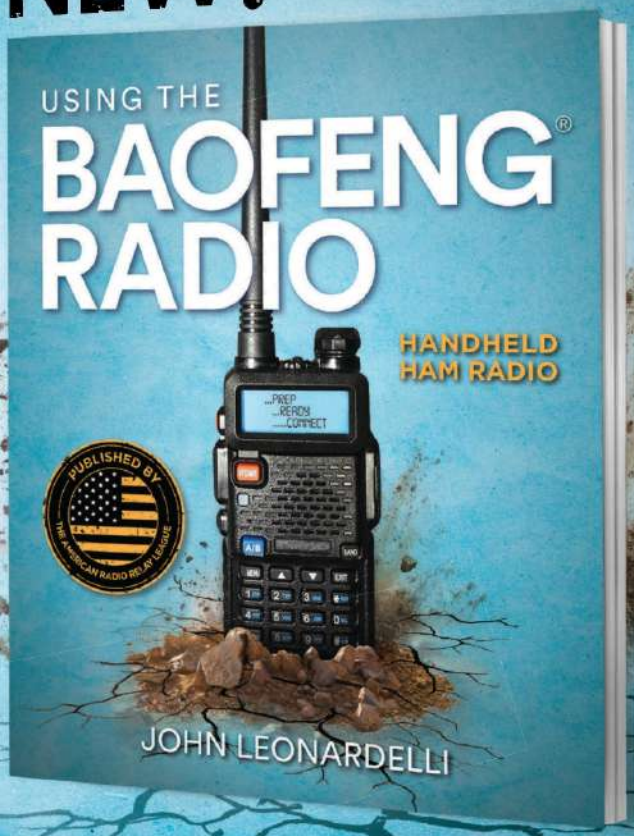

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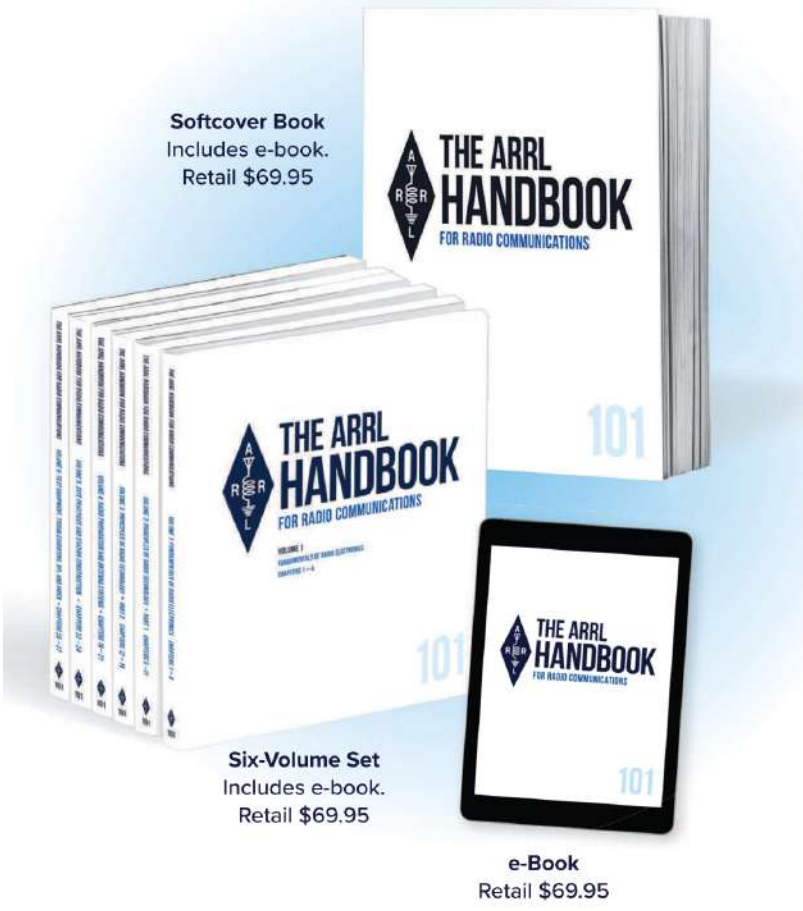

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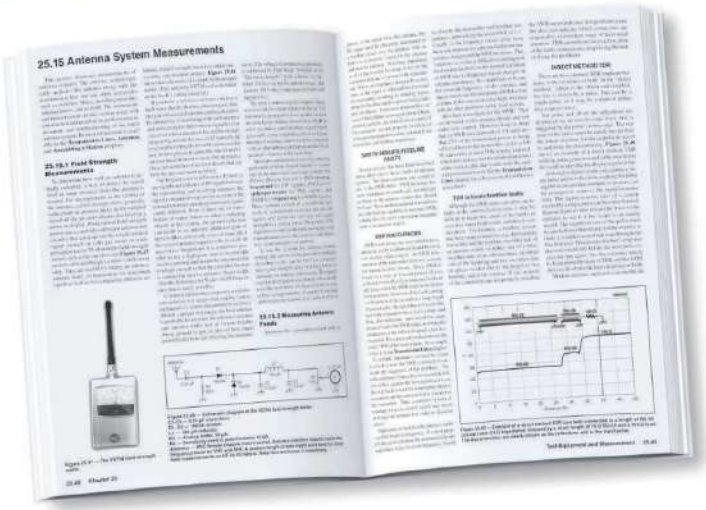

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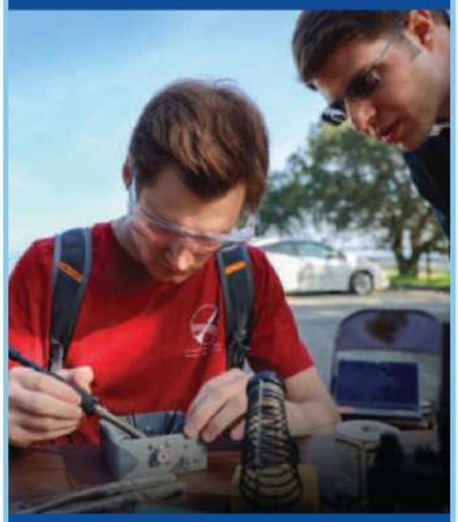

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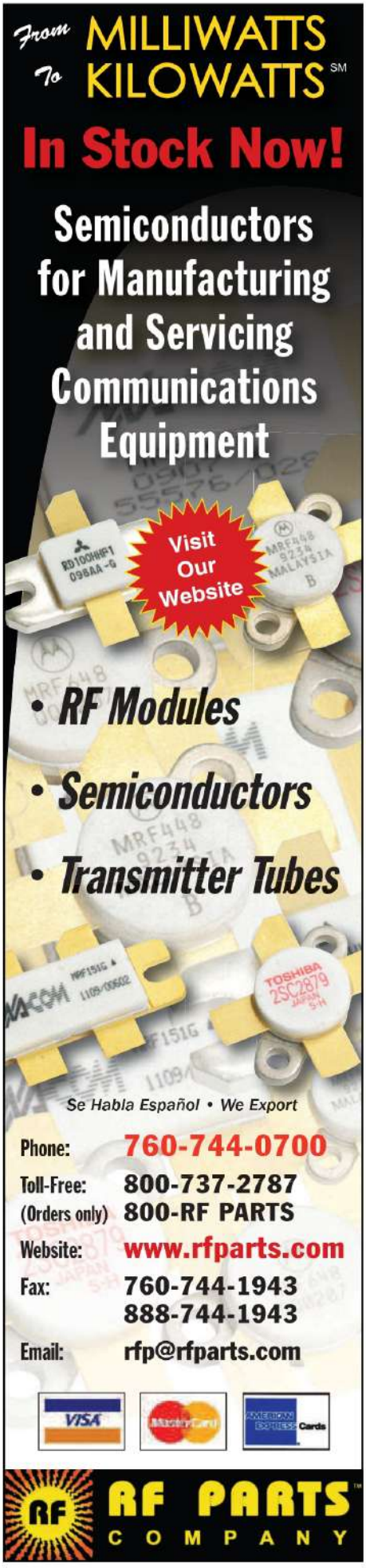

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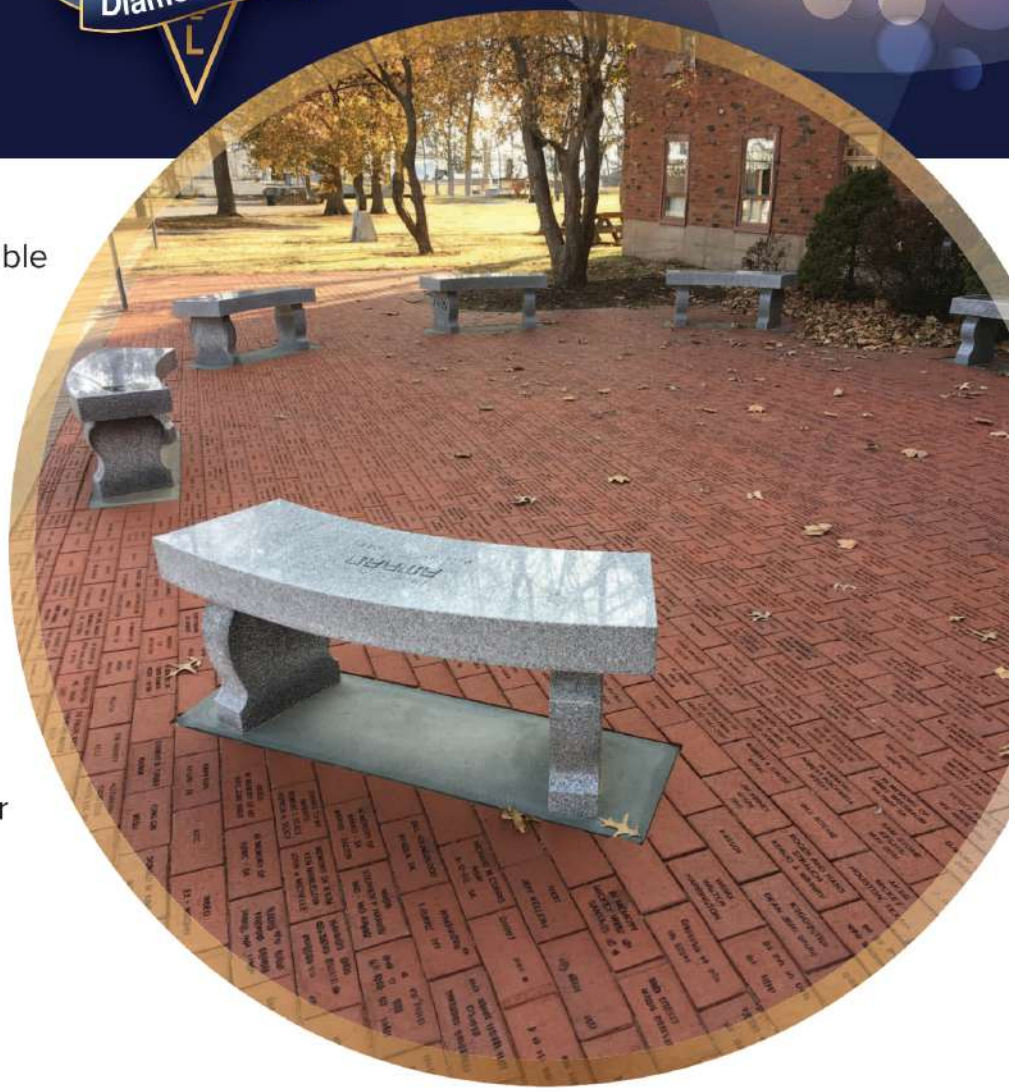

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