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September 2025

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Palstar AMU-1K Automatic Antenna
Tuning Network

Halibut Electronics EggNOGS
Antenna

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David A. Minster, NA2AA
Publisher

Becky R. Schoenfeld, W1BXY
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Editor

Tanajah Fryer
John McKenna
Assistant Editors

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Rick Palm, K1CE
Pascal Villeneuve, VA2PV
Paul Wade, W1GHZ
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Terese Newman
Assistant Production Supervisor

Matt Ali
Layout & Production Specialist

Maty Weinberg, KB1EIB
Production Coordinator

David Pingree, N1NAS
Senior Technical Illustrator

Janet Rocco, W1JLR
Advertising Relationship Manager

Bob Inderbitzen, NQ1R
Director of Marketing & Innovation

Steve Ewald, WV1X
Field Organization Supervisor

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Our Cover

There are some repairs you can make to your radio even if you're not an electrical engineer or a "techie." Sumner Weisman, W1VIV, walks you through the necessary skills, tools, and visual inspection cues to help you "Repair Your Radio Without Circuit Analysis." [Gregory Sulla photo]

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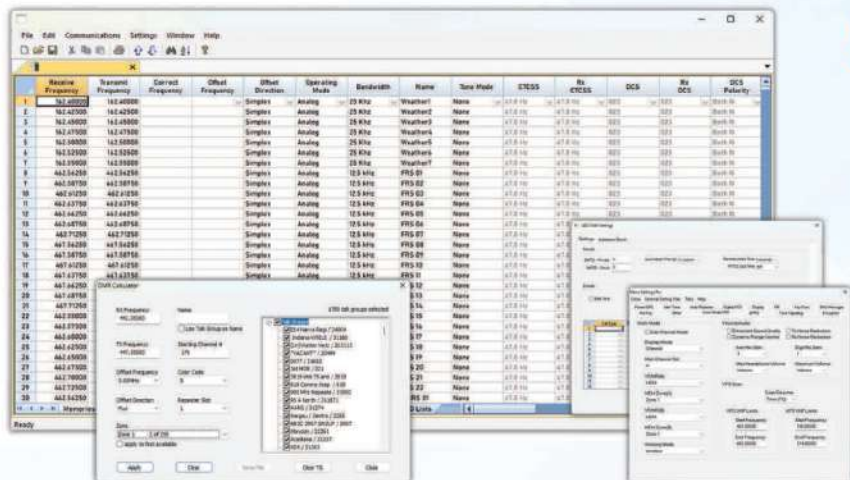
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F22A (2 Section)	2m	10.5	200	UHF
CP22E (Aluminum)	2m	8.9	200	UHF
F718A (Coax Element)	70cm	15	250	N
Dualband Mobile Antennas				
SG7900A	2m/70cm	62.2 in.	150	UHF or NMO
SG7500A	2m/70cm	40.6 in.	150	UHF or NMO
NR770H Series	2m/70cm	38.2 in.	200	UHF or NMO
MR77 Series	2m/70cm	20 in.	70	Mag Combo
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AZ504SP	2m/70cm	15.5 in.	50	UHF
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SG7900A

X300A / X50A

X700HNA



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Second Century

Making Elections Count

Election season for five ARRL Divisions (Pacific, Rocky Mountain, Southeastern, Southwestern, and West Gulf) is well under way. This is an important time for ARRL members in those Divisions to vote for whom they think should serve on the ARRL Board of Directors to help lead and steer the organization for the next 3 years.

As a membership association, there is — regrettably — a mishmash of notions about what ARRL once was, what ARRL is, what ARRL should be, and what the role of a Director or a Vice Director is. It was even a popular notion among some that ARRL is a representative democracy! In order to vote wisely, there are fundamentals you need to understand that should help bring some clarity to the choices set before you.

First and foremost, ARRL is a corporation. The Board is a group of 15 Directors who act together as a single body to make decisions and take actions. You should be considering that. Picking someone who has been around a while or who is a “real nice guy” are probably not the best parameters to use when voting for a Board member. Being a Director is far more work than showing up twice a year to vote. We know, because we have seen them, that Directors who function this way perform poorly on the Board. They have difficulty collaborating, generate few — if any — motions, and accomplish little with the opportunity they have.

Second, credentials matter. You may not realize that the ARRL Board and the ARRL Foundation Board each elect a Treasurer. Both organizations are extremely fortunate to have highly educated and deeply experienced leaders from the finance world who fill these positions. These are not ceremonial positions, but active positions that require extensive real-world knowledge. The ARRL Treasurer leads a group called the Investment Management Committee that likewise is comprised of remarkably experienced leaders from the finance community that aid in how ARRL manages its funds. When looking at candidates, consider what business chops they bring to the table.

Third, and perhaps most important for the future, is to consider how strong each candidate looks as a potential ambassador for ARRL and for amateur radio. Who among the candidates looks like an inspirational speaker and leader who can bring excitement to a club meeting or a convention? Which one can stand in front of a group of students and get them excited about the possibilities for a future vocation and avocation influenced by radio communications technologies? Does

one of the candidates make you feel good about being a member and a ham?

I made a very big mistake as a lifelong ARRL member. I almost never voted. I just assumed that ARRL would figure it out and that they would always have my back. I was right, but I was wrong. ARRL *has* always had my back. But I didn't do *my* part as a member by paying attention to the one thing ARRL really needed my feedback, my input, on: leadership.

Much work lies ahead for ARRL to advance our bold mission: to promote and protect the art, science, and enjoyment of amateur radio, and to develop the next generation of radio amateurs. This effort requires leaders who are dedicated to the cause, willing to roll up their sleeves, and able to set aside any notion of personal gain for the good of the organization. And if there was a job description, it might include “works well with others.”

So, in this upcoming election, be radio active! Please take the time to *be* a member. Carefully consider who *you* want to lead. Talk with the candidates. Take the time to read their statements. Go see them in person. Choose well. Be a connector! Make sure your friends and club members are paying attention too. See you in the upcoming contests!

David A. Minster, NA2AA
Chief Executive Officer

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3:1 manual tuning

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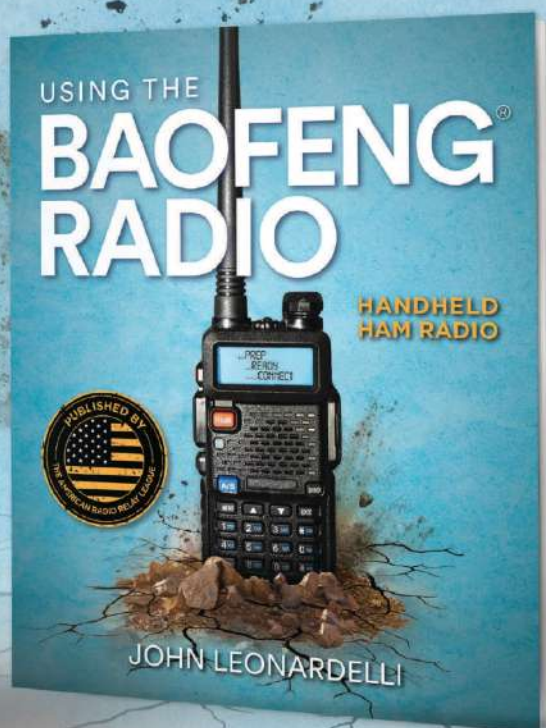
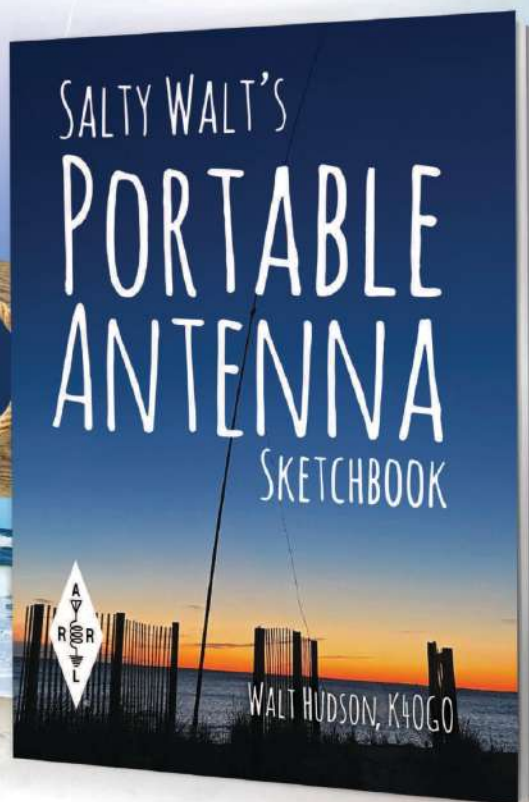
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Here's Why Seasoned Hams Choose These MLAs - Stealthy, HOA-Friendly, and Proven Performance:

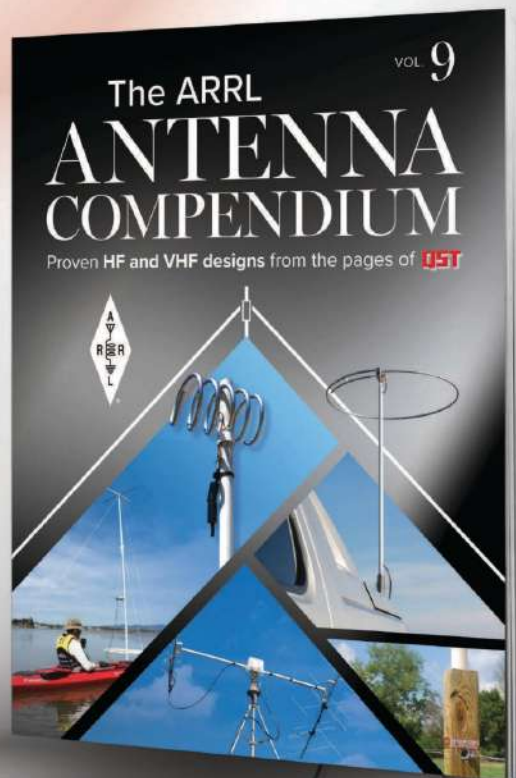
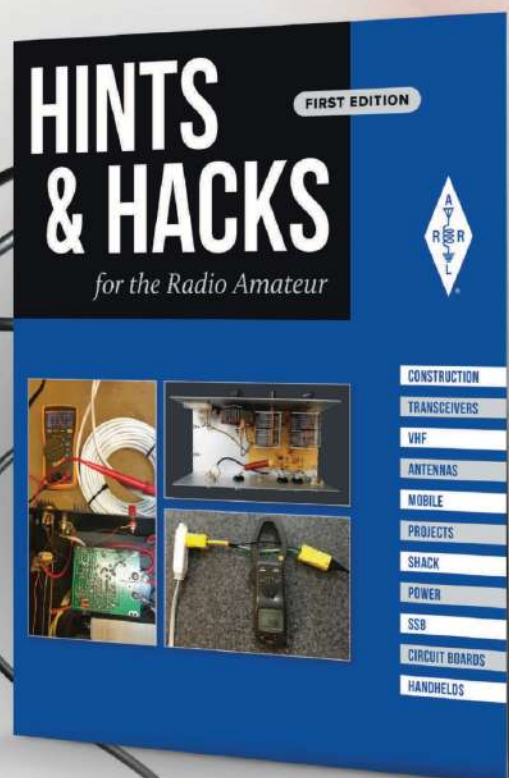
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Member Spotlight

Louis Linden, KI5TD

Louis Linden, KI5TD, was born on May 2, 1947, in Minneapolis, Minnesota. His interest in ham radio began in 1963 when Louis and his family moved to Fridley, Minnesota, during his junior year of high school. There, he formed a friendship with his chemistry teacher, Arnold Grier. Upon discovering that his teacher was a ham radio operator, Louis was invited to visit his teacher's ham shack and see the equipment he used. He was fascinated by his teacher's ability to communicate with people in other countries during a time when making a phone call outside the state was difficult. Louis's first QSOs took place in his teacher's basement. Additionally, he built a two-tube regenerative receiver using instructions from QST.

After earning a BA in social sciences from Shimer College, Louis was drafted into the army. Inspired by the lawyers who assisted him in leaving the army due to his conscientious objection, he decided to pursue law school at the University of Texas.

Emergency Communications

Louis has been actively involved in emergency communications with ARRL. In 2005, ARRL issued a call for radio operators to assist on the Gulf Coast in the aftermath of Hurricane Katrina. He loaded his HF and VHF equipment into his 12-year-old Lexus and made his way to Montgomery, Alabama. The journey took 2 days, after which he spent the night in Montgomery. The following day, he was sent to Gulfport, Missis-

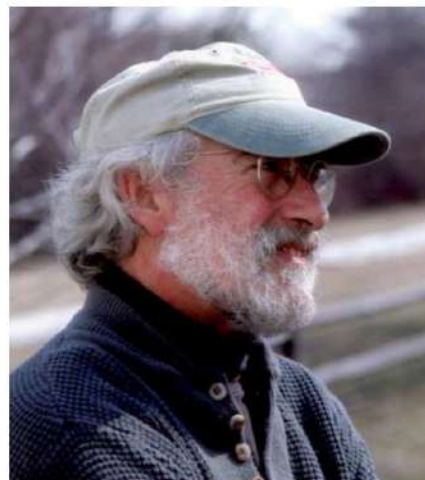
sippi, where he spent the next 10 days. During 7 of those days, he served as the net controller for the Red Cross logistical net, which coordinated support for the Mississippi coast, from Bay St. Louis to Biloxi. Louis feels privileged to have had the opportunity to practice his skills extensively in real conditions, as few people get to experience such a unique situation.

He was particularly impressed with ARRL's response during Katrina, highlighting its effectiveness. Louis mentioned, "When ARRL focuses on something, I think they do a really good job." He is grateful to the radio operators he worked with, stating that they made his job easier. Louis also admires the volunteers working at the Red Cross food warehouse who tirelessly battled the hot and humid weather.

Two years before Hurricane Katrina, Hurricane Isabel struck Maryland, and Louis kept in contact with the Baltimore City Amateur Radio Emergency Service (ARES). He spent some time stationed at a Red Cross shelter and later in net control at the Red Cross headquarters. Louis credits ARRL's emergency communications course for providing him with the knowledge and skills that enabled him to perform these tasks. He found the ARRL course to be informative and educational, allowing him to grasp the basics and learn everything he needed.

Highlight of Being a Ham

Louis's highlight of being a ham radio operator was the emergency



communication training he received for Hurricane Katrina. From 2003 to 2005, he spent three winters in La Mosquitia, Honduras. He participated in three missions with the International Health Service, serving as a radio operator, which prepared him for Hurricane Katrina.

Through his experience as a ham, Louis has discovered a strong sense of community. He often makes new friends by finding an antenna and introducing himself by his call sign.

Life Outside of Ham Radio

In addition to being a ham, Louis plays the banjo in a band, the Village Idiots. Although Louis has retired from motorcycle racing, for several years he managed the club that organized all motorcycle road racing events in Texas, Louisiana, and Oklahoma, now known as the Central Motorcycle Roadracing Association. Louis enjoys racing powerboats as a member of the Cocktail Class Wooden Boat Racing Association.

Guide to Member Benefits



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ARRL The National Association for Amateur Radio® in the United States: supports the awareness and growth of Amateur Radio worldwide; advocates for meaningful access to radio spectrum; strives for every member to get involved, get active, and get on the air; encourages radio experimentation and, through its members, advances radio technology and education; and organizes and trains volunteers to serve their communities by providing public service and emergency communications (ARRL's Vision Statement, adopted in January 2016).

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ARRL is noncommercial, and no one with a pervasive and continuing conflict of interest is eligible for membership on its Board.

"Of, by, and for the radio amateur," ARRL numbers within its ranks the vast majority of active amateurs in the nation and has a proud history of achievement as the standard-bearer in amateur affairs.

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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

Treasurer
John Sager, WJ7S

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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, AC0W*
2013 6th Ave. SE, Austin, MN 55912
507-993-9181; ac0w@arrl.org

Vice Director: Lynn Nelson, W0ND
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, K0AIZ*
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

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

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125 Coolidge Ave. #803
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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
John Litz, N26Q
1434 Douglas Rd., Stockton, CA 95207
209-687-0774; n26q@arrl.org

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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, K0RM*
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

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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
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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, AE0EE, 7412 Colfax Ave. S., Richfield, MN 55423 510-529-5658; ae0ee@arrl.org

North Dakota: Ralph Fettig, N0RDF, 6650 County Rd. 12 W., Minot, ND 58701-3003 701-822-3467; n0rdf@arrl.org

South Dakota: Chris Stallkamp, K10D, P.O. Box 271, Selby, SD 57472-0271 605-848-3929; k10d@arrl.org

Delta Division AR, LA, MS, TN

Arkansas: James D. Ferguson, Jr., N5LKE, 1500 Lauren Dr., Searcy, AR 72143-8477 501-593-5695; n5like@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, NNY

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, W0IY, 4109 Cedar Heights Dr., Center Point, IA 52213-9206 319-651-4985; w0iy@arrl.org

Kansas: Ronald D. Cowan, KB0DTI, P.O. Box 36, La Cygne, KS 66040 913-757-4456; kb0dti@arrl.org

Missouri: Cecil Higgins, AC0HA, 27995 County Rd. 220, Hermitage, MO 65668-8493 417-493-8208; ac0ha@arrl.org

Nebraska: Matthew N. Anderson, KA0BOJ, 14300 NW 98th St., Raymond, NE 68428-4254; 402-480-5515; ka0boj@arrl.org

New England Division CT, MA, 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: Don Lynn, ND7L, 41 N. Hastings Dr., Nampa, ID 83687-7504 208-899-5801; nd7l@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, N0CSM, 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 Sombereite 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; w7gc@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: Jimmy Russ, AB4KA, 560 S. Clayton Ave., Lakeland, FL 33801-5408; 912-809-7570; ab4ka@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, AL6DF, P.O. Box 4678, Palos Verdes Peninsula, CA 90274-9618; 310-544-2917; al6df@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 405-410-6758; n5hzz@arrl.org

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

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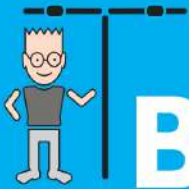
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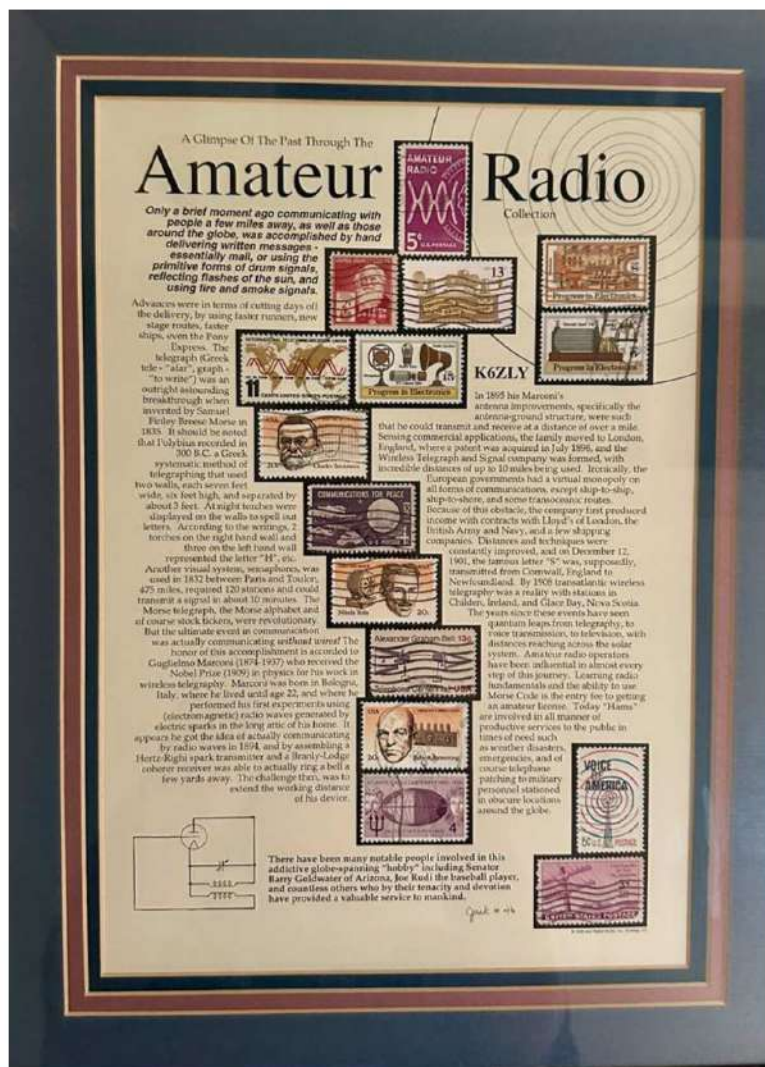
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Up Front

A Piece of Amateur Radio History

This “A Glimpse Of The Past Through The Amateur Radio Collection” art, created by Jack Rabbit Studio in Durango, Colorado, was gifted to Dean Albertsen, KØTVJ, by his family. It relays the history of communication and radio through the years — from Greek visual telegraphing techniques to Marconi, and beyond — and includes a collection of vintage postage stamps featuring innovators in communication and significant milestones across the ages. It has a prominent place in Dean’s ham radio station in Sun Lakes, Arizona.



“A Glimpse Of The Past Through The Amateur Radio Collection.” [Dean Albertsen, KØTVJ, photo]



[Rick Alderette, KB1ASM, photo]

QST on the Go

Rick Alderette's, KB1ASM, wife gifted him a new winter coat, complete with a convenient QST pocket. Now, Rick won't have to roll up the magazine and stuff it into his back pocket every time they go out!



[Mark Edwards, WØQL, photo]

Best Ham

Spotted by Mark Edwards, WØQL, at Barcelona-El Prat Airport in Barcelona, Spain, this sandwich shop assures all radio amateurs traveling through that they are the “Best Ham in the airport” — and if that’s not a “premium take away,” what is?

If you see something ham-related out in the world, take a photo of it and send it to upfront@arri.org.

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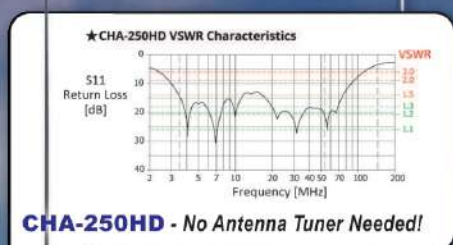
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Wavelength: 146MHz 6/8 wave • 446MHz 5/8 wave x 3 • Gain-146 MHz: 4.5dBi / 446 MHz: 7.2dBi • Max Pwr: 200W • Length: 5'11" • Weight: 2lbs. 9ozs. • Conn: Gold-plated SO-239 • Construction: Single-piece fiberglass

3 COMET GP-6 DUAL-BAND 146/446MHZ BASE REPEATER ANTENNA

Wavelength: 146MHz 5/8 wave x 2 • 446MHz 5/8 wave x 5 • Gain-146 MHz: 6.5dBi / 446 MHz: 9dBi • Max Pwr: 200W • Length: 10'2" • Weight: 3lbs. 8ozs. • Conn: Gold-plated SO-239 • Construction: Fiberglass, 2 Sections

4 COMET GP-9 / GP-9N DUAL-BAND 146/446MHZ BASE REPEATER ANTENNA

Wavelength: 146MHz 5/8 wave x 3 • 446MHz 5/8 wave x 8 • Gain-146 MHz: 8.5dBi / 446 MHz: 11.9dBi • Max Pwr: 200W • Length: 16' 9" • Weight: 5lbs. 11ozs. • Conn: GP-9 Gold-plated SO-239 • GP-9N Gold-plated N-type female • Construction: Fiberglass, 3 Sections

5 COMET CX-333 TRI-BAND 146/220/446MHZ BASE REPEATER ANTENNA

Wavelength: 146MHz 5/8 wave x 2 • 220MHz 5/8 wave x 3 • 446MHz 5/8 wave x 5 • Max Pwr: 120W • Length: 10'2" • Weight: 3lbs. 1oz. • Conn: Gold-plated SO-239 • Construction: Fiberglass, 2 Sections

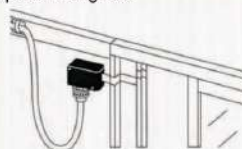
6 COMET GP-15 TRI-BAND 52/146/446MHZ BASE REPEATER ANTENNA

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Correspondence

Letters from Our Members

Homebrew Projects Are Timeless

Throughout my years as a ham, I've operated a Heathkit AR-3 and DX-20, a Collins Radio KWM-2, two KD1JV Tri-Banders, and an Elecraft K2. My sequence of interests has gone from making long contacts, to DXing, to participating in contests, to experimenting. Throughout my journey, I've found that the thrill of each of these aspects of the hobby can fade over time, and sooner or later, one may become curious about the details of electronics technology. For example, some amateurs who have lost interest in operating CW or voice at 1,500 W might wish to pursue homebrew projects at the QRP level — it's safer and cheaper.

Over the years, *QST* has published many fascinating homebrew designs by Doug DeMaw, W1FB; Wes Hayward, W7ZOI, and others that are still relevant today. New hams can still build them and grow their skills and knowledge. I didn't build every homebrew radio that I read about in older issues of *QST*, but simply reading the articles contributed to the spirit of the hobby that kept me interested. Some of the tools that I did end up building (an RF probe, an attenuator, a power meter, an SWR bridge, and others) I still use today.

Charles Hooker, VE3CQH
East Garafraxa, Ontario, Canada
International Life Member

Adding Interest to Weekly Nets

I was net control for my club's Sunday night VHF net and noticed that participation on some nights was sparse. I thought a lot about how to make the net more appealing to increase the number of check-ins,

and we began initiating a Sunday Night Question of the Week. After checking in, each person is given a question from *The ARRL General Class License Manual* or *The ARRL Extra Class License Manual* to answer. It has been quite successful in making our nets more interesting, and we do it with four alternating net controls. I'm sure this is not a new idea, and that other radio clubs are doing similar things; a bonus for our club has been that members are now more knowledgeable and are constantly learning. Some of our net controls are even writing their own questions.

Sumner Weisman, W1VIV
Framingham, Massachusetts

A Shoutout to POTA Hunters Who Post QSOs

Some unsung Parks on the Air® (POTA) heroes are hunters who take the time after a contact to post it with an activator. It lets other hunters know the activator is active, and it may also show the signal strength. On behalf of the many activators, let me say that it's really appreciated — POTA on!

Colin Wheatley, W9UPK
Dubuque, Iowa

A New CW Requirement?

Techs getting licensed but not becoming active seems to be an ongoing problem. In his March 2025 "Second Century" column, David Minster, NA2AA, suggests that radio clubs are the lifeblood of our hobby, helping newcomers become active. This may be true, but in the past, many hams got licensed and became active in other ways, such as through the Novice license. Perhaps it's time to bring that license class

back with a minimal CW requirement and limited HF privileges.

There are a few reasons that this might work. First and foremost, HF is where the action is. The thrill of contacting stations across the country and around the world hooks people quickly. By including the CW requirement, new hams have a way to make contacts with lower power and less elaborate antennas. Secondly, CW eliminates the mic fright that many new hams encounter. Lastly, used CW equipment is readily available and lower in cost than new equipment, and CW signals can punch through where SSB cannot.

Some will say that learning CW is, by itself, a barrier to entry and this may be so for some. However, between the Novice license that required CW and the Tech class that doesn't, there would be another entry point through which new people can become active ham radio operators.

Art Malatzky, WB2WFJ
Killington, Vermont

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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.

♦ Voicetransmissions: 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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^{*1}: APRS® (The Automatic Packet Reporting System) is a registered trademark of TAPR (Tucson Amateur Packet Radio Corp.)

^{*2}: D-STAR is a digital radio protocol developed by JARL (Japan Amateur Radio League).

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The PERformer — A Portable, Elevated, and Resonant Quarter-Wave Antenna

This antenna won second place in the 80 through 10 meters category of the 2024 QST Antenna Design Competition; it covers 40 – 6 meters.

Greg Mihran, KJ6ER

I developed the PERformer quarter-wave antenna primarily for portable operations. Extensive computer modeling in *4NEC2* provided optimal whip and elevated tuned radial lengths for each of the bands. I typically measure a standing wave ratio (SWR) of 1.20:1 or better on each of the bands, so an external antenna tuner is not needed. Through extensive modeling, I have found that this elevated vertical is extremely effective, with high radiation efficiency of more than 90 percent on the 20 – 6-meter ham bands. Here, I will focus on the assembly, testing, and operation of the PERformer. The technical details can be found at www.arrl.org/qst-in-depth.

PERformer Description

The PERformer consists of a telescoping vertical element (radiator) and two elevated, tuned linked radials oriented 90 or 180 degrees apart. Within the radials' 90-degree span, it provides modest 0.3 – 0.5 dBi gain and a 3 – 4 dB front-to-back ratio at a 24-degree takeoff angle. For an omnidirectional radiation pattern, the two elevated radials are placed 180 degrees apart (opposite each other). Having elevated, tuned linked radials dramatically reduces near-field ground losses and increases radiation efficiency, versus a purely ground-mounted vertical with ground-coupled radials, window screen, or Faraday cloth. I modeled different numbers and spans of elevated radials, and I concluded that having more than two radials provided little benefit. Also, two elevated radials provide slightly more antenna gain, efficiency, and improved SWR than a single elevated radial. A good-quality RF choke must always be inserted directly at the feed point so that the coaxial feed line does not become part of the antenna system. A pictorial of the PERformer is shown in Figure 1, including the radial lengths for each band. Summarized notes on the radial system are in the sidebar, "PERformer Radial System," and these further illustrate Figure 1. Table 1 is my recommended list of parts; it includes links to where I sourced some products, but you can find several of them elsewhere.



The PERformer on a PVC mount.

PERformer Construction

This telescoping whip covers 20 – 6 meters. For 40 meters, install an inductor (such as the Wolf River Coils Sporty Forty or the Chameleon CHA M-COIL) at the base of the whip. Clip the two 20-meter, 16.5-foot radials end to end with the two fiberglass stakes (one in the center and one at the end) to make one elevated 33-foot, 40-meter radial. While it works well, the efficiency will be lower than on the higher bands due to loading inductor Q, the lower radiation resistance of the shortened vertical element, and the single elevated radial.

I prefer using a PVC spike mount for my deployments, but you can use a lightweight tripod instead. A 40-inch furniture-grade PVC tube and the Chameleon spike mount permit me to easily reach the telescoping whip to adjust it for the desired band. Furniture-grade PVC

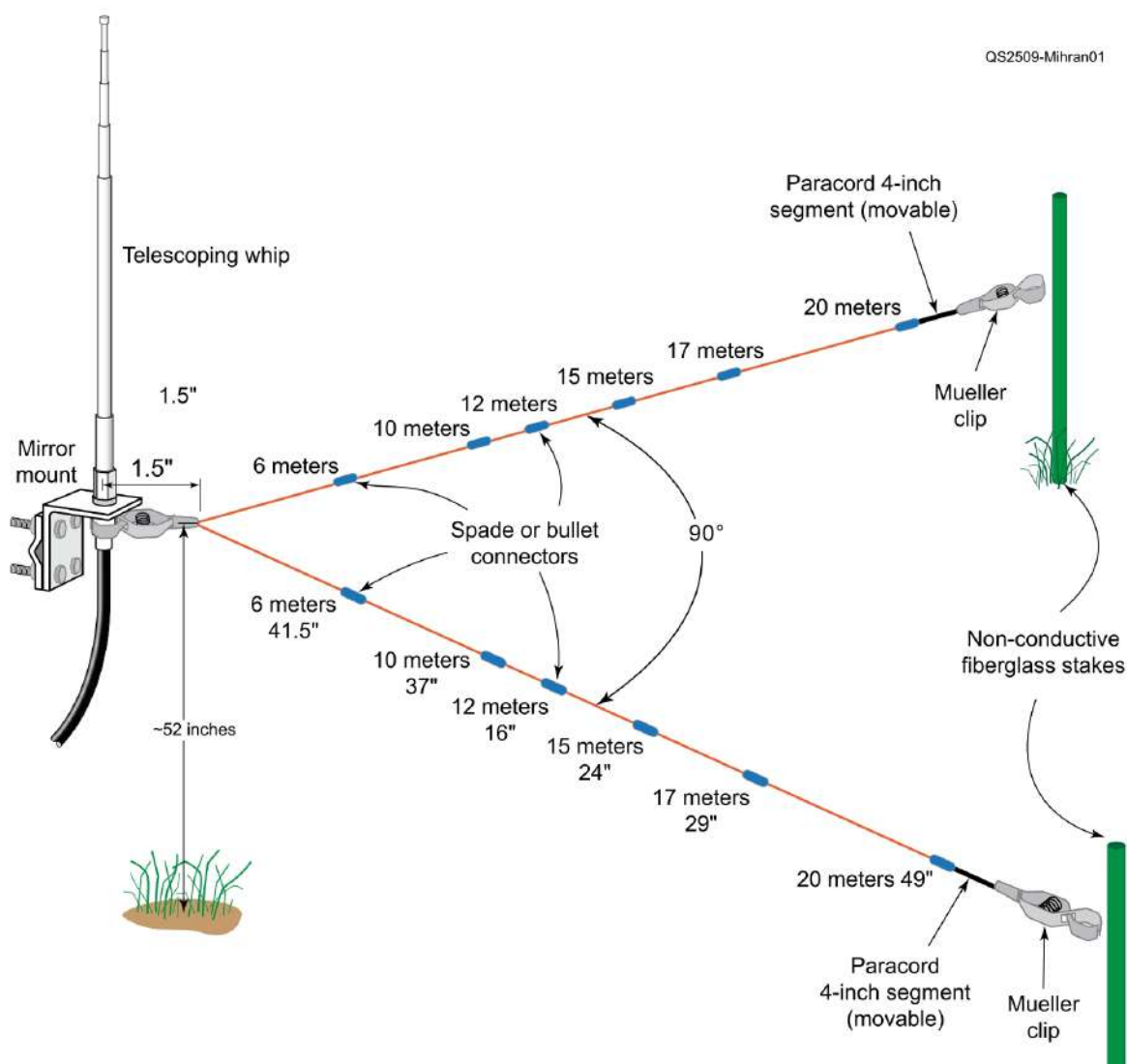


Figure 1 — A diagram of the PERformer, with radial lengths for each band. Insert a movable, non-conductive segment to select the desired radial length.

has thicker walls than regular PVC and will provide good support, especially in windy conditions.

For the top PVC end cap (see Figure 2), drill a $\frac{3}{8}$ -inch hole for a $\frac{3}{8}$ -24 fine thread bolt, and secure it with a $1\frac{1}{2}$ -inch $\times$ $\frac{3}{8}$ -24 coupling stud on the outside. Split lock and fender washers provide a tight fit. The bolt connects to a mirror mount with a $\frac{3}{8}$ -24 coupling nut and an SO-239 connector on a short, base-threaded aluminum rod. The Chameleon 17-foot telescoping whip screws into the coupling nut.

For the bottom PVC end cap (see Figure 3), drill a $\frac{3}{8}$ -inch hole for a $1\frac{1}{2}$ -inch $\times$ $\frac{3}{8}$ -24 bolt to connect with the Chameleon spike mount. I typically try to insert the spike about halfway into the ground for a stable base. In moist California soil, I can push the spike in the ground with my hand. If I am in a location with harder-packed soil, I use a rubber mallet to tap it in. With the

PERformer Radial System

- Each band that the PERformer covers requires two elevated, tuned radials that are 90 degrees apart; these are connected to the feed-point ground by a Mueller clip.
- Each radial is terminated by another clip to a non-conductive fiberglass stake, which is inserted into the earth.
- Incremental radial lengths are interconnected by spade or bullet connectors for fast, easy band changes in the radial lines.
- Fiberglass stakes can be moved to accommodate each radial length. However, a better option would be to insert a short, non-conductive segment (e.g., a 4-inch paracord with connectors) into the wire line; this would terminate the radial at that point without the need to move the stakes for each band change.

Table 1 — PERformer Recommended Parts List

Qty	Part Description	Price (USD)	Source
1	17-foot telescoping whip	\$70	www.chameleonantenna.com/products/stainless-steel-whip
1	Furniture-grade 1-inch PVC (one 40-inch-long tube)	Price subject to source	
2	1-inch PVC flat end cap	Price subject to source	
1	$\frac{3}{8}$ -24 $\times$ 4-inch fine thread bolt (for top end cap)	\$8	www.mcmaster.com/catalog/131/3604/92800A392
1	$\frac{3}{8}$ -24 $\times$ 1.5-inch fine thread bolt (for bottom end cap)	\$6	www.mcmaster.com/catalog/131/3600/92240A358
1	Spike mount for PVC	\$70	www.chameleonantenna.com/products/cha-spike-mount
1	74-inch tripod (optional; PVC tube alternative)	\$60	www.amazon.com/dp/B0CDKFJLX7
1	RF feed-line choke	\$30	www.palomar-engineers.com/antenna-products/1-1-balun-kits/jumper-choke/Coax-Jumper-Choke-RG-8X-RFI-Range-1-8-65-MHz-30-dB-Noise-Reduction-1-5KW-PEP-Magnetic-Loop-Antenna-Choke-p159344870
1	Mirror mount	\$14	www.amazon.com/dp/B07GDGVSQ7
1	#18 AWG radial silicone wire (30 feet required)	\$18	www.amazon.com/dp/B01MPZJOYN
3	Steel clip for radials	Price subject to source	
2	4-foot fiberglass stake	Price subject to source	

spike and mirror mount, the feed point is about 52 inches off of the ground. Figure 4 shows the completed whip mount assembly. The lead photo shows the PERformer's PVC support deployment.

To construct the linked radial system, cut a 6-meter radial pair with a 41.5-inch length of wire. The radials will each have a total length of 43 inches, with the Mueller clip attached on one end and the spade

connectors on the opposite end. Next, cut pairs of incremental wire segments for each of the other five bands, and attach the spade connectors. Once you cut all of the incremental sections, connect the six band segments together in a single string to make a 198-inch 20-meter radial. Add a short end-point pigtail (made of any non-conducting material) with a Mueller clip. Make sure that the band segments are all connected in the correct order (6, 10, 12, 15, 17, and 20 meters). It is important to label each band segment; I use a sticky printed label folded over itself on each wire segment. The Mueller clip at the far end of each radial is attached to a non-conductive elevation stake.

To ensure tension on the radials, insert the fiberglass stake into the ground at a 60-degree angle, with the clip about halfway up the stake. After that, slide the clip up to the top until the radial is taut. A little sagging in the line is fine. When using the non-conductive segments in the radial line, the droop angles will remain consistent at 5 degrees for all bands. To compensate, the radiator is slightly extended, and the radials are shortened to achieve a low SWR at resonance. Figure 5 is a photo of the individual radial segments, and Figure 6 is a photo of the 4-inch non-conductive segments connected with paracord (as



Figure 2 — The top PVC end cap.



Figure 3 — The bottom PVC end cap.



Figure 4 — The completed whip mount assembly.

mentioned, you can use any non-conductive material). You can easily package the radials and 40-meter coil in a clear plastic travel bag, as shown in Figure 7.

Fine-Tuning

When you initially deploy the antenna, extend the two elevated radials until they're fully taut, with all band wire segments connected, including the 4-inch non-conductive section at the end. Using an antenna analyzer or SWR meter, fine-tune the PERformer by slightly adjusting the length of the telescoping whip once you've set the radials' lengths for a specific band. Because every portable deployment will have different soil and near-field surroundings, start with the documented settings of the telescoping whip for the band of interest, and then make the adjustments. The precise whip length might slightly vary at each deployment location.

To change bands, adjust both the length of the telescoping whip and the two elevated radials. Once the elevated radials are extended with the stakes,



Figure 5 — The radial segments.

insert the two non-conductive segments between the specific band segments; this terminates the radials at that point for the desired band. For example, if you want to operate on 15 meters, insert the non-conductive segments between the 15- and 17-meter wire segments. For 20 meters, insert the non-conductive segments between the 20-meter wire segments and the end-point Mueller clips.

Table 2 shows the actual antenna analyzer SWR measurements I achieved for 20 – 6 meters. The associated RigExpert AA-55 ZOOM sweeps are shown at www.arrl.org/qst-in-depth, and they highlight the broad-banded nature of the antenna.

Living Up to Its Name

For me, a key feature of a portable antenna is not only its performance, but the elegance of its deployment. The PERformer is my primary quarter-wave vertical antenna, and I strongly encourage you to try your own implementation. The elevated, tuned, and linked radial system has performed extremely well for me. I can deploy the PERformer with the elevated radials in a couple of minutes, and band changes take less than

Table 2 — PERformer SWR Field Measurements on 20 – 6 Meters			
Band (Meters)	Minimum SWR/ Frequency (MHz)	Lower-Band Edge/SWR	Upper-Band Edge SWR
20	1.02:1/14.035	1.3:1	1.18:1
17	1.02:1/18.1	1.03:1	1.14:1
15	1.01:1/21.245	1.21:1	1.18:1
12	1:1/24.932	1.02:1	1.02:1
10	1.2:1/28.470	1.24:1	1.8:1
6	1.1:1/52.05	1.8:1	1.8:1

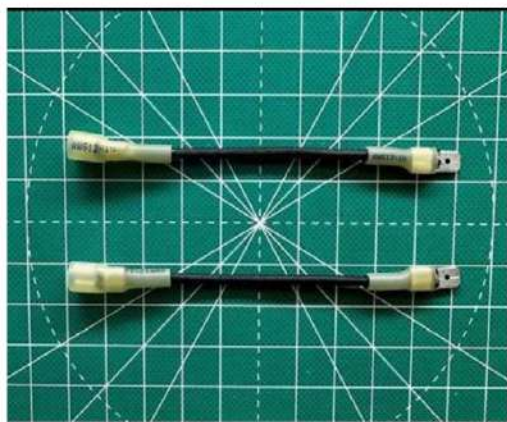


Figure 6 — The non-conductive segments.

a minute. When it is time to leave, the antenna is fast and easy to pack up.

The PERformer can also be used at your home station, and it is especially useful in neighborhoods with antenna limitations because of its quick deployment. Keep in mind that you will have to adjust the telescoping whip length and the set of tuned radials for the band you want to operate on.

One of my favorite parts of ham radio is experimentation — especially with portable antennas. Give the PERformer a try and have some fun! If you have any questions, I'd be happy to help.

See QST in Depth for More!

Visit www.arrl.org/qst-in-depth for the following supplementary materials and updates:

- ✓ More technical details about the PERformer
- ✓ The RigExpert AA-55 ZOOM sweeps associated with the SWR measurements for 20 – 6 meters



Figure 7 — The packaged radials and 40-meter coil.

All photos provided by the author.

Greg Mihran, KJ6ER, was first licensed in 1987. He obtained his BSEE from the Case Institute of Technology at Case Western Reserve University in Cleveland, Ohio. He moved to Silicon Valley after graduation and went to work at Hewlett-Packard, where he worked for more than 20 years in business development, marketing communications, and new ventures. Greg later worked as an interim executive in Silicon Valley venture-funded startups and Cisco Systems, and he finished his career at Flex International. He retired in 2022. Greg is active in Parks on the Air®, with more than 1,000 park activations and more than 80,000 SSB contacts. He gives regular Zoom presentations about portable antennas to amateur radio clubs. You can reach Greg at gmihran@me.com.

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Repair Your Radio Without Circuit Analysis

Simple and safe equipment fixes for hams with little or no technical knowledge.

Sumner Weisman, W1VIV

I've enjoyed the ham radio hobby for more than 70 years and have had to learn a few things about occasional repairs to my transceivers and accessories. Although I'm an electronic engineer and understand electrical circuits and components, I've met many hams who don't have technical backgrounds.

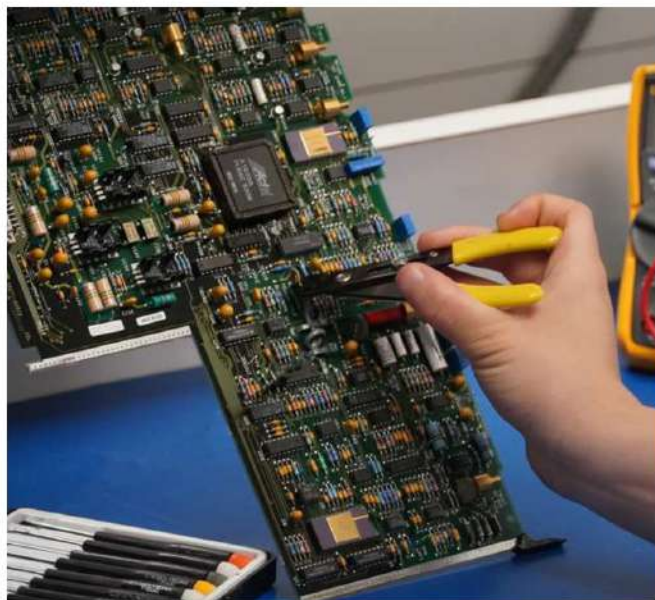
There are many advantages to fixing equipment by yourself: It's hard to find a good repair shop, and if you do find one, they will typically only replace an entire subassembly with a very expensive new one. By contrast, you may be able to troubleshoot right down to the component level and replace only a little resistor or capacitor. Also, you can use the repaired unit immediately, oftentimes the cost for repairs is minimal, and you'll have a feeling of pride and confidence.

I've put together some simple equipment fixes. You may find that older radios are often easier to work on, because the newest devices are compact and loaded with surface-mounted components and integrated circuits, which often require special skills to repair. Older radios are roomier and typically have discrete components mounted on double-sided printed circuit boards (PCBs). Finally, because these techniques won't fix all common problems, I will cover a few points where some circuit knowledge is desirable.

Hone Your Soldering Skills

If you want to repair your radio without circuit analysis, you need to be able to solder well; newer radios usually have crowded circuit-board layouts. You'll need a small-pointed soldering iron rated at about 25 W, a roll of small-diameter 60/40 tin-lead solder, and accessories, such as a solder sucker and a solder wick. It's common for radio clubs and hamfests to offer courses on soldering. Lessons can also be found on YouTube. The more you practice, the more skillful you will become.

You should also have a few good-quality tools — small and medium flat- and Phillips-head screwdrivers, small Allen wrenches (or hex keys) for tightening loose radio knobs, small needle-nose pliers, wire cutters, nut drivers, etc. Also, an inexpensive volt-ohm-milliammeter allows you to test components and voltages.



Once you've acquired adequate soldering skills, you can take on tasks like replacing a worn-out microphone cable or a noisy fan in a power supply. For example, the coil cable from my mobile radio's microphone had a plastic outer shell that was gradually disintegrating. I unsoldered eight little wires from eight tiny PC pads on the microphone end and eight little pins on the connector end, then I carefully installed the new cable. The repaired microphone worked perfectly. I didn't have to worry about things like push-to-talk connections or shielding the audio output because this was close to an exact replacement, apart from different wire color codes. I avoided having to buy a new microphone, and I spent a fraction of the cost repairing it.

Another one of my recent repair projects involved replacing the increasingly noisy cooling fan in my MFJ switching power supply. I purchased and installed a new cooling fan, and the supply is now as quiet as when it was new (see Figure 1). Don't be afraid to try your hand at simple repairs like these. Oftentimes, little or no technical knowledge is required.

Perform Thorough Visual Inspections

I have long believed that many equipment problems can be diagnosed by completing a good visual inspection, which is done without power applied to the radio, so there's no risk for electric shock (see the sidebar "Use Caution When Working with Electricity" for advice on handling potentially dangerous voltages). I have an illuminated magnifying lamp on my workbench (see Figure 2), but using the flashlight in your smartphone with a handheld magnifying glass will do the job just as well. Here are some examples of repairs you can make without knowledge of electronic circuits, after careful visual inspection.

- **A cracked copper PCB conductor** — This can happen after years of heating and cooling, causing board expansion and contraction. First, clean the surfaces on both sides of the crack, then bridge the crack by soldering a piece of tinned copper wire across it. I like to use a small jackknife blade for cleaning, and I have a roll of 26 AWG tinned copper wire for the bridging.
- **A burnt capacitor** — If there are several similar capacitors on a board, and one is darker or burnt-looking, try replacing that component. If the capacitor was shorted and caused other problems like a damaged power supply, additional repairs may be needed.
- **A resistor that got too hot** — A blackened area on the PCB under a resistor, or a darkened resistor, indicates that the resistor got too hot. Replacing it may be all that is needed. Again, it's a good place to start, but it may not do the entire job.
- **Fuse replacement** — Some radio equipment may have a fuse mounted on the rear panel or wired under the chassis (or even in line with the power cord). Glass fuses, such as 3AGs, can show you that it's open. Sometimes a fuse fails randomly in equipment that is perfectly good, and it can be easily replaced.
- **A cold solder joint** — Occasionally, solder connections aren't made properly at the factory during the PCB wave-soldering operation. Sometimes these problems can be found by conducting a good visual inspection. If you don't see a clean solder connection on a pad, try holding the component wire with a pair of needle-nose pliers and wiggling it. If it moves, then you should re-solder that joint by heating it up and flowing new solder onto it. This is not uncommon, so it's something to look for.
- **A dirty contact** — Contact cleaner can be very useful when cleaning your radio. If one of your volume controls sounds scratchy when you turn it, use the thin plastic tube that came with the cleaner and spray

a small amount into the control, then rotate it a few times to spread the cleaner. Don't use too much — one short spray is enough. Similarly, if your band selector switch or other wafer switches are intermittent, or if some bands don't work at all, a small amount of spray will often clear up the problem. If your radio has circuit boards plugged into a mother-board, unplugging the smaller boards and using a little contact cleaner on the board contacts can do wonders for reliability.

- **A short between component leads** — Sometimes a good visual inspection can find a short between two or more component leads on or beneath a crowded chassis. Carefully move the leads around to ensure that there are no accidental shorts between them.
- **Electrolytic filter capacitor replacement** — A low-pitched hum coming from your radio is an indication that new power supply electrolytic filter capacitors are needed. Look for leaks from the larger electrolytic capacitors that filter your power supply. Electrolytics are polarized capacitors and will be marked with a plus and minus sign. These are chemical devices, and a leak or drips beneath the chassis indicate that they should be replaced. Sometimes it's difficult to find the right values, but two can be paralleled, if necessary. Make sure that the dc voltage rating is at least as high or higher than the old one. Today's electrolytic capacitors are often better and smaller than the old ones. Some hams automatically replace all the electrolytics (known as *re-capping*) when they acquire older radios, but I usually replace only the large power supply filter caps.
- **An open circuit** — Double-sided PCBs have through-holes. The pad on the component side of the board and the pad below it on the wiring side of the



Figure 1 — Sumner Weisman, W1VIV, replaced the cooling fan in his MFJ switching power supply.

board have a plated-through copper connection to attach the two circuits. Occasionally, the through-hole opens, resulting in an open circuit between the top and bottom of the board, sometimes due to a defect in manufacturing. You won't be able to see this via a visual inspection, but your ohmmeter can show it. If you find such a condition, simply apply a little solder to the pad at the top of the board. Because the bottom was already soldered, the component lead will now complete the circuit. If there is no component wire through the hole, add a short length of bus wire and solder it on both sides.

- **Replacing incandescent lights or LEDs** — If your indicator lamps aren't lighting up, it's usually a simple task to replace them. Light-emitting diodes (LEDs) are polarity sensitive, so look for the longer lead on the replacement device. That is the *anode*, or positive side. A flat on the base of the device indicates the *cathode*, or negative side, which is useful in case the leads have been cut shorter. There is usually a current-limiting resistor of a few hundred ohms in series with one side. It may be on the circuit board, but it's sometimes built into the case of an LED assembly.

Successful Repairs Are Worth the Effort

Once you gradually pick up some electronics knowledge, there's so much more you can do in the hobby. For example, you can use your voltmeter to check power supply voltages and use your ohmmeter to check signal diodes and power supply rectifiers, and to

Use Caution When Working with Electricity

Radio equipment contains potentially dangerous voltages. Someone without training in electrical safety should not open any device while it's connected to a power source. Unplug or disconnect the device and wait a few minutes for any charge to bleed off. Observe these cautions:

- Vacuum-tube linear amplifiers use plate voltages of up to several thousand volts. It's probably best not to work on these without experienced help.
- Any tube-operated equipment can use hundreds of volts, which can be life-threatening.
- Any device connected to the ac power line can be dangerous, especially if it has a two-prong plug (unless it uses double-insulated construction).
- Large capacitors in any device can hold a charge if discharge resistors are faulty.
- Internal batteries with high current capacity are dangerous if shorted, even if the device is off.
- Never bypass any fuses or safety interlocks.

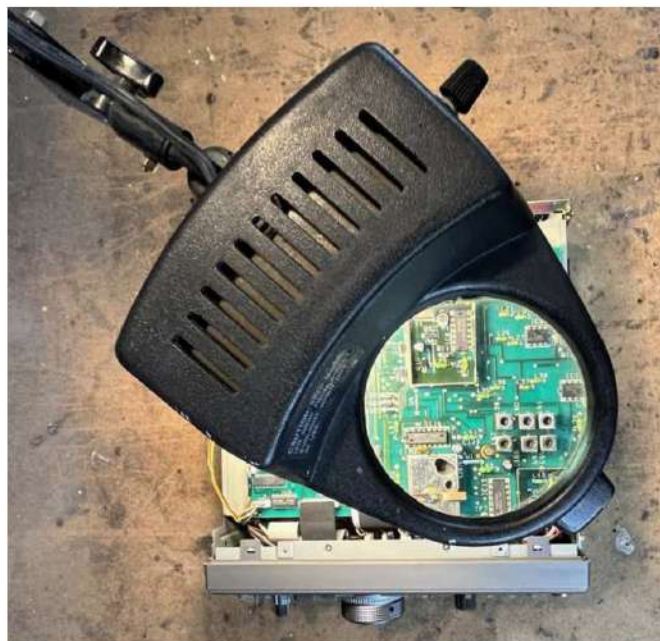


Figure 2 — An illuminated magnifier helps improve visual inspections.

see if resistors meet specifications or have drifted with time, or if capacitors are shorted.

If you can't find the problem, it may be time to step away before you break something or hurt yourself. If this happens, you have several options: Find a person with more skills, set the radio aside until you have acquired more skills, or consider replacing the radio and selling the old one. There's an active market for selling ham equipment on eBay for parts only.

It may be difficult to take your first step into making small non-technical repairs, but there are many reasons to try. I have repaired several transceivers and accessories with only a thorough visual inspection and careful repair. A fix of this sort, followed by successfully putting the radio back on the air, provides a wonderful feeling of ham radio accomplishment.

All photos provided by the author.

Sumner Weisman, W1VIV, holds an Amateur Extra-class license and has been a ham since 1952. He is a retired electronic engineer and has worked mostly in the electronic instrumentation field, including as engineering and national sales managers. Sumner has also been a communications technician in the US Navy, as well as a broadcast engineer and chief engineer at several AM radio stations. He held the FCC First Class Radiotelephone Operator license and was a Registered Professional Engineer. Sumner's favorite ham radio interest is CW contesting. He can be reached at w1viv.radio@gmail.com.

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Product Review

SharkRF M1KE Handheld WLAN IP Transceiver

Reviewed by John Leonardelli, VE3IPS

jleonardelli@arrl.net

The M1KE is a versatile digital transceiver developed by SharkRF, a company known for producing high-quality digital hotspot equipment. Pronounced *mike*, the M1KE combines the functionalities of traditional digital radios and hotspot devices into a single standalone unit. Unlike a typical RF hotspot, the M1KE is a fully standalone IP transceiver, offering advanced features and exceptional ease of use. While it requires a Wi-Fi connection to the internet, no RF radio device is needed.

SharkRF has been around for several years, starting with the first openSPOT, followed by the openSPOT2, 3, and 4. Their approach has been the same since the beginning, but they've enhanced their product with each version. The openSPOT4 Pro is the continuity of that line and was reviewed in the February 2025 issue of *QST*. All of the openSPOT versions include an RF module in the 70-centimeter ham band, and they require a digital radio in order to use it. The M1KE is the first of its kind and doesn't have any RF module in the ham band. It relies only on Wi-Fi and is a standalone product, so it doesn't require a digital radio. The M1KE and the openSPOT4 Pro share the same software and platform but operate differently, so in this review you will find many comparisons between them.

Multiple M1KE devices can also communicate directly without the need for a Wi-Fi network — or over an existing Wi-Fi network. They can essentially work as handheld transceivers in the 2.4 GHz band without any configuration required by the user. It also supports multicast communication for group communications on private networks and an ideal platform for experimentation. The new M17 digital protocol is currently not supported (M17 is an open-source digital radio protocol developed by amateur radio operators; see <https://m17project.org>).

By merging the capabilities of a digital transceiver and a hotspot, the M1KE eliminates the need for multiple devices, simplifying operations. Its compact form factor, built-in battery, and color display enhance portability, while the user-friendly interface ensures an intuitive experience for both beginners and experienced operators. The package includes a USB-C charging cable,



the unit itself, and a branded lanyard. The comprehensive manual is available online.

First Impressions

When I first saw the teaser advertisement after purchasing an openSPOT4 Pro, I was initially unsure of its purpose. However, after reviewing the manual, it became clear that the M1KE is an innovative product unlike anything seen before. Though it may resemble a toy, its internals are built on the latest digital radio technology. This small-format WLAN IP transceiver includes a speaker, microphone, and PTT switch on the left side, and on/off and menu buttons on the right side. A color display shows status and caller call signs. Everything felt solid, sturdy, and comfortable in my hand (see Figure 1). This is different!

Key Features

The SharkRF M1KE is designed for convenience and portability, featuring an integrated 3.7 V/2900 mAh polymer lithium-ion battery that provides extended operation, lasting several days without frequent

Bottom Line

The SharkRF M1KE is compact and lightweight, and it fits in the palm of your hand. Its sturdy plastic case ensures it can withstand daily use while providing reliable digital communication over a Wi-Fi gateway connected to the internet.



Figure 1 — The SharkRF M1KE in the author's hand.

recharging. It supports USB-C charging, allowing users to charge the device with a standard USB-C cable and a user-supplied power source. Unlike traditional digital transceivers, the M1KE offers standalone operation, eliminating the need for an external handheld radio. Instead, it relies on IP-based communication, connecting directly to digital mode servers over Wi-Fi or mobile hotspots without requiring an RF link. Advanced users can integrate the device with private IP-based networks and custom servers for enhanced control and flexibility.

The Standout Features

The features that stand out include:

- Micro-electromechanical systems (MEMS) microphone and speaker with DSP audio processing
- 750 mW loud audio output
- Sunlight-readable OLED display with brightness control
- Multicolor LED with adjustable brightness for real-time status monitoring
- Phone and desktop browser-compatible web interface for configuration and monitoring, including remote control and live display view with call audio playback
- Front-panel programming of all settings and features
- Fully automatic over-the-air firmware upgrades

For the manufacturer's specifications, see Table 1.

The SharkRF M1KE works out of the box without a computer or phone — no software, app, or drivers required.

M1KE vs. Different Hotspots

There are different types of digital mode hotspot devices:

1. Dongle-based hotspot — connects to a PC to access the internet, in some cases requiring no RF radio
2. RF hotspot — acts as a UHF repeater and connects to the internet via Wi-Fi (e.g., SharkRF openSPOT4 Pro)
3. IP transceiver — connects directly to the internet via Wi-Fi, eliminating the need for an RF radio and a computer (e.g., SharkRF M1KE)

One of my biggest gripes with the openSPOT4 Pro is its lack of an LCD display. The M1KE addresses both of these issues by incorporating a display and eliminating the need for an RF handheld radio or a computer. The openSPOT4 Pro requires an RF-based digital handheld to connect to the internet, whereas the M1KE integrates the speaker, microphone, and digital mode processing into a single device. The differences among the different devices are how they interact with the user and if a radio is needed or not.

Each device serves a unique purpose, and I've found all of them to be useful for my digital

Table 1 — SharkRF M1KE Handheld WLAN IP Transceiver

Manufacturer's Advertised Specifications (not tested in the ARRL Lab)

Dimensions:	96 × 66 × 25 millimeters (102 × 66 × 25 millimeters including the lanyard hole)
Weight:	136 grams
Operating temperature range:	Normal operation: -10°C to +45°C Battery charging: 0°C to +40°C
Battery:	3.7 V, 2900 mAh polymer lithium-ion Power supply: 5 V dc via USB-C port Recommended minimum power supply current: 1500 mA
Power consumption:	Maximum 1 A
Wi-Fi modem: Supported protocols:	IEEE 802.11b/g/n RF power output: 21.0 dBm (802.11b, 1 Mbps) Frequency range: 2.412 – 2.484 GHz
Receiver Wi-Fi sensitivity:	802.11b, 1 Mbps: -98.4 dBm 802.11g, 6 Mbps: -93.2 dBm 802.11n, HT20, MCS0: -92.6 dBm

mode communications and ongoing experimentation. However, they are not direct replacements for each other. It won't take long before you know which one is best for your situation.

Why I Got the M1KE

After upgrading my former hotspot to the openSPOT4 Pro, I was intrigued by the M1KE. My primary need was a simple mobile RF hotspot device with a built-in battery and support for all digital modes — without concerns about SD cards and software updates. The M1KE fits this requirement perfectly, as does the openSPOT4. It tucks neatly into my everyday carry bag, allowing digital mode access anywhere with a Wi-Fi internet connection. When using my cellular hotspot in the car, I no longer need to rely on a handheld transceiver. The crisp OLED display provides clear status information, the speaker is powerful, and the PTT has a satisfying feel. Audio reports have been excellent, and the device also integrates seamlessly with the SharkRF web interface, common across other SharkRF devices.

I realized after a few days of use that I continue to use my openSPOT4 and the M1KE — one has not replaced the other. I like the ability of my Icom handheld to monitor the D-STAR net and listen to my local repeater on the second VFO. You cannot do that with the M1KE.

How the M1KE Works

The M1KE connects to cellular hotspots or home/public Wi-Fi networks to access digital mode servers. For example, I can simply turn on the M1KE, it connects to my home Wi-Fi gateway and registers, and I am listening to D-STAR Reflector 030C. I use the side **PTT** button to join the conversation, just like using a regular handheld transceiver, but without needing an RF link.

I can use the menus and make front-panel programming changes or use the SharkRF Link app with a web browser to make changes and pull statistical information.

Keep in mind that even though the unit does not emit RF other than Wi-Fi, a valid amateur radio license is required to use it because reflectors (servers) are often connected to nodes or repeaters that can retransmit your communications over the amateur radio bands at the other end.

Quick Setup

First things first: Charge the device using a 5 V dc USB 2 A power cube. Before configuring anything, I updated the firmware to the latest V21 stable to ensure I had the latest features and bug fixes.

Getting on the air with D-STAR takes just minutes, assuming you're already registered with <https://radioid.net>. The initial setup is straightforward by simply following the on-screen instructions:

1. Select your country.
2. Choose your Wi-Fi network and enter the passkey.
3. Enter your call sign, which will trigger a DMR ID lookup.
4. Confirm your valid amateur radio license.
5. The device will connect to its server, check for software updates, and restart.

Once it reboots, it will search for the Wi-Fi gateway, log in, and default to broadcast mode — a license-free mode allowing M1KE-to-M1KE communication.

Now, let's do a quick setup for D-STAR so you can start listening to traffic while reading the manual. If you are already registered with a D-STAR gateway and have a DMR ID, you're good to go.

1. On the Quick Setup page, verify your call sign under Owner Information.

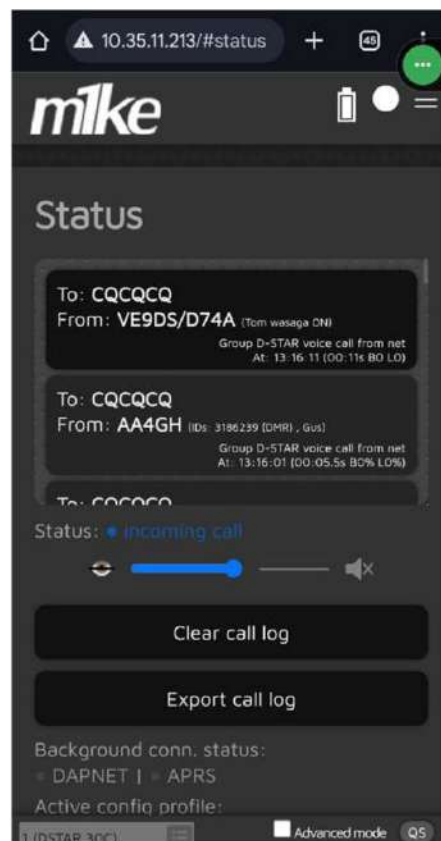


Figure 2 — The SharkRF Link app displays active call status.

2. Switch to the D-STAR/REF/XRF section.
3. Add REF001C (worldwide) as the selected reflector.
4. Save your settings, then use the **CONNECT MENU** to register with the D-STAR trust server. The device will confirm your connection with a female voice announcement.

You should now be hearing local traffic on REF001C while you explore the device's capabilities.

For easier programming, use the SharkRF web interface. Ensure your device and browser are on the exact same Wi-Fi network, then go to <https://www.sharkrf.link>. You'll need to enter the device UID, found on the label on the back of the unit. When the device is connected to your home network, you can also open the web interface by entering <http://m1ke.local> or <http://m1ke> or the device's IP address into the web browser (if your router doesn't support multicast DNS [mDNS]).

I recommend setting profile #1 as the default upon power-up — I have mine configured for D-STAR REF030C. You can store up to 10 profiles for quick switching between modes.

The SharkRF Link app displays active call status (see Figure 2), including the call sign and location of the user currently transmitting. It also features a bit error status indicator, which helps you monitor the impact of internet lag on audio quality. This makes it easy to identify any connectivity issues. It also has **SETTINGS** and **CONNECTOR** tabs available for easy programming, saving yourself a lot of time.

The **LOG** tab shows recent users on the selected reflector, while the **SWITCH** tab allows you to change the active reflector and configuration profile. The **SETTINGS** menu provides options to adjust microphone gain and gain settings, which I found useful to lower my loud radio voice.

The app's interface is clean and straightforward, with fast connectivity to get you operational quickly. This ease of use means that even new hams can make digital contacts without owning a dedicated digital radio.

Use Case 1: Home

I programmed my home Wi-Fi SSID and passkey, along with my mobile cellular hotspot credentials, so it connects automatically. It supports up to five network connections, allowing me to add locations like my local coffee shop and the city's public Wi-Fi gateway at the nearby park. There is a search function as well to locate Wi-Fi gateways.

When I turn on the M1KE it connects to profile #1 by default. Once set up, I was able to monitor traffic and respond to calls seamlessly while in the workshop, home office, or radio shack.

One night, I was building the ARRL End-Fed Half-Wave Antenna Kit and I turned on the M1KE. I heard Ivan, HL5BBD, in Busan, South Korea, signing off with another ham, and I called him. He reported that my audio was excellent, and he had many questions about the device. I walked around the house looking for signal dropouts and found none. The internal Wi-Fi antenna was doing its job. Using the front-panel menus, I moved to Reflector 001C and let Ivan continue his conversation on 030C. It was that simple!

Use Case 2: Portable

On walks to the dog park or the community hub, the M1KE allows me to simplify digital contacts using only the transceiver and my cell phone hotspot, leaving my Icom ID-51A and openSPOT4 Pro at home.

Because I bring my phone with me, all I need to do is grab the M1KE and go out the door. This simplifies my load out, but there are times when I use the openSPOT4

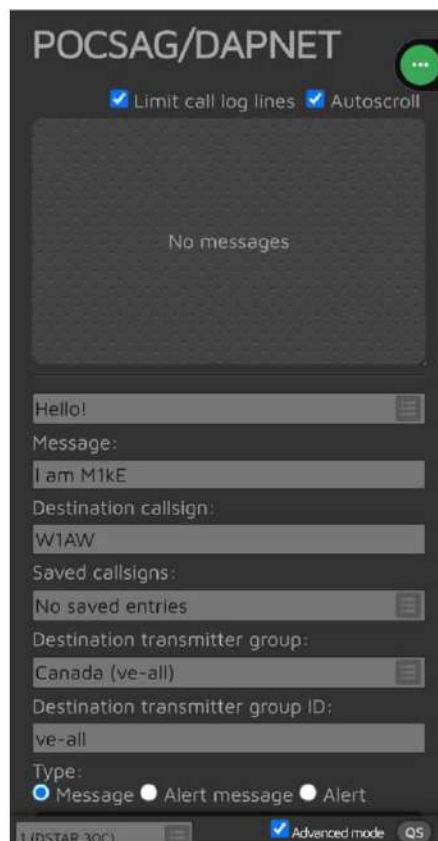


Figure 3 — The SharkRF Link app POCsAG/DAPNET screen.

Pro because I still need to have the handheld for local repeaters. The M1KE is digital modes only.

Use Case 3: Mobile

Previously, I used the openSPOT4 Pro in my car with my D-STAR mobile radio for digital contacts. Now, the M1KE streamlines mobile operations by removing the need for an RF radio altogether. The OLED display provides clear status updates, and the powerful built-in speaker and PTT button offer excellent usability. My mobile now monitors the local club repeaters while I chitchat on digital modes with the M1KE.

The device does offer a hand microphone experience, making mobile operation easy. Keep in mind that the M1KE may not be considered a two-way radio by your local authority, and it may be illegal to use it while driving in certain regions, as it doesn't support hands-free operations. You should always double-check your local regulations before using it while on the move.

Use Case 4: Digital Mode Experimentation

The M1KE supports APRS Chat, allowing users to send and receive messages, as well as transmit location data. It can also communicate directly with other M1KE devices without an internet connection, potentially serving as a low-cost messaging system.

The M1KE supports POCSAG messaging through integration with Decentralized Amateur Paging Network (DAPNET; see Figure 3 for the POCSAG/DAPNET screen). This allows users to receive pager-style messages directly on the device through the web browser app. This is another area of the hobby to

explore, and I look forward to sending messages to my DAPNET friends.

If several members in our club have M1KEs, then we could communicate with each other over the Field Day Wi-Fi network using its point-to-point multicasting capabilities (or even on a mesh network) that could prove interesting.

The manual has a lot of information, and I look forward to experimentation and more IP-based ham radio devices and information from early adopters.

Final Thoughts

After a week of use, I found the battery life to be excellent, lasting longer than my Icom 51A handheld. I was getting several days of use. I could easily charge it with a 5 V 18 W adapter, which was faster than trying that with my handheld. I just had to get used to the fact that the belt clip is not an option on the M1KE, but it works wonderfully with the included lanyard.

For some users, having a dedicated device like the M1KE will satisfy all their operating needs; for others, adding a M1KE to their digital shack will reward them with an interesting and versatile way to make contacts.

The SharkRF M1KE is an innovative and practical addition to my digital radio setup. It simplifies operations, reduces equipment clutter, and offers an intuitive user experience. Whether at home, on the move, or experimenting with digital modes, the M1KE has proven to be a valuable tool in my digital communications tool kit that I reach for more often than not.

Manufacturer: SharkRF OÜ, Lootsi 8, Tallinn, 10151, Estonia, www.sharkrf.com. Price: Approximately \$400.

Palstar AMU-1K Automatic Antenna Tuning Network

Reviewed by Phil Salas, AD5X
ad5x@arrl.net

The Palstar AT-Auto 1500 W automatic antenna tuner has been around for many years, and it was reviewed in the August 2006 issue of *QST*. That auto-tuner uses a continuously tunable variable capacitor and inductor. The new Palstar AMU-1K uses the more common

Bottom Line

The Palstar AMU-1K auto-tuner provides fast matching solutions for less-than-perfect antenna systems for transmit power up to 1000 W SSB and CW. For digital modes, the power should be reduced to 500 W or less.



relay-switched fixed capacitors and inductors we see in most auto-tuners today.

Overview

The AMU-1K is rated for 1000 W RF power from 1.8 – 30 MHz. It is a low-loss reversible L network, which uses dual-relay switching for tuning solutions where high RF voltages can occur. A unique feature of the AMU-1K is an internal high-power 50 Ω attenuator that can be automatically switched in-line during tuning. This ensures that your transmitter sees a low SWR during the auto-tuning process. And most of the transmit signal is attenuated during the short tuning cycle. The AMU-1K can be set to tune automatically or manually. And it can be set for RF sensing or PTT sensing. If PTT sensing is used, the PTT output to the amplifier can be interrupted when auto-tuning is in process or if an antenna fault occurs. Tuning solutions are automatically stored in memory based on the AMU-1K internal frequency counter. Memory recall occurs in typically 250 ms. And finally, the AMU-1K has three selectable antenna output ports. The AMU-1K comes with a pretty minimal manual and a 12 V dc 1.5 A power module. You can power the AMU-1K from your station 13.8 V dc power supply, but you will need to supply your own cable terminated with a 5.5 x

2.5-millimeter plug. I couldn't find any detailed specifications online; however, I was able to determine some of the Table 2 specifications by talking to the hardware designer.

Physical Description

The front panel of the AMU-1K (see the lead photo) consists of a power button and a 3.5-inch touchscreen display. The rear panel (see Figure 4) has the SO-239 RF ports (one input and three output ports), the PTT/amplifier interrupt RCA jacks, a programming-enable button, a USB-B port for firmware updates, a DB9 connector for remote control, and a dc power jack.

Of course, I had to look inside (see Figure 5). There is one air-wound inductor and six toroid inductors. The high-voltage surface-mount device capacitors are to the left of the inductors, and across the bottom just over the relays.

Operational Description

The relays are non-latching, so when the AMU-1K is powered off, it reverts to bypass. When power is applied, the front-panel display will momentarily show the firmware version and then switch to the normal operating screen (Figure 6). This screen shows the last frequency used, a bar graph power display, a digital SWR indication, whether tuning is manual or automatic, and the antenna port selected. Across the bottom of the display are the soft buttons **MENU**, **ANT**, **MODE**, and **MANUAL**. Tapping **ANT** takes you to a screen that lets you select the desired RF output port. Tapping **MODE** permits selecting the automatic tuning mode or tuner bypass for specified frequencies. Tapping **MANUAL** lets you adjust the AMU-1K's L-C values yourself, in case you want to try to tweak the tuning result.

Tapping **MENU** brings up a number of different screens that permit customizing various parameters. These include the following:

- SWR matching level: 1.3:1 – 2:1, 1.5:1 default
- RF (default) or PTT sensing
- Auto store: replace stored value always, or only if it is better than previous (default)
- Match status: keep (default) or drop match after transmit
- Manual tuning: full control (default) or fine-tuning only
- SWR test delay: 0 – 20 ms, 10 ms default
- Rematch delay: 0 – 2000 ms, 1000 ms default
- Power-up mode: manual, auto (default), or last used
- Power bar graph scale: 120 W, 600 W, or 1200 W (default)



Figure 4 — The Palstar AMU-1K rear panel.

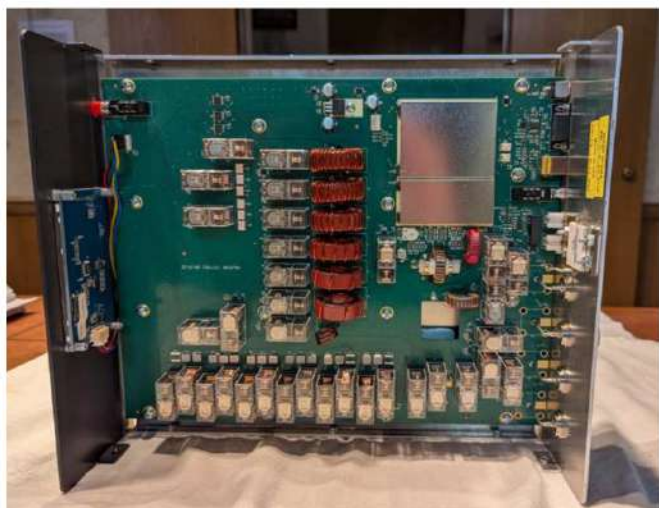


Figure 5 — Internal view of the Palstar AMU-1K.

- Antenna 1/2/3 memory initialization: erases stored settings on a per-port basis
- Input pad: enabled (default) 1000 W matching maximum power, or disabled 130 W matching maximum power
- Output antenna port: auto (default) or manual for each ham band
- Matching time out: disable (never) or 5 – 30 minutes
- Backlight intensity: high (default) or low

Basic Testing

I performed the tests using the standard ARRL resistive load and loss testing, and the results are shown in Table

Table 2 — Palstar AMU-1K Automatic Antenna Tuning Network (Firmware V1.33)

Author's Determined Specifications (not tested in the ARRL Lab)

Frequency coverage:	1.8 – 30 MHz
Power:	SSB/CW 1000 W FM/digital 500 W AM 250 W
Inductance range:	0.2 – 25.6 μ H (0.2 μ H steps)
Capacitance range:	26 – 999 pF (typically in 10 – 20 pF steps)
Number of memories:	Not specified
SWR resistive matching range:	Not specified (see Table 3)
Attenuator:	Approximately 9 dB
Maximum tuning power:	130 W without attenuator, 1000 W with attenuator
Minimum tuning power:	5 W without attenuator, 10 W with attenuator
Digital SWR meter:	9.9:1 maximum display
Bar graph power meter:	120 W, 600 W (default), 1200 W
RF ports (SO-239):	RF input and three antenna ports
PTT/amplifier bypass:	RCA jacks
dc power:	11 – 14 V dc @ 1.8 A maximum
dc connection:	5.5 $\times$ 2.5 millimeters
Dimensions (width, height, depth):	11 $\times$ 4.5 $\times$ 14 inches



Figure 6 — The Palstar AMU-1K normal operating screen.

3. Tuning took less than 5 seconds when a solution could be found. NT means there was no tuning solution. When a solution could not be found, the AMU-1K bypasses itself. Measurements were made with a 3% NIST-traceable power meter. There is no specification on SWR matching range.

Next, I tested the AMU-1K into open and short terminations. If an antenna tuner can match into an open or short, that means it is matching into its own internal losses. No matches were found on any band, which implies low internal losses.

My final tests were made at 500 W with my 43-foot vertical. I used the PTT/amplifier bypass inputs, as I always want my amplifier off-line during tuning, or in case of an antenna system fault. My 43-foot vertical is fed through 60 feet of FSJ4-50B ½-inch HELIAX®. Figure 7 is an SWR plot of the antenna as seen at the AMU-1K output.

The AMU-1K easily tuned the antenna on 60 – 10 meters. Initial tuning on these bands occurred in 2 – 5 seconds. Returning to a pre-tuned frequency resulted in the tuner jumping to the prior solution in a fraction of a second. The AMU-1K was unable to tune the 43-foot vertical on 160 and 80 meters. This is not unexpected, as the 43-foot vertical is highly capacitive reactive on these bands.

Firmware Updates and Remote Control

At the time of this review, the ability to update firmware is not available, as there are no update instructions and the AMU-1K

Table 3 — Palstar AMU-1K Resistive Load and Loss Testing

Frequency	Output Z Measured	Impedance Measured					
Untuned	Load	Power Loss (%) and Tuned SWR by Band (meters)					
SWR	(Ω)	160 M	80 M	40 M	20 M	10 M	
10:1	5.0	NT	NT	9%	<3%	<3%	
Tuned SWR		-	-	1.5:1	1.3:1	1.5:1	
8:1	6.25	NT	NT	5%	<3%	<3%	
Tuned SWR		-	-	1.2:1	1.1:1	1.4:1	
4:1	12.5	4%	4%	<3%	<3%	10%	
Tuned SWR		1:1	1.1:1	1:1	1.1:1	1.3:1	
2:0	25	4%	4%	<3%	<3%	6%	
Tuned SWR		1.1:1	1.1:1	1:1	1.1:1	1.1:1	
1:1	50	0%	0%	0%	0%	<3%	
Tuned SWR		1.2:1	1:1	1:1	1.1:1	1.2:1	
2:1	100	6%	<3%	<3%	<3%	8%	
Tuned SWR		1.5:1	1:1	1.1:1	1.1:1	1.5:1	
4:1	200	NT	4%	4%	4%	NT	
Tuned SWR		-	1.5:1	1.1:1	1.1:1	-	
8:1	400	NT	NT	7%	8%	NT	
Tuned SWR		-	-	1.1:1	1:1	-	
10:1	500	NT	NT	8%	NT	NT	
Tuned SWR		-	-	1.3:1	-	-	

firmware is not listed on the Palstar website. The product is not even listed on the manufacturer's website, but it's available through different distributors. A USB-B programming cable is not included with the AMU-1K. The remote-control input is also not currently supported. When available, I assume this will permit band and frequency control from your transceiver.

Wrap-Up

The AMU-1K is an effective 1000 W CW and SSB auto-tuner. It is solidly built and tunes fast. Not only does the

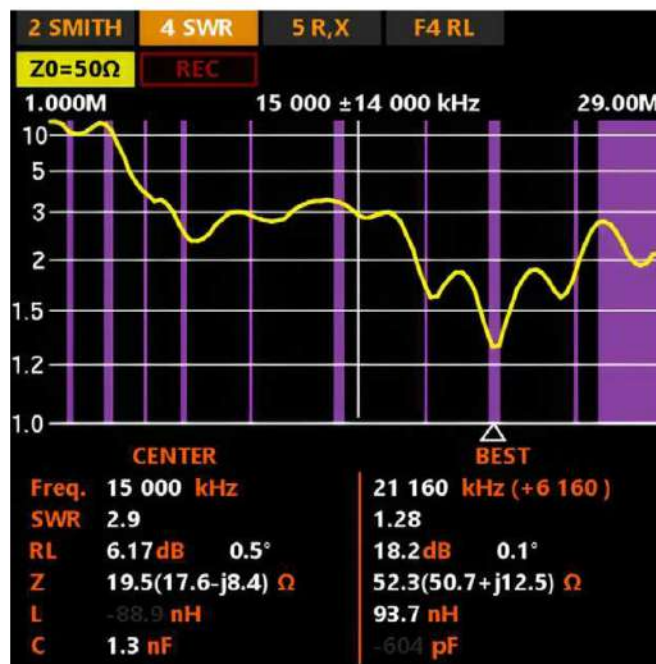


Figure 7 — The SWR plot of the author's 43-foot vertical antenna as seen at the AMU-1K output.

internal attenuator provide a good SWR to your transceiver during tuning, but you don't have to reduce your RF drive when tuning. The large touchscreen display is also a nice feature. Hopefully we will see remote-control capability in the near future, though the AMU-1K works quite well using PTT and RF sensing.

Manufacturer: Palstar Inc., 9676 Looney Rd., Piqua, OH 45356, www.palstar.com. Price: \$1,549.95 (price may vary by distributor).

Halibut Electronics EggNOGS Antenna

Reviewed by John Leonardelli, VE3IPS
jleonardelli@arrl.net

AMSAT, SatNOGS, and TinyGS continue to launch new satellites for amateur radio use. The International Space Station (ISS) also provides valuable STEM experiences, allowing students to engage in conversations with astronauts. For amateur radio enthusiasts who want to experiment with satellite reception without making a significant investment in antennas, rotators, and tracking systems, the EggNOGS antenna kit is an excellent option.

I wanted to spend more time this year experimenting with the reception of various satellites and their antennas, but some of the designs in the ARRL QST index seemed to me too difficult to build.

Bottom Line

If you are just starting out listening to satellites, then the Halibut Electronics EggNOGS antenna is a very good choice for the experimenter.



I own several satellite Yagi antennas, and they require one to “stand outside and wave the antenna around,” but for dedicated listening I found a mobile magnetic-mount antenna held onto a pizza pan to be a very poor choice, as signals were not what I expected. I really wanted a commercial eggbeater-style antenna, but the pricing was out of my range, until I came across the EggNOGS kit and placed an order. This is a cost-effective antenna solution that is a solid choice for improved reception and a basis for further experimentation.

The Halibut Electronics EggNOGS kit simplifies the construction of eggbeater antennas, which are good for satellite communications due to their omnidirectional, hemispherical radiation pattern, achieved through unique phasing methods and antenna elements. While it’s possible to scratch-build this project, doing so requires significant time and effort to source and fabricate the necessary parts. Personally, I’d rather spend my time in front of the radio than hunting for components and drilling holes into PVC top caps properly. Thankfully, Halibut Electronics handles all the critical work, allowing me to easily assemble a professional-looking antenna. This also saves time if troubleshooting is needed, as the provided instructions are comprehensive and ensure a successful build.



Figure 8 — The SatNOGS dashboard.

Add an SDR receiver and a Raspberry Pi, and you’ll be equipped to monitor SatNOGS satellite data and receive signals with a modest investment. Long-range (LoRa) packet devices are also being used for ham communications.

Use a portable handheld or a portable radio like the Yaesu FT-818, Icom IC-705, or an SDR dongle for easy listening.

Design

The eggbeater antenna is a unique design that allows for consistent satellite reception without the need for a rotator system to track moving satellites. It is an omnidirectional, circularly polarized antenna specifically designed for satellite communications, particularly with low Earth orbit satellites. The antenna consists of two horizontally polarized full-wave loops mounted at right angles to each other and coupled together, 90 degrees out of phase. The eggbeater is an improved version of the turnstile antenna. At the horizon, the polarization is linear and horizontal, but as the satellite’s elevation increases, the polarization becomes more circular, in proportion to the elevation. This aligns with the polarization of the satellite’s transmit signal. I can set up the antenna outside and not worry about having to rotate it during satellite passes.

I chose the VHF and UHF versions of the Halibut EggNOGS with BNC connectors. Please note that there are several options on the Halibut website.

For unattended operation, the eggbeater is ideal. Simple testing has shown it to perform better than a dipole and a discone antenna. While a Yagi antenna is another option, it requires careful tracking to ensure it’s pointed at the satellite during passes. It can be automated with a tracking program and az/el rotators, but that setup is costly and typically beyond the budget of the casual experimenter.

I have a spare scanner radio that I plan to dedicate to monitoring the ISS on 145.800 MHz using the VHF antenna and recording SSTV image passes in an unattended fashion. The UHF antenna will be used for a SatNOGS ground station.

Ham Radio Satellites for Experimentation

Amateur radio operators have access to a variety of satellites for experimentation across the different bands.

Ham radio satellites are specifically designed for amateur radio use. They facilitate voice communication and data transmission among operators worldwide. Notable examples include the original Orbiting Satellite Carrying Amateur Radio (OSCAR) series, AO-73

CubeSAT, packet satellites, NOAA, and even recent Fram2Ham (sending SSTV images).

We have hobby-based satellites operating in these frequency bands:

- 137.5 MHz: NOAA weather satellites
- 145.9 MHz: amateur radio 2-meter band
- 360.0 MHz: commercial satellites
- 388.0 MHz: commercial satellites
- 401.0 MHz: commercial satellites
- 433.5 MHz: ISM-band TinyGS LoRa
- 436.5 MHz: amateur radio 70-centimeter band

SatNOGS is an initiative of the Libre Space Foundation, a nonprofit organization dedicated to advancing open-source space technologies. It is widely used by schools, researchers, and space agencies to track CubeSats, study radio propagation, and monitor space weather.

The SatNOGS network is made up of ground stations deployed around the world. A centralized scheduling platform allows users to request satellite passes through the SatNOGS web interface (see Figure 8 for the SatNOGS dashboard; <https://dashboard.satnogs.org>). When a satellite comes within range of a participating ground station, the system records and decodes the signal, and the collected data is shared publicly for collaborative analysis.

The TinyGS is another open-source network using LoRa packet devices.

By integrating an eggbeater antenna into a SatNOGS ground station, operators can efficiently monitor satellite signals without the complexity of a directional antenna system.

What Comes with EggNOGS?

The kit comes with all the unique parts that you can't get at the local hardware store:

- Circuit boards, including the band-specific phasing board
- Pre-drilled 2-inch/50-millimeter PVC cap
- Common-mode current choke: RG-316 and BN-43-3312 ferrite core
- Feed-point RF connector (SMA by default; BNC and type-F are available)
- Stainless-steel hardware

The builder provides the following, all available from your local hardware store:

- A section of 2-inch/50-millimeter schedule 40 PVC pipe as a mast

- Material for the aerial loops and ground plane (I used #14-gauge solid core copper wire)

Kit Assembly Complexity

The EggNOGS kit is thoughtfully designed to be user-friendly, even for those with limited antenna-building experience. It simplifies the complex task of creating the 90-degree phase shift between the antenna's loops by providing a specialized printed circuit board (PCB), eliminating the need for hard-to-find 100 Ω balanced shielded feed lines. Comprehensive assembly instructions are included, guiding users through each step of the building process.

The kit is easy to assemble using simple hand tools and a low-wattage soldering iron. I read through the instructions several times and highlighted key assembly points for reference. While the kit is simple overall, its mechanical nature requires careful attention to certain steps to avoid fitting issues. A crucial part of the building is aligning the two PCBs properly to ensure they fit into the PVC cap. I recommend performing several trial runs before final soldering to ensure a perfect fit.

I was able to build both units in about an hour, plus additional time to build the wire elements. I found the build to be straightforward. There are only four soldering joints



Figure 9 — The author's EggNOGS antenna installation.

that affect signal reception, and it's very hard to get that wrong.

I built the square element design using #14-gauge wire. While this gauge works well for the UHF version, I found the VHF version — with its 2-foot sides — a bit too flexible. For increased stiffness, I recommend using #12-gauge wire instead. To help support the structure, I used a tie wrap to hold the top elements together, which offered some improvement. However, for a more rigid build, I plan to switch to aluminum bars or a stiffer wire in future versions. My installation is shown in Figure 9.

Do not use the locking nuts until you are completely satisfied. The kit includes regular nuts to allow temporary installation of the wires.

To create a lighter setup, I used PVC reducers to adapt a 1½-inch mast in place of the original 2-inch design. I mounted the assembly on a T-bar for use with my antenna tripod. I also drilled a ¼-inch hole in the end caps to accommodate the mast. During assembly, I realized an additional exit hole is needed for the coaxial cable. Be sure to secure the lead-in cable by taping it along the mast — any strong tug on the coax could place undue strain on the EggNOGS PCB, potentially causing damage.

I was hearing the AO-73 satellite, which offers SSB contacts, very weak on my Yaesu FT-818 and whip antenna. With the EggNOGS I was listening with great signals to hams frantically making grid square contacts during the satellite pass.

With 25 feet of RG-316 coaxial cable with SMA connectors, I tried reception using my SDRplay and FUNcube (AO-73), observing waterfalls for signals and watching the Doppler shift. The waterfall also gave some indication of filter performance.

The antenna is also useful for repeater monitoring to a dedicated scanner radio. I set up a quick channel bank with some satellite downlink frequencies including the ISS, APRS channel, a local VHF repeater, a simplex channel, and even Marine 16 to scan for fun, and it worked out very well.

I see a portable setup for on-site STEM classes where users can set up the antenna and run the cable back to their SDR receiver for reception of signals. A local scouter mentioned strong interest in setting up a satellite workshop for the upcoming Jamboree on the Air event.

Transmit Capability

EggNOGS can handle a moderate amount of transmit power. The upper limit is still being determined, but

it's somewhere between 15 and 50 W. It can definitely handle 5 to 10 W without problems. I tried it using 10 W.

Remember, each satellite usually has a downlink and uplink frequency, and they are usually in separate bands. You may need separate VHF and UHF eggbeater antennas if you plan to transmit. Also, with the addition of preamplifiers, filter modules, and bias tee injectors, the transmit capability needs to be understood to avoid damage to the preamplifier or radio. *The ARRL Handbook for Radio Communications* has an excellent section on satellite communications.

Filters — Essential Components for Ground Stations

Band-pass and high-pass filters are essential components for deploying a reliable ground station. Over the years, radio frequency interference, electromagnetic interference, and general electrical noise have increased significantly, disrupting radio communications across all frequency bands. While interference is often linked to HF bands, it can also present a major issue above 30 MHz, affecting VHF and UHF operations if you are using a wide-band receiver, like an SDR that has no pre-selection.

Cellular towers and other high-power transmitters also contribute to front-end overload, particularly in wideband SDRs that lack proper pre-selection. To address this gap, Halibut developed a high-performance filter specifically for VHF/UHF frequencies.

AM BCI Filter for VHF/UHF

The AM BCI filter for VHF/UHF is an in-line receive filter that blocks the AM broadcast band from overloading your receiver's front end (better than -60 dB), while allowing VHF and UHF to pass through with minimal insertion loss (-0.1 dB over VHF, 1 dB over UHF). This can prove to be an effective solution to lower the noise floor for better signal reception, as well as to avoid receiver de-sensing that degrades signal reception.

AM-FM BCI Filter

The AM-FM BCI filter blocks both the AM and FM broadcast bands. It's a more complex high-pass filter, with better than -35 dB below 108 MHz, with <1 dB insertion above 140 MHz, and <0.2 dB insertion loss from 280 MHz up to 3 GHz.

AM-FM-Cell BCI Filter

This band-pass filter passes signals between 137 and 450 MHz with a 1 dB ripple and blocks everything below 108 MHz and above 550 MHz by >35 dB, effectively blocking both the AM and FM broadcast bands, and the cellular bands above 450 MHz.

AmpNOGS (Future)

AmpNOGS is an in-line transmit-capable low-noise amplifier for use with EggNOGS (or any antenna).

TeaNOGS (Future)

TeaNOGS is a bias tee injector with transmit control for AmpNOGS. I understand this will be compliant with the SDRplay series of SDR receivers offering a bias tee voltage.

Conclusion

The EggNOGS kit from Halibut Electronics provides a practical and accessible solution for amateur radio operators looking to build an effective satellite communication antenna. Its user-friendly design, combined with the benefits of eggbeater-style antennas, makes it a useful addition to any ham radio setup for those interested in satellite reception.

As part of my testing, I evaluated the included filters using an SDRplay receiver to observe bandwidth sweep characteristics. They performed exactly as intended, effectively reducing noise and improving the signal-to-noise ratio. I even conducted transmission tests on 6 meters and 1.2 GHz to assess any potential interference, and the filters handled these scenarios well. Their utility extends beyond the EggNOGS project — scanner enthusiasts and those monitoring Starlink or Iridium

satellites in the GHz range may also benefit, especially in environments with high RF interference.

Initially, I opted for BNC connectors, thinking they would better suit handhelds or scanning receivers. However, shortly after soldering them in place, I realized that SMA connectors might have been the more versatile choice, particularly because the filters and most SDR receivers use SMA.

Overall, the portability and performance of this setup show great promise. Whether I decide to build a permanent SatNOGS ground station, dedicate a scanner to ISS reception, or simply tune for satellites using a handheld, the EggNOGS antenna enhances my satellite listening experience and opens up plenty of room for experimentation.

In summary, the Halibut Electronics EggNOGS kit offers a practical solution for enthusiasts aiming to construct a satellite communication antenna. Its user-centric design, coupled with the inherent advantages of eggbeater antennas, makes it a suitable addition to any amateur radio setup.

Manufacturer: Halibut Electronics, **www.electronics.halibut.com**. Price: \$79 with SMA (default); add an extra \$10 for BNC or type-F.

Write for QST

QST looks for material that appeals to a broad cross-section of readers within the diverse amateur radio community. Feature articles published in QST fall into one of two broad categories: technical and general interest.

Technical articles outline a construction project or a technical concept. General interest articles are “everything else”: recaps of DXpeditions, grid expeditions, or public service activities, or personal accounts of trying a new mode or style of operating — anything relating to operating or the ham radio avocation.

Regardless of your manuscript's topic, a strong “how-to” component will make it stand out.

General interest submissions should be 1,200 – 1,800 words with 3 – 5 high-resolution images. Technical article submissions may be longer and include more images as the subject matter requires (for example, step-by-step instructions for a project). Please submit images as separate attachments, and include captions for all images at the end of your manuscript. Send manuscript materials to **qst@arri.org**.

For even more information, see our Author Guide at **www.arri.org/qst-author-guide**.

Ask Dave

Get more information from the “QST: Ask Dave” YouTube playlist at <https://bit.ly/3z2MBMI>.

Antennas and Grounds

Trouble Tuning an EFHW Antenna

Q Craig Sears, KQ4SID, asks: My HF radio is an old Yaesu FT-840 and an MFJ-949 tuner. I have 50 feet of Times Microwave LMR-400 coaxial cable going to the end-fed half-wave (EFHW) antenna about 25 feet up. I can't tune 10 or 15 meters. Sometimes, 17 and 12 work. Twenty meters tunes well without the tuner, 40 meters is more than 2:1 without the tuner, and 80 meters provides narrow bandwidth, which can be moved up and down the band by adjusting the tuner. How can I make this less complicated?

A I suspect the problem lies with the coax. No, the coax isn't bad, but the outside of the shield is serving as a counterpoise to the EFHW antenna. If that coax is connected directly to the tuner, all the common-mode current on the outside of the shield is playing havoc with your tuning.

An EFHW antenna should be close to resonance on all the bands it was built for, but trying to tune a 40-meter EFHW on 80 meters will be an exercise in frustration. The tuner should be for touch-ups for the bands the manufacturer claims for its antenna. The ARRL Store sells an EFHW kit that covers 40, 20, 15, and 10 meters (<https://home.arrl.org/action/Store/Product-Details/productId/133267>). If you extend the wire element to cover the bottom of the 80-meter band (add another 60 feet or so to the antenna), you can pick up FT8 on 80 meters and get good results on 30, 17, and 12 meters.

The solution to your tuning problem is to get rid of the common-mode current. Bring the coax down to a lightning arrestor that is firmly mounted to a standard ground rod right outside your station window. That gives a place for those common-mode currents to go. Then, bring the cable from the other side of the lightning arrestor into your station.

All the usual caveats about grounding apply. Your rig and tuner should also be grounded to that ground rod. Check H. Ward Silver's, NØAX, *Grounding and Bonding for the Radio Amateur, 2nd Edition*, available from the ARRL Store (<https://home.arrl.org/action/Store/Product-Details/productId/133989>), for the current best practices regarding grounding.

Ground Rods and Bonding Wires

Q John Martin, KB5GGO, asks: In bonding my tower ground rod to the station ground rod to the utility ground rod, I know I need to use AWG #6 bare wire. How deep must it be buried? Also, my ground rods are old. Do I need to clean them down to copper before connecting the bonding wires?

A I commend you for your careful attention to grounding. As mentioned earlier, the current best practices are found in the second edition of *Grounding and Bonding for the Radio Amateur*. The bonding wires should indeed be buried, but I can't find anything that specifies how deep. The point of burying is twofold. First, the bare underground wire adds to the effectiveness of the overall grounding system. Second, burying the wire helps protect it from accidental damage. I would say that 6 inches should be sufficient.

Regarding the ground rods themselves, note that most ground rods are copper-coated steel. Any abrasive cleaning of the part where you will connect the bonding wires should be avoided — just use a wet cloth. Note that the tightening of the crimp connection will cut through any oxide on the copper (copper turns green with extended air exposure).

Don't solder anything in your grounding system. If large currents flow, even if only the short period of a nearby lightning strike, the high current will flash-boil the solder. It can splatter pretty much anywhere. However, welding copper wires to copper ground rods is possible with TIG welding or the use of one-shot exothermic weld devices. If you are not comfortable doing these yourself, seek the help of a licensed electrician.

Mobile HF Antenna for Home Use

Q Ed Avila, K6SDW, asks: What do you think of using an HF screwdriver antenna, meant for mobile use, in a semi-permanent installation at my home? I currently use a Buddistick. It works well with radials, but when I want to change bands, I have to go outside and change taps on the coil.

A Yes, your idea will work. The screwdriver antenna is designed to use the chassis of your automobile as its counterpoise, so to work in your backyard you



Figure 1 — From *The ARRL Handbook*, Figure 21.72: The screwdriver-style remotely-controlled whip antenna. A small motor in the base mast moves a coil past contacts at the top of the metal base section. The top whip section is attached to the top of the coil. As the coil moves out of the mast, more inductance is connected in a series between the base section and top section. Screwdriver antennas are popular because they offer multiband coverage. [Joel Hallas, W1ZR, photo]

will need to add some radials. A screwdriver antenna is a whip atop a threaded rod. A motor turns the rod to lengthen or shorten the loading coil (see Figure 1). The controller for such an antenna can be as simple as a box that can cause the motor to run in either direction. More expensive controllers can automatically tune the antenna to resonance at the frequency it reads from the radio.

Because of the extensive loading, the antenna will be quite narrow-banded, so you may have to retune it

when changing frequencies, even in the same band. If you already have all the parts of the screwdriver antenna system, you can certainly put it in your backyard; however, if you are going to acquire the antenna and the remote controller, it can be quite expensive. For the same price, you have many options available.

For less than \$100, you can get the ARRL EFHW kit (mentioned earlier), which covers the 40-, 20-, 15-, and 10-meter bands with a wire about 60 feet long — and, if you have the space, adding another 60 feet of wire will add 80, 30, 17, and 12 meters. Note that the wire doesn't have to be in a straight line but can be zigzagged back and forth. There are also multiband verticals available from various outlets. Or, if you have some wire laying around, you can easily construct a multiband (fan) inverted V, as shown in the “Ask Dave” supplemental video from October 2023 (<https://youtu.be/HtL8bjSreul>). I constructed that antenna from some spare wire and a few pieces of plastic pipe to use as insulators, and its performance is excellent!

Unless you install a directional antenna, such as a hexbeam or a Yagi, the various antennas mentioned so far have about the same gain as a dipole. In fact, many expensive vertical antennas provide no more gain than a simple dipole. If you have the space, a simple fan dipole can be put up for very low cost.

Splitting Power Between Two Antennas

Q Roy Hopkins, ZL1RJH, asks: Can I use two Yagi VHF or UHF antennas on the same band so I can receive and transmit to different repeaters in different directions (one at a time) from my home?

A Yes, you can. The easiest way is with a remote antenna switch, of which there are many available. Another option is to use a power divider to feed both antennas at the same time. These will divide your radio's power output between the antennas and combine the received RF. If you would like to monitor repeaters in both directions, I recommend the latter.

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.

Hints & Hacks

Modifying a Stand for Portable Test Gear; Tracking Down Interference

An Affordable Bench Stand for Small Equipment

The proliferation of small, inexpensive vector network and spectrum analyzers, such as the NanoVNA and tinySA Ultra, allows any ham to use these portable devices to test antenna systems and hunt for interference. They have also become sophisticated enough to be used as bench test equipment. However, they must lay flat when being used at the workbench, making it difficult to attach interconnecting coaxial cables to devices under test.

While poking around online one day, I found an inexpensive cell phone stand for less than \$20, and I thought it might solve this problem (see Figure 1). The bodies of the NanoVNA and tinySA Ultra cases are thicker than the cell phones the stands were originally intended to hold, so I needed to modify the tabs at the bottom (see Figure 2). By carefully bending the front tabs using a bench vise, I created a flat surface that the devices could rest on (see Figure 3). This modification allows the stand to hold the device more securely at the bottom, but this alone doesn't provide a sufficient gripping surface. So, I hot-glued small pieces of drawer



Figure 1 — You can easily repurpose a \$20 cell phone stand to serve as a support for test equipment. [Dino Papas, KLØS, photo]

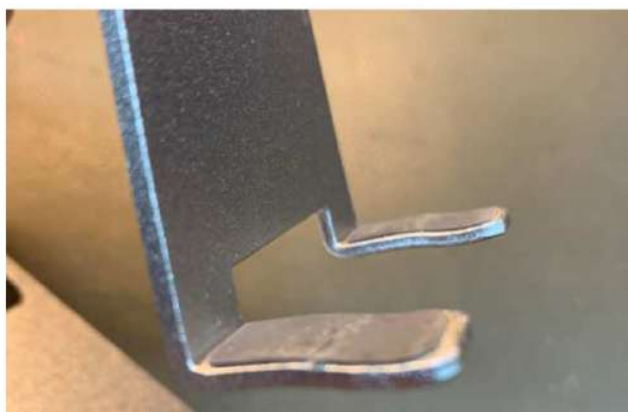


Figure 3 — A close-up view of the bent tabs. [Dino Papas, KLØS, photo]

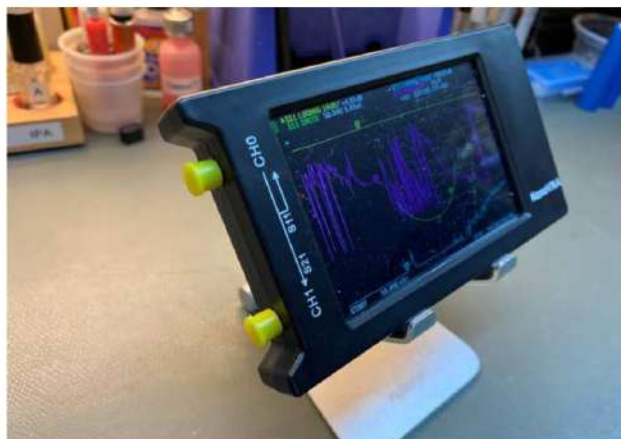


Figure 2 — The tabs of the existing stand needed some modification to hold the device. A NanoVNA is shown here. [Dino Papas, KLØS, photo]



Figure 4 — Glue small pieces of drawer liner material to the stand to provide additional support. [Dino Papas, KLØS, photo]

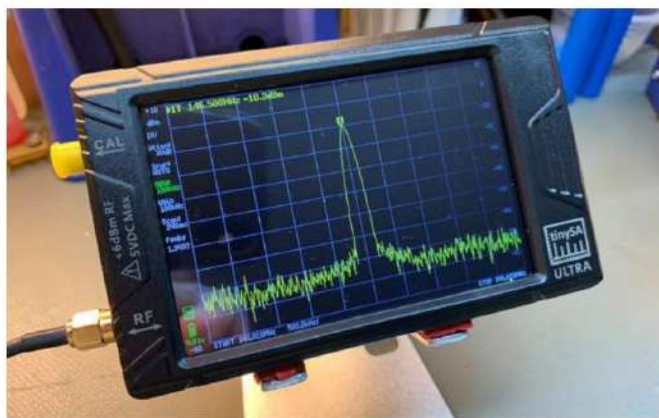


Figure 5 — The tinySA Ultra in use on its new stand. [Dino Papas, KLØS, photo]

liner material to the surfaces on which the equipment rests (see Figure 4).

It's not a perfect solution, but it provides a much better viewing angle for the device's display, and it holds the instrument more securely in place while I use it (see Figure 5). — 73, Dino Papas, KLØS; kl0s@arri.net

A Classic Interference Hunt

I'd been plagued with interference for some time. It was strongest between 660 and 695 kHz (see Figure 6), but it also showed up on several HF bands. Rather than simply living with it, I decided to track down the interference myself.

I used the classic approach described in *The ARRL Handbook*. With a battery-powered AM broadcast receiver in hand, I went to the circuit breaker panel and switched every breaker to the **OFF** position, except for the circuit that included my radio room. I then checked 670 kHz on the portable receiver and heard nothing; the interference had vanished. I returned to my station and looked at my software-defined radio receiver display to be sure. It confirmed that the interference had completely disappeared (see Figure 7).

I returned to the panel with my portable receiver and re-energized the circuits, one at a time, until the interference re-appeared. At last, I had a target location! Even so, I switched the breaker off and then continued activating the remaining breakers, in case my interfering signal had more than one source. Luckily, the signal appeared to be coming from only one circuit.

I re-energized the offending circuit and proceeded to narrow my search to the most likely suspects. On the circuit, there was a power strip, an internet router, a TV, and a DVD player. When I unplugged the power



Figure 6 — The interfering signal was strongest at around 670 kHz. It appeared on my SDR receiver display as a row of jagged peaks. It was quite noticeable on HF as well. [Kraig Krist, KG4LAC, photo]

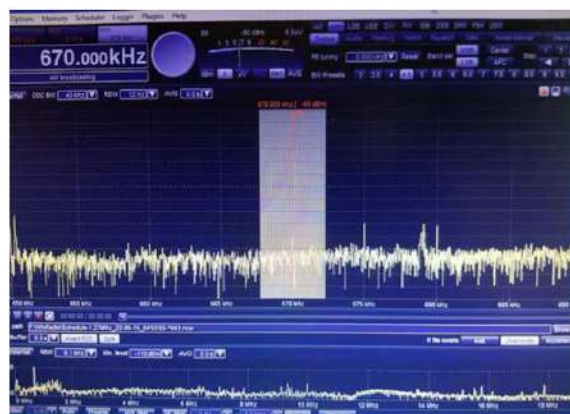


Figure 7 — With the culprit circuit deactivated, the jagged interference signature vanished and was replaced in the SDR display by the normal noise floor. It was then a matter of using a process of elimination to identify the actual source of the interference. [Kraig Krist, KG4LAC, photo]

strip, the interference remained loud and clear on the portable receiver. It also persisted after I disconnected the router power supply and the TV power cord. The only device left was the DVD player, a 20-year-old Memorex model. Sure enough, when I plugged it in, the noise returned with a vengeance. I hardly use the DVD player these days, so I left it disconnected.

Hunting interference is really just basic detective work! — 73, Kraig Krist, KG4LAC; kg4lac@arri.net

"Hints and Hacks" items have not been tested by QST or ARRL unless otherwise stated. Although we can't guarantee that a given hint will work for your situation, we make every effort to screen out harmful information. Send technical questions directly to the hint's author.

QST invites you to share your hints with fellow hams. Send them to hh@arri.org. Please include your name, call sign, complete mailing address, daytime telephone number, and email address on all correspondence. Whether you are praising or criticizing an item, please send the author(s) a copy of your comments.

An Unforgettable Excursion to Henry Island

The Antigonish Amateur Radio Club in Nova Scotia activated Henry Island Light for the 2024 International Lighthouse Lightship Weekend.

Craig Seaboyer, VE1DSS

I first met Bill Baker, W1BKR, on the air in 2012 when he appeared on the Nova Scotia Amateur Radio Association, VE1RTI, repeater. Since 2004, Bill has privately owned Henry Island, a 2-and-a-half-mile-long forested piece of land off the coast of Cape Breton Island. Bill and I had many great conversations throughout the years whenever he was vacationing on the island with his wife, Jeannemarie, K3JGB. He often invited me to visit him there, but I never had the ability to go until last year.

In July 2024, the Antigonish Amateur Radio Club (AARC) was discussing summer activities, when Jeremy Hillyard, VE1JEZ, suggested that Henry Island Light might be a great place to set up an HF station and participate in the International Lighthouse Lightship Weekend (ILLW). Bill reached out over the radio in August, stating that they were going to be on the island for a few weeks, so I asked if a small group of four to six amateur operators could set up their equipment on his lighthouse for a day during the weekend of August 17 – 18, 2024. He was very excited to accommodate us and had only two requests: help him set up his new Carolina Windom antenna and Icom IC-7300, and bring gasoline to run the generator, distilled water for his batteries, paper cups, and enough extra food for him and his wife (we chuckled about that and told him we would take care of it).

Making Plans

We planned our excursion for Saturday, August 17. Bill stated that in order to access the island, we would have to board a 27-foot Zodiac boat that would bring us and our gear to the island's beach, as there was no wharf. There also wasn't a power grid, but he said we could use his batteries.

Our small group, consisting of Jeremy Hillyard, VE1JEZ; Mike Williams, VA1KMA; Evan Mosher, VA1ECM; Paul Fraser (who is studying for his license after taking the online Radio Amateurs of Canada course), and me, divided the workload evenly, and each of us contributed various equipment for the operation (I brought my Yaesu FT-991A to have as a spare

radio). Bill said we could use his four-wheeler and small utility trailer to bring our gear up to the site (it was a half-mile hike to get from the beach to the lighthouse, and it was fairly steep).

Bill also informed the locals in Port Hood, Nova Scotia, that our club would be activating the island via ham radio and welcomed them to travel by boat to see us in action and tour the lighthouse and his home.

Arrival and Setup

August 17 finally came, and it was a beautiful day. The five of us met at a local Tim Hortons at 8:00 AM, before carpooling to Port Hood to catch our boat to Henry Island. We met the boat's captain at a private harbor



The operators walked from the beach to Henry Island Light with their gear.



ILLW operations occurred from inside the lighthouse.

and loaded our gear into the Zodiac by 9:30 AM. The trip took about 25 – 30 minutes.

When we arrived, Bill and Jeannemarie were there to welcome us and provided some history on Henry Island Light. Evan drove the four-wheeler — loaded with all our equipment — up to the site, while the rest of us walked.

At the end of our journey through the woods, we were presented with a stunning red and white house that had matching outbuildings and a lighthouse. Bill and Jeannemarie had already set up an antenna on the lighthouse railing, as well as a new radio, and Bill had made a few contacts already. His inverters, normally used in his power grid, were turned off, as they were noisy on HF. We found that the best place for our equipment was in the base of the lighthouse, out of the direct sun (a nice sea breeze came through the open door and windows). We set up the Yaesu FT-991A on an antique table that normally holds island relics, and ran a power and antenna line from the upper stories to our radio room. Jeremy set up his *WSPR* node at 0.2 W on the lawn near the lighthouse.

Spreading the Joy of Radio

As we prepared for lunch, I had the privilege of making Bill a lifetime honorary member of our club. Afterward, as we started making contacts, about 40 to 50 locals arrived. We explained who we were, what we were doing, and what the ILLW contest was. One gentleman played guitar and sang near the house while we made contacts all over the world. Each AARC member got some air time and, because one of our members is unlicensed, there was another operator logging the contacts. We logged about 30 contacts and chatted with the interested public. When not in the radio room, we took the opportunity to check the local 2-meter repeaters to see how many we could contact just using



Bill Baker, W1BKR, shared a bit of history on Henry Island Light.

our portables. We contacted quite a few, including our local Fusion repeater, VE1RMW.

The afternoon went by quickly, and by 5:00 PM we started to break down our equipment and put all the antiques back where we found them. As Bill and Jeremy were configuring the IC-7300 to work with Winlink, Evan and I made dinner.

As the sun started to set, our crew loaded the gear into the trailer to bring back to the beach. The boat ride home was wonderful, with a picturesque sunset.

For more information on ILLW, visit www.lighthouse-weekend.international. The 2025 event took place on August 16 and 17.

All photos provided by the author.

Craig Seaboyer, VE1DSS, has been licensed since 2010. He's active in the Antigonish Amateur Radio Club and the Nova Scotia Amateur Radio Association, of which he is vice president. For the last 5 years, Craig has taught several seminars for amateur radio operators at the Symposium for Maritime Amateur Radio Technology (SMART). He's also been active in his local emergency management office for the past 10 years. Craig has spent 30 years as the Senior Electronics Technologist and Consultant in the University Electronics Workshop at St. Francis Xavier University in Antigonish, Nova Scotia, where he services and creates electronic equipment for the teaching and research community in science and arts faculties. Craig can be reached at cseaboyer@stfx.ca.

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



Add an SDR Receiver to Any Ham Radio

Improve your receive performance, without compromising your main transceiver, using an SDR switch with an LNA.

Hayden Honeywood, VK7HH/KD9SSB

Hayden Honeywood, VK7HH/KD9SSB, shares practical projects and tutorials for hams around the world on his YouTube channel, Ham Radio DX. The information in this article comes from one of his more recent videos, "Add a SDR Receiver to ANY Ham Radio Rig!" (www.youtube.com/watch?v=TEgRoLsSoc).

I'm passionate about the 6-meter band and working all the DX entities on it, so improving the receive performance of my station is my number-one priority. Recently, I came across a couple of images that piqued my interest in using an affordable software-defined radio (SDR) with my own station.

The first image I saw, shared online by Paul Newcombe, N2EME, showed the entire 6-meter band being received simultaneously using nothing more than a \$35 Nooelec RTL-SDR dongle (see Figure 1). With this setup, the SDR isn't being used as a panadapter, but as the receiver. CW and single sideband (SSB) signals were going to speakers, and all the *WSJT* frequencies were getting decoded simultaneously with individual instances of *WSJT* or *JTDX* running at once. In fact, you could have up to 24 receivers active at the same time, allowing you to monitor multiple frequencies. Running this setup requires a basic computer with enough power to run Windows — that's all you need.

Additionally, Kirk Pengelly, NØKK, shared an image online (see Figure 2) that shows an IC-7610 and an Airspy HF+ SDR running side by side on *SDR Console* (www.sdr-radio.com/console). Both were connected to the same antenna, attempting to receive the same station. The comparison revealed something striking: The signal was nearly invisible on the IC-7610's waterfall, while *SDR Console* decoding with the Airspy HF+ clearly displayed the individual dots and dashes of the CW signal. This test, performed on the 15-meter band,

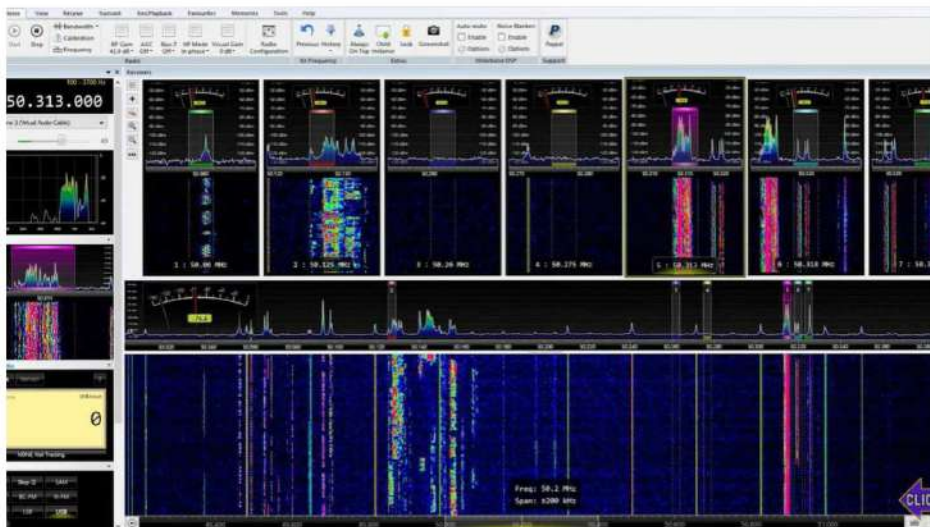


Figure 1 — This setup allows you to monitor multiple frequencies and requires only a computer with enough power to run Windows. After reading the article, watch the companion video on YouTube.

showed just how powerful SDRs can be for weak-signal operating.

I wondered if I could replicate these results with my own IC-7610 and a bottom-of-the-range RTL-SDR. I've also experimented with other SDRs, including the



Figure 2 — An IC-7610 and an Airspy HF+ SDR running side by side on *SDR Console*.

10m Band - WSPR Spots						
All Spots (96h)						
Rx call	R/G	total_spots	unigs	avgSNR	avgK	maxK
HB9CU/3	SDR/Airspy HF+	7486 (+19%)	514 (+11%)	-17	5388	15847
HB9CU/1	SDR Console/Airspy HF+	7455 (+18%)	517 (+12%)	-17	5353	15847
HB9CU/2	Flexradio 6600/SmartSDR	6313	462	-17	5255	15667
DX Spots > 3000 km (96h)						
Rx call	R/G	total_dx_spots	unigs	avgSNR	avgK	maxK
HB9CU/3	SDR/Airspy HF+	5217 (+21%)	379 (+11%)	-18	7099	15847
HB9CU/1	SDR Console/Airspy HF+	5155 (+19%)	373 (+9%)	-18	7097	15847
HB9CU/2	Flexradio 6600/SmartSDR	4317	341	-18	7004	15667
DX Spots > 6000 km (96h)						
Rx call	R/G	total_dx_spots	unigs	avgSNR	avgK	maxK
HB9CU/3	SDR/Airspy HF+	4833 (+22%)	330 (+12%)	-18	7245	15847
HB9CU/1	SDR Console/Airspy HF+	4780 (+21%)	325 (+11%)	-19	7241	15847
HB9CU/2	Flexradio 6600/SmartSDR	3959	293	-18	7171	15667

Figure 3 — HB9VQQ's comparisons of WSPR decodes between an Airspy HF+ connected via an IF tap on a Yaesu FT-450D and another HF+ connected through an SDR switch.



Figure 4 — Hayden Honeywood's, VK7HH/KD9SSB, SDR setup.

Airspy Mini and the RSP1A (which has since been replaced with the RSP1B).

Dual-Receive System Setup

There are two main ways to set up a dual-receive system: with an IF tap or with an SDR switch. I'm not a fan of IF taps, because they rely on your radio to process the signal before it gets to the SDR. Additionally, bandwidth can be limited in some setups. My IC-7610 has an IQ output that can be connected to SDR software, but it only supports *HDSDR*.

I found a test by HB9VQQ that compares *WSPR* decodes between an Airspy HF+ connected via an IF tap on a Yaesu FT-450D and another HF+ connected through an SDR switch (see Figure 3). The SDR switch provided raw RF signals directly to the SDR, bypassing the radio's internal processing. The results were night and day, with the SDR switch setup showing clear advantages in decoding performance. HB9VQQ also compared the Airspy HF+ to his FLEX-6600, with the Airspy outperforming the FLEX in *WSPR* decodes by 20 percent during a 96-hour period. This highlights the



Figure 5 — A TQP3M9037-LNA amplifies the signal before it reaches the SDR.



Figure 6 — A 20 dB attenuator helps ensure the signal isn't overloaded.

effectiveness of using an SDR switch, especially for DXing and weak-signal operating.

SDR Switch Details

I've been using an SDR switch from www.sdrswitch.com. These are not the most affordable options, but they are designed specifically for weak-signal and DX operations. The insertion loss is remarkably low, ranging from 0.035 dB at 3.5 MHz to 0.166 dB at 450 MHz. Isolation figures are also excellent, ensuring that RF from your transceiver doesn't damage your SDR or low-noise amplifier (LNA), which is possibly the most important detail to look for when purchasing an SDR switch.

For comparison, "MFJ-1708SDR and MFJ-1708B-SDR TR Switches," reviewed by Mark Wilson, K1RO, in the March 2019 *QST* Product Review, shows that the MFJ-1708SDR TR switch has a 19.6 dB insertion loss on 70 centimeters. That's like reducing your audio volume from 100 percent to just 1 percent, which explains why some hams find that low-cost SDR switches can make their SDRs "deaf."

My Setup

Figure 4 shows my setup. My SDR switch is powered by 12 V, connected via a Powerpole connector. The push-to-talk (PTT) port is connected to my IC-7610 via a five-pin DIN cable (this triggers the SDR switch relays when the radio transmits). The LNA is powered by the SDR switch, with a 12 to 5 V adapter providing power through USB.

The antenna signal enters through the SDR switch, passes through the relays, and exits through the RX out port. Before reaching the SDR, the signal is amplified by a TQP3M9037-LNA (see Figure 5), which provides 20 dB of gain and has an extremely low noise figure.

To prevent overloading the SDR, I added a 20 dB attenuator after the LNA (see Figure 6). This ensures the signal is properly balanced. A two-way splitter then directs the signal to the SDR and transceiver. The 3 dB loss from the splitter is negligible due to the LNA's gain.

When transmitting, the SDR switch bypasses the LNA and SDR entirely, protecting them from RF damage.

In Conclusion

Using an SDR switch with an LNA dramatically improves receive performance without compromising your main transceiver. Paired with software such as *SDR Console*, you can run an SDR side by side with your older transceivers that may lack a waterfall, dramatically increasing your operating experience. While the setup may look complicated, it's straightforward once you break it down. This configuration allows me to monitor the entire 6-meter band and decode multiple signals simultaneously, making it invaluable for DX and weak-signal operations.

Hayden Honeywood, VK7HH/KD9SSB, is an avid experimenter and content creator who's passionate about inspiring, promoting, and educating hams. He's 34 years old and has held an amateur license since 2004. Hayden shares practical projects and tutorials on his YouTube channel Ham Radio DX (www.youtube.com/HamRadioDX) with the hope of encouraging hams around the world to have fun with amateur radio.

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

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Field Organization Reports — June 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.

435 AC8NP	208 K9SX	145 KC9FXE W9GRG W9BGJ W1LEM	123 KE5YTA K3JL	100 KA5AZK NX9K AD4DO KZ8Q WB4RJW W2PXE W1KX N1LAH KC1KVY W1TCD W4EDN K2VTT KD2PQP K2MTG K3YAK KB2QO WD8SDH KB8GUN N8MRS KC8PBU WB8SIQ	94 KA2HZP	KR4ST W2ITT N1HAN KA8BJA
415 W4DAN	190 N4CNX	120 WA4VGZ WC4FSU NA7G W2AH KD8UUB	116 N3GE K8MDA	92 NI2W K2PHD	79 K3RC	
370 N9VC	189 W2ARP	144 KR4PI KD0HHN	115 W8IM K1YBO	90 KC9UC KB9GO W5RFY AB9ZA WA3QPX N1CVO KN4AAG W4KX W2QMI W8MAL N8OD K8KRA	78 K3EAM	
360 AD8CM	180 N2LC	140 AC0KQ KF5OMH N1ILZ WK4WC N8SY	110 KM4WHO N1IQI W1RVY	89 W4TTO	77 K1CJV KT5SR	
329 W7PAT	175 W9FE	135 WA3QLW AG9G W3YVQ	106 N2DW KT5EM AD3J	99 KC1HHO	76 K6RAU W2ZXN	
325 W9RY	174 W9EEU	130 WB9EDL K5ANP WB9WKO K9LGU W4CMH KY2D KW1U N1UMJ	105 N0JAR NW3X KL7RF	97 N3STP KT4WX	75 WB3FTQ AA3N	
302 W7EES	171 W5WMC	168 KN4QJ	102 KM4WXX	96 N4NOA	74 W3ZR	
270 WM5N	170 KA9IKK	155 K5OB	95 N3PRB W8GSR	88 W8STN K1STM KC8WH	73 NT1N WJ3P KB2YAA	
255 WB8YYS	168 KN4QJ	154 KO4KUS		84 KF7GC N0ET	71 KK7FYW	
254 KD2LPM	155 K5OB	125 W2PAX		80 KG5AOP KB4OLY KM4BRQ	70 KC2THY	
235 W0PZD	154 KO4KUS	148 KB5PGY				
230 KY2MMM	152 KC8T					
220 K7OED	148 KB5PGY					

The following stations qualified for PSHR in May 2025, but have not been recognized in this column yet: KB3YRU 125, WX2DX 90, KA0DBK, WD0BFO 72.

Section Traffic Manager Reports

The following Section Traffic Managers reported: AR, AZ, CO, CT, DE, EMA, EPA, GA, IA, IL, IN, LA, MDC, ME, MO, NC, NFL, NLI, NM, NNJ, NNY, NTX, OH, OR, RI, SFL, SJV, SNJ, STX, TN, UT, WCF, WI, WMA, WNY, WWA, WY.

Section Emergency Coordinator Reports

The following Sections submitted ARES Activity Reports for May: CT, EMA, ENY, EPA, GA, IL, IN, MDC, MN, MO, NC, NFL, NNJ, NNY, NTX, NV, OH, SC, STX, TN, VA, WCF, WI, WMA, WPA, WTX.

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.

KY2D 1,697, NX9K 1,397, W2AH 1,315, KW1U 655, WB9WKO 652, WA3QLW 631, KE5YTA 533, N9CK 514.

YOTA Camp: Empowering the Next Ham Generation

An Argentinian operator was inspired by the program's peer-led approach to learning and enjoyed connecting with other young hams.

Bianca Montenegro, LU9YBM

I had the incredible opportunity of attending the 2024 Youth on the Air (YOTA) camp (<https://youthontheair.org/camps>) in Halifax, Nova Scotia. I initially became a ham in 2023 because I come from a family of them, but I was pleasantly surprised by how much I enjoyed the hobby once I became more involved. Attending YOTA camp not only helped me to improve my technical skills, but it also ignited a deeper interest for the hobby within me. It entailed 1 week filled with learning, operating high-end equipment, and connecting with other young operators from around the world.

Benefiting from Youth Leadership

A standout feature of YOTA camp is its strong emphasis on designing an environment for young operators to step up and lead. Camp organizers set a goal of ensuring that at least 50 percent of the sessions each year are led by young hams — and they exceeded that goal at the 2024 camp. Having a focus on youth leadership is incredibly inspiring and empowering to campers. Getting to watch my peers take charge, share their knowledge, and guide others through complex topics was an unforgettable experience. It wasn't just about learning from experienced operators; it was about learning from those who were at the same stage of their ham radio journey. This peer-led approach made the learning process more relat-

able and accessible, especially for someone like me who is relatively new to the hobby. I hope to be able to be a part of the camp's youth leadership in the future.

Expansive Learning Opportunities

Another one of YOTA camp's goals is to encourage every camper to make at least one contact using the call sign VE1YOTA. This was a significant milestone for me in my ham radio journey. I was apprehensive about using the radio, mainly because of my limited experience, but the supportive atmosphere and encouragement from fellow campers and staff helped me overcome this and make my first contact! The thrill of that first successful contact sparked a newfound confidence in my abilities and fueled my desire to make more; by the end of camp, I had made several contacts.

Campers were able to operate using high-end gear like Icom IC-7300 and IC-7610 transceivers, as well as Heil Sound's Pro 7 headsets. I had previously only operated with a basic setup at home, so using this state-of-the-art equipment was a game changer. The clarity and precision of the gear allowed me to reach countries and operators I have never been able to contact before from my home station. Operating with this equipment opened my eyes to the potential of what



Bianca Montenegro, LU9YBM, operating VE1YOTA during the camp's POTA activation on Georges Island. [Ethan Rushton, KO4VXD, photo]



Bianca Montenegro, LU9YBM (on the left), and Ruth Willet, KM4LAO (on the right), during the YOTA camp closing ceremony, where Bianca won an Arrow antenna. [Sam Rose, KC2LRC, photo]



YL YOTA campers: (back row, from left to right) Bianca Montenegro, LU9YBM; Ariel Blum, VE2SZU; Katie Campbell, KE8LQR; Mia Boudreau, VA1ALO; (front row, from left to right) Grace Lea, KE3G; Cynthia Squires, KK7TLD; Hope Lea, ND2L, and Wintta Ghebreyesus, VA3WGY. [Sam Rose, KC2LRC, photo]

I could accomplish in the hobby with the right tools and knowledge. It also motivated me to continue learning and improving my skills, knowing that there is always room for growth in the world of ham radio.

YOTA camp offers a wide range of activities and learning opportunities that go beyond making contacts. I participated in my first Parks on the Air® (POTA®) activation, which was an exciting and challenging experience; soldered for the first time, building a simple code practice oscillator and a manual Morse keyer that I can use with my radio at home; learned and practiced CW; discovered satellite communications, and participated in an Amateur Radio Direction Finding (ARDF) fox hunt. Each of these activities broadened my understanding of the hobby and provided me with new skills that I'm eager to develop.

Fostering a Community for Young Hams

One of the most impactful aspects of camp for me was the sense of community and camaraderie that developed among participants. YOTA camp is not only about radio; it's also about connecting and spending time with other young hams. We explored downtown Halifax through a tour on an amphibious vehicle (which works on land and on or under water), watched the Argentina-Canada Copa América football match, and visited the Maritime Museum of the Atlantic and His Majesty's Canadian Ship *Sackville*.

I connected with young hams from different parts of the world, each one bringing their own experiences and perspectives to the table, and was inspired by all the female operators I got to meet.



Bianca Montenegro, LU9YBM (on the left); YOTA Camp Director Neil Rapp, WB9VPG (in the middle), and Theo Pastrana, LU1XOP (on the right), holding the Argentinean Radio Club's (Radio Club Argentino) flag signed by all the camp attendees. [Sam Rose, KC2LRC, photo]

By the end of the week, I had gained more than just new ham radio skills — I also built new friendships. The sense of belonging to a global community of young hams is something I will carry with me; it's a reminder that no matter where we come from, we all share a common passion that brings us together.

Looking Ahead

I am incredibly grateful for the opportunity to attend YOTA camp and am excited to continue my journey in ham radio with the skills and friendships I gained from the unforgettable experience.

As I look ahead, I am eager to apply what I learned at camp to my own ham radio activities. Whether it is participating in more POTA activations, improving my CW skills, or experimenting with new equipment, I know that the joy for ham radio that YOTA camp ignited in me will continue to grow. The experience has shown me that ham radio is more than just a hobby — it's a lifelong journey, and I can't wait to see where it takes me next!

Bianca Montenegro, LU9YBM, is 23 years old and currently finishing her studies to become an English translator. She's been a licensed ham since August 2023. Bianca is a member of Radio Club General Roca, LU3VAL, and Radio Club Argentino, LU4AA, and is chair of the YOTA commission of LU4AA. In December 2023, she participated in her first YOTA Month and made more than 100 QSOs with hams in seven countries: Argentina, Chile, Brazil, Mexico, the United States, Costa Rica, and Jamaica.

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

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A POTA Activation on a Volcano

With an EFHW, IWØHK operated on 20 meters
from the iconic Vesuvius National Park.



The author's portable setup along the crater of Mount Vesuvius.

Andrea Borgnino, IWØHK

For me, ham radio is a portable activity. Whether I'm activating a mountaintop for Summits on the Air (SOTA) or operating SSB or CW from a Parks on the Air® (POTA®) park, the most important thing is that there is no roof over my station. I find myself transmitting almost exclusively when I'm away from home.

I had dreamed about my next activation idea for a long time. In short, I wanted to climb — strictly on foot — to the top of a volcano, and then transmit from either a POTA or a SOTA reference. I live in Rome, so I knew the most convenient volcano for me to access would be Mount Vesuvius, which is part of the larger Vesuvius National Park (POTA reference IT-0675). After settling on this location, I spent the next several months researching how to make my dream become a reality. In March 2024, I succeeded in making it happen.

Planning Phase

My portable activity is strictly shortwave — no VHF/UHF — because I love the crackle of HF and want to hear it everywhere. This means that I have to come up with a different antenna solution for each activation, depending on the summit or park. I typically choose between a classic vertical antenna, which requires me to install several radials on the ground, or a simple end-fed half-wave (EFHW) wire antenna, which requires less space and can be extended on a fishing pole. For my Mount Vesuvius activation, I chose a wire antenna because I anticipated limited space and a lot of people around the edge of the volcano. A vertical antenna with radials can be dangerous at sites with many visitors, so I knew a wire stretched out on a fishing pole would be a better option.

Thanks to Wikiloc (www.wikiloc.com), an excellent website that allows users to share trails and GPS tracks, I was able to find the best way to climb the volcano and, most importantly, the best place to set



A hazy view from one of the trails at the base of Vesuvius.

up my radio. Wikiloc is a collaborative web portal and app where thousands of people upload and share tracks of their hikes, and anyone can download those tracks in various formats. This makes it possible to find safe, already-traveled trails that you can upload to your smartphone and follow later. After various searches, I found an interesting trail that starts from the town of Ottaviano in Italy's Campania region, located at the base of the volcano. Following two other trails in Vesuvius National Park, it leads to the edge of the crater at an altitude of 1,184 meters. I downloaded the GPX file of the trail to my phone and, along with the free Android app "Gaia GPS," I had every tool I needed to follow the trail to the volcano.

Setting a Date and Departing

Work, commitments with my children, and many other things kept leading me to postpone the date for climbing Vesuvius. I eventually settled on Easter as the perfect date for the activation; I would be with my 14-year-old son, Emilio, who I could bring with me. Emilio's friend and his mother also volunteered to tag along. So, on March 31, 2024, we set off from Rome in the direction of Ottaviano, where we arrived after a roughly 2½-hour drive. The weather was hazy, and we couldn't see the sea below, but it was warm and not raining. We began our hike on trail number one, "Valle dell'Inferno," which is well marked with yellow signs. After about 2 hours of walking, we reached the start of

trail number five, "Gran Cono," which leads directly to the edge of the volcano's crater.

We had a moment of panic at this point because visitors must buy tickets to access the Gran Cono trail. Following the COVID-19 pandemic, tickets became available only online, and the portal was not working for us for at least 20 minutes. Fortunately, we managed to buy them and continue. A tip for those who want to venture on this hike: buy the tickets online beforehand.

The terrain mostly consisted of sand and pumice stones, and it became more difficult to walk on as we progressed. We walked for another 2 hours, completely alone and surrounded by nature, before finding ourselves in the most tourist-filled part of the trail. In fact, the Gran Cono trail is the one generally walked by tourists who are partially driven up the volcano by car or bus. By the time we reached the top, we found ourselves among hundreds of people walking around the crater. It was a beautiful and incredible place, despite the crowds.

Activation at the Peak

It was time to figure out where to set up my radio to activate Vesuvius National Park. There was little space, and an unexpected strong wind was picking up; the wind hadn't bothered us while we were on the Valle dell'Inferno trail. I decided to set up at the end of the



A curious tourist taking a look at the author's radio.

trail, where there seemed to be fewer people. The wind was so strong that I didn't trust my usual 5-meter-long fishing pole to withstand it, so I stretched out my EFHW wire and attached it to a fence post that bordered the crater.

I turned on my Elecraft KX3 and remembered that the SSB portion of the CQ World Wide WPX Contest was being held at the same time. The 20-meter band, a favorite for POTA and SOTA, was more crowded than ever. Nevertheless, I found an almost-free frequency and started calling. I made a few SSB contacts, but I had the feeling that the interference and splatter from the contest wouldn't allow me to continue. So, I switched to CW and made 11 contacts — one more than the 10 required for a POTA activation.

Descending with a Sense of Accomplishment

After quickly dismantling the station, we walked the entire Gran Cono trail and then resumed hiking Valle dell'Inferno. In total, we walked for 4½ hours, covering 16 kilometers with a 723-meter elevation gain. It was a beautiful hike with splendid views — rocks and colors that only a volcano can offer.

For many operators, 11 contacts may seem like too few for a standard activation, but for me, it was a perfect



The author on 20-meter SSB after reaching the top of the volcano.

amount considering the circumstances; I had only a short time to operate, there were too many people around, and the position was uncomfortable. When it comes to POTA and especially SOTA activations, I believe the number of contacts is not the most important takeaway. Each portable experience has many other components, and what really matters is getting out there, having fun, and going home with a sense of accomplishment. I'm already dreaming of my next trek, perhaps to Mount Etna. I'm satisfied knowing that I did what I initially set out to do: experience the joy of operating at the top of a volcano.

All photos provided by the author.

Andrea Borgnino, IW0HK, obtained his Class B operator license in Torino, Italy, in 1991, and upgraded to his current call sign in 2002. He operates mostly CW and digital modes on the HF bands. Andrea runs a QRSS-QRP beacon on the 10-meter band and a QRPP WSPR CW beacon on the 30-meter band. He's active in POTA and SOTA, and he is the SOTA Association Manager for Italy. Andrea can be reached at a.borgnino@gmail.com.

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



Strays

QST Congratulates...

John Tramontanis, N4TOL; Mike Weathers, ND4V, and Jeff Cantor, K1ZN, on being inducted into the South-eastern DX Club Hall of Fame. Inclusion in the SEDXC Hall of Fame is an honor bestowed on club members who have distinguished themselves with long and outstanding performance in the ARRL DXCC program, the SEDXC, and the DX community. John, Mike, and

Jeff have served the SEDXC, collectively holding officer positions 34 times since 1992. They are all on the ARRL Honor Roll, are ARRL A-1 operators, and have positively enhanced the reputation of the SEDXC at numerous functions and venues, including as officers of other clubs. For more than 30 years, only 28 amateurs have been inducted into the Hall of Fame.

Staying Current on Disaster Preparedness

Regularly evaluating our EmComm procedures can help ensure readiness for any crisis, with or without the use of commercial technology.

Steve Aberle, WA7PTM

September is National Preparedness Month, which is a good time to perform an annual review of one's operations, especially regarding emergency communications. There is often an over-reliance on commercial technology for public service communications, resulting in inadequate practices simulating its absence. Throughout the last quarter century, amateur radio has taken a backseat to fancy (and costly) electronic gadgets promoted by the purveyors of commercial EmComm solutions. However, even with grants funding many of the technology acquisitions, budgets are far from infinite, and volunteers will always be needed.

This article is a collection of elements from After-Action Reports (AARs) — plus items that should have gone into AARs — in the aftermath of drills, exercises, and deployments that may be beneficial to incorporate into your planning to be better prepared for technical deficiencies during a disaster.

Whether you're getting prepared as an individual or as part of a group, it's important to establish a communications primary, alternate, contingency, and emergency (PACE) plan. In essence, a PACE plan is a triple-redundant protocol for failover to another communication method to maintain an end-to-end communi-

cation path. Your primary method will be the same as what you use to communicate daily.

Individuals

- Consider FRS and GMRS radios, as well as non-electronic means of communication, when developing non-ham redundant options for your family's PACE plan.
- Be sure your disaster kit of personal items can sustain being deployed to a remote location for an extended period. When preparing items for your kit, consider the essentials and their portability.
- If Winlink is part of your disaster response, create a short list of Radio Mail Server (RMS) stations you're usually able to contact to carry with you. A printed list is resilient to potential power issues that may affect electronic devices.
- Remain current on Federal Emergency Management Agency (FEMA) training.
- If necessary, upgrade your radio go-kit to include portable solar charging.
- When not in use, store your radio gear in containers that can resist electromagnetic pulse (EMP) events.
- Learn how to read maps and include them in your radio go-kit. Electronic devices with GPS may not be available during an emergency, especially if they require an always-on network connection.

Groups

- Plan to emphasize the "Relay" in ARRL's name. Relaying messages to distant locations is needed when HF is disrupted during space-weather events, but this is becoming a lost skill.
- Involve and train the next generation of EmComm volunteers. The past few decades have seen an ever-increasing average age for EmComm volunteers. This trend has advantages (more experience and increased free time among retirees) and disadvantages (less mobility and digital technology challenges).



Ed Stuckey, AI7H, demonstrates how to use a Kenwood TS-690S to FEMA Citizen Corps volunteer Marcos Luna.



Mike Berck, W7MPB, unloads donated food cargo from his 1974 Grumman American Avn. Corp. AA-5 Tiger aircraft, which he also uses as an airborne amateur radio communications platform during disaster response exercises.

- Promote your group as being volunteers with communications, rather than communications volunteers, to increase the likelihood that you'll be called upon in times of emergencies and disasters (thanks to Toby Clairmont, KH7FR, for this concept). Don't hesitate to perform non-radio tasks if asked, as this will allow your group to gain wider acceptance in the emergency management community as team players.
- Develop and publish a "Who Ya Gonna Call?" list for frequencies that will be in use and for radio traffic. Complete a Communications Resource Availability Worksheet (ICS 217A) for that purpose. This information will feed into your Incident Radio Communications Plan (ICS 205), which should be prepared by the Communications Unit Leader and then given to the Planning Section Chief to include in the Incident Action Plan for each operational period.
- Set up a local radio-only alerting system using the tone squelch feature on members' radios. Local groups can easily set their receivers to be on a pre-arranged frequency with tone squelch set to open the speaker. With this setup, a specific CTCSS tone is then transmitted by the group leader(s). Some repeater controllers can be programmed to recognize multiple tones to extend the alert and activation range for the group, but this system doesn't address how to alert and/or request resources from other EmComm groups in the state or the next county.
- Encourage information exchanges between experienced and new hams. Learn techniques that can help overcome technical deficiencies.
- When conducting a drill or exercise, don't rely on

commercial infrastructure (e.g., calling the other radio operator on the phone to arrange a frequency), as this doesn't adequately prepare one for what they might face in a disaster.

- Advocate for the concept of exercising amateur radio in parallel with non-EmComm communications during emergency drills and exercises with served agencies. Comparing the results will be part of the AAR and Improvement Plan (IP).
- While all emergencies are local (in terms of an initial response), be prepared to help EmComm teams in neighboring jurisdictions by identifying members with good skill sets and portable stations to be part of one or more teams that can travel to assist other areas.
- Ask one of your served agencies if they will authorize EmComm members for Wireless Priority Service (WPS) and Government Emergency Telecommunications Service (GETS) access. This may help when commercial infrastructure is degraded but not completely disrupted.

Statewide

- Partner with, and become embedded in, Voluntary Organizations Active in Disasters (VOADs), Community Organizations Active in Disasters (COADs), and non-governmental organizations (NGOs).

Communications Method Description	Anticipated Usable Methods at Each PACE Level			
	Primary	Alternate	Contingency	Emergency
Aviation Volunteers				
Landline phone (PSTN), Cellular phone, Internet (terrestrial-based)	●			
Satellite phone	○	●		
VHF Airband (118.000 to 136.975 MHz)	●	●	●	●
Communications Volunteers				
Landline phone (PSTN), Cellular phone, Internet (terrestrial-based)	●			
VHF/UHF FM & SSB radios (voice and data) – amateur radio [repeaters with solar or backup power]	○	●		
MF/HF SSB radios (voice and data) – amateur radio [no solar storms]	○	●	●	
VHF/UHF FM & SSB radios (voice and data) – amateur radio [station to station relaying]	○	○	●	●
VHF/UHF FM handheld radios – amateur radio [simplex]	●	●	●	●
Logistics Volunteers				
Landline phone (PSTN), Cellular phone, Internet (terrestrial-based)	●			
UHF FM radios – GMRS (General Mobile Radio Service)	●	●	●	●
UHF FM radios – FRS (Family Radio Service)	●	●	●	●
Other Communications Services				
SHF radio-based data networks – amateur radio	○	○		
VHF/UHF FM radios (voice and data) – LMR (Land Mobile Radio)	○	○		
Landline phone with GETS (Government Emergency Telecommunications Service) authorization		○		
Cellular phone with WPS (Wireless Priority Service) authorization		○		
HF SSB radios – CISA SHARES (SHARED RESources)	○	○	○	○
VHF FM radios – marine band	○	○	○	○
VHF FM radios – MURS (Multi-Use Radio Service)	○	○	○	○
Temporary Phone Systems (commercial vendor response vehicles, e.g. SatCOLT, SatCOW, Flying COW, miniCRD, etc.)			○	○

Sample selections for a communications PACE plan.

- Create a non-repeater cross-state network VHF/UHF message relay system for when the HF bands are affected by adverse space weather.
- Obtain a radio-only alerting system that will work throughout the state.

Nationally

- Construct a series of multimedia presentations where public service leadership (emergency management, law enforcement, firefighting, health and medical, energy, etc.) speak directly to their counterparts who have not yet adopted amateur radio into their emergency and disaster planning.
- Adopt the International Amateur Radio Union (IARU) Emergency Center of Activity frequencies, and establish them for the missing bands.
- Work with owners of radio propagation beacons to network them together. Develop a protocol so that they can be used to broadcast disaster response information and radio contact frequencies when needed.

In Summary

As an amateur radio community, it behooves us to continually strengthen our practices. We must examine commercial technologies in the EmComm arena, as well as our own preparedness, to identify shortcomings and ensure we're providing solutions geared toward emergency management.

All photos provided by the author.

Steve Aberle, WA7PTM, earned his license as a teenager in 1970 as WN7PTM. He has been active in ARES since 1976 (when it was still AREC) and RACES since 1979, and has been an ARRL Official Emergency Station in the State of Washington since 1999. For more than 4 decades, Steve has volunteered in emergency communications with responses, exercise planning and evaluation, training, and mentoring, and he continues to volunteer in Washington, Oregon, and tribal nations. During his multifaceted career, Steve was a law enforcement first responder, a county emergency communications director, an information technology systems analyst, a data network manager, and a cybersecurity consultant. He can be reached at wa7ptm@arrrl.net.

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

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If you enjoyed this article, cast your vote at www.arrrl.org/cover-plaque-poll

Congratulations

June 2025

QST Cover Plaque Award Winner

*Frank Donovan,
W3LPL, and
Rol Anders, K3RA*

Maximize Your ARRL Field Day Performance

Expert advice from the W3AO team will help you get the most out of your station, regardless of the bands, modes, and antennas you may be using.

Frank Donovan, W3LPL, and Rol Anders, K3RA

If you are a Field Day enthusiast, perhaps you have worked W3AO (see Figure 1). Our group has entered Field Day for more than 20 years in categories with many transmitters on the air simultaneously, often exceeding 10,000 contacts. Groups often ask us for recommendations on how to improve their scores, given that we have transmitters on virtually all modes and bands whenever and wherever there is a chance that contacts can be made.

Bands and Modes

The most common question we are asked is: "What bands and modes should we concentrate on?" Because we are on all bands and modes simultaneously, W3AO has extensive data that will help you make decisions. The 20- and 40-meter bands are by far the most productive Field Day bands due to propagation. Forty meters is open around the clock, and 20 meters is open much longer than every band other than 40. Year after year, our highest contact totals have been on 20- and 40-meter SSB. But the Field Day scoring system always produces our highest point totals on 40- and 20-meter CW. If you have one or more operators with CW skills, those two CW bands should be their highest priority. As you can see in Table 1, our 40- and 20-meter CW, SSB, FT8, and Get on the Air (GOTA) stations have exceeded our point totals

on every other band. If you do not have one or more experienced CW operators, excursions to FT8 on 40 and 20 meters could be among your most productive operating periods.

CW, SSB, FT8, and GOTA Stations

To capitalize on the enormous potential of 40 and 20 meters, it is obvious that you should spend as much time on both bands as possible. That means having the ability to operate at least two modes on these bands simultaneously. One hundred watts of RF and basic antennas provide the opportunity to simultaneously operate multiple transmitters on the same band with little to no mutual interference. W3AO operates as many as four stations simultaneously on both 40 and 20 meters — SSB, CW, FT8, and sometimes GOTA.

If you're considering the use of four simultaneous transmitters on the same band, the question remains: "How do you do that?" All W3AO antennas on the same band are horizontally polarized, are installed end to end with at least one-half wavelength of separation between them, and are oriented broadside to the highest concentrations of population. When operating an SSB GOTA station in the same band and at the same time as the main SSB station, their frequencies are separated as much as possible.

Cross-Polarization Does Not Adequately Reduce Inter-Station Interference

Years ago, we tried the "cross-polarization solution" by installing a quarter-wavelength vertical antenna as far



Figure 1 — The W3AO Field Day team in action. [Audrey Suhr photo]

Table 1 — W3AO Bands and Points Breakdowns in 2024

Band (meters)	Contacts				Points			
	CW	FT8	SSB	GOTA	CW	FT8	SSB	GOTA
80	496	204	387	57	932	408	387	57
40	1211	292	1709	160	2422	584	1709	160
20	1213	533	1423	216	2426	1066	1423	216
15	834	334	925	259	1255	688	925	259
10	8		235	3	16		235	3
5		83				166		
2		23				45		
Totals	3532	1469	4679	695	7964	2938	4679	695

2025 Simulated Emergency Test

The annual ARRL SET will be October 4 – 5, 2025.

Steve Ewald, WV1X, ARRL Field Organization Supervisor

The annual ARRL Simulated Emergency Test (SET) is coming up, and 2025 marks the 90th year of the Amateur Radio Emergency Service® (ARES®). Also, last year was the 75th anniversary of the start of the National Traffic System (NTS) as we know it today. ARES and NTS are central to ARRL's emergency service and public service outreach. What better way to carry on this long-standing tradition than by participating in the SET?

Although October 4 – 5 is the primary weekend for this year's national emergency exercise, ARRL Field Organization leaders may be planning an exercise in your community or ARRL Section on a different date. That's encouraged to enable as many amateur radio operators and groups as possible to participate and benefit from this training event. This annual nationwide exercise presents an important opportunity to test one's training and develop new skills.

Working Together

The SET invites all amateur radio operators to become better aware of emergency preparedness and the training that is available. ARES, the Radio Amateur Civil Emergency Service (RACES), NTS, SKYWARN®, the Community Emergency Response Team (CERT), The Salvation Army Team Emergency Radio Network (SATERN), and other auxiliary communications groups and public service-oriented radio amateurs are encouraged to participate.

For decades, ARRL has established working national relationships with organizations and agencies such as the Federal Emergency Management Agency (FEMA), the American Red Cross, The Salvation Army, the National Weather Service, the National Communications System, the Association of Public-Safety Communications Officials-International (APCO-International), Citizen Corps, National Voluntary Organizations Active in Disaster (NVOAD), REACT International, Inc., the Society of Broadcast Engineers (SBE), and the Boy Scouts of America. More details about these organizations and how they work with ARRL and amateur radio operators can be found at www.arrl.org/served-agencies-and-partners.



Rick Rinehimer, K3TOW, an Assistant Emergency Coordinator for the Luzerne County ARES in Eastern Pennsylvania, operating from the Luzerne County EOC during the 2024 SET. [NASA/Joy Ng, photo]

Getting Involved

To find out how to get involved in this year's SET, please contact your local ARRL Emergency Coordinator or Net Manager. Local clubs are also a source of information on who is active within the ARRL Field Organization. In addition, the ARRL Section web pages at www.arrl.org/groups/sections can provide helpful contact information, as can your ARRL Section Manager.

SET guidelines can be found at www.arrl.org/simulated-emergency-test. If you are an ARRL Emergency Coordinator, Net Manager, or Section leader in charge of reporting this year's SET activity on behalf of your group, please fill out the online SET reporting forms at <https://ares.arrl.org/areset>.

Update to 2024 ARES SET Results

The following reports should have appeared in the table of results for the 2024 SET Results in the July 2025 issue of *QST*:

- Monroe County Amateur Radio Public Service Corps, reported by Emergency Coordinator Lance Charter, KE8BYC, achieved 700 points. These added points raise the Michigan Section to second place in the "2024 SET Top Ten" and "ARES Activity" lists and give Monroe County the second-highest ARES Activity score in the country for the 2024 SET.
- The Badger Emergency Net, reported by Net Manager Kristine Batka, NX9K, achieved 475 points during two SET net sessions.

These additions have been made to the digital edition.

2025 ARRL International DX Phone Contest Results

This year's ARRL International DX Phone Contest was held March 1 – 2, 2025. The next ARRL International DX Phone Contest will be held March 7 – 8, 2026.

As the last qualifying opportunity for the World Radio-sport Team Competition (WRTC) of 2026, testers enjoyed mostly good conditions, productive upper bands, and great overall competition as participants once again joined in the annual DX contest, where worldwide stations work North America and North American stations compete to operate the DX of the world.

Conditions

Band conditions can greatly enhance the experience in amateur radio contests. This year's DX SSB Contest benefited from such conditions, resulting in interesting and sometimes unexpected outcomes.

Although there were some reports of unsettled conditions, overall the bands were great, and it's clear from the scores that good conditions drove many operators to the upper bands, producing large QSO totals on the 10-, 15-, and 20-meter bands and providing a good opportunity for WRTC qualifying point generation.

Participation

There were 4,646 log submissions this year, a decrease of about 500 from last year. The numbers are nearly equal to those from 2023, while still benefiting from improved solar conditions.

Youth Operator Overlay

The Youth Overlay allows younger operators to showcase their talents, and this year was no exception. Levi, K6JO, took his opportunity to operate the ZF1A station on Grand Cayman to another level, not only winning the Youth Overlay, but also the Single Operator, High Power DX category overall!

Another significant youth score came from Europe; Jules, F4IEY, produced a multi-mega point score as a single operator as TM1A at the F6KOP contest station, in pursuit of qualifying points for the 2026 WRTC.

Logs Received by Year	
2025	4,646
2024	5,193
2023	4,844
2022	3,976
2021	3,737
2020	3,527

"A huge thank you, as always, to all of the mults that tried to move for me,

even if we didn't work. I really appreciate you," said Levi, Youth Category and Single Operator, High Power DX winner.

With operators like these two, the future of contesting is indeed bright! Do you know a younger ham interested in contesting? Help them get on the air and enter the Overlay category.

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.

Youth Overlay Scores — US and Canada

Call	Score
Single Operator, High Power	
AB1MM	64,176
KQ2X	20,274
KK7UXY	4,830
W7ASU*	432
Single Operator, Low Power	
KQ4VQV	15,642
KC3WWP*	8,640
KB4ABM	1,425
KC1VPU	672
W4WSV*	630
Single Operator, Low Power, 10 Meters	
KR4AXO*	3,276
KQ4RCC (N1GNF, op)*	510
KJ5JJP*	147
Single Operator, QRP, 20 Meters	
KE2DZM*	90
Single Operator, Unlimited, High Power	
W7YJ	72,369
KC3WTS	44,550
KC1SDD	35,190
Single Operator, Unlimited, High Power, 10 Meters	
WY3P (W4IPC, op)	295,740
KD3ABP @K3NEM	3
Single Operator, Unlimited, Low Power	
K4VBL	38,250
W9NAA	37,260
K18AN*	33,672
KF0QFD*	18,042
AC3JR*	11,832
W3BRL	3,060
KF0QNO	624
Single Operator, Unlimited, Low Power, 10 Meters	
KE2EGF*	7,056

* Limited Antenna Overlay

Top Ten — US and Canada

Call	Score	Call	Score	Call	Score	Call	Score
Single Operator, High Power		Single Operator Unlimited, High Power, 80 Meters		Single Operator Unlimited, QRP, 20 Meters		Single Operator, QRP, 10 Meters	
K1LZ (LZ5DB, op)	6,084,432	N6RO	13,986	K4CNY	90	W7USA	15,594
K5TR	4,232,490	N4PSE	8,256	Single Operator, High Power, 15 Meters		WA3LXD	14,076
N2IC	4,115,988	AC8Y	6,642	N7RQ	268,086	K9JK	13,800
K4AB	3,433,986	N7GCO	672	KE8FT	139,908	VE9QR	10,044
XL3A (VE3AT, op)	3,081,540	K3FZT	75	KC8ZMN	24,552	K8ELS	6,696
N5ZO (@WA6TQT)	2,912,640	Single Operator, High Power, 40 Meters		N3MWQ	23,976	N6AN	3,750
K5GN	1,695,390	K6IRF	14,592	N1CGP	15,912	VE2ZQ	2,520
K8GL	1,608,000	WD0BGZ	9,933	KG9Y	10,074	W3XR	2,016
W0EWD	1,350,846	N7RK	9,225	N9TCA	7,680	N3CZ	585
NA8V	1,336,608	W4WWQ	8,541	KR3DX	6,045	AF9J	270
Single Operator, Low Power		W5CPO	3,441	W7TX	2,967	Single Operator Unlimited, High Power, 10 Meters	
N1UR	3,479,196	KK7DP	1,518	AB5AA	2,418	VE3EJ	688,086
N8II	1,615,890	Single Operator, Low Power, 40 Meters		Single Operator, Low Power, 15 Meters		VA2WA	667,008
AC0W	1,279,224	W7BJN	28,875	W1QK	149,574	K2SSS	550,494
AD5A	1,103,130	VE3ZV	16,524	N7MGW	102,168	KW7MM	511,560
KW0A	848,844	N8KR	16,065	VE3FH	38,214	KV0Q	469,908
KF8N	688,536	W9RN	5,670	AA6MU	36,693	W2FU	440,955
VE2HIT	546,336	KF2Y	3,840	N4LS	21,924	K1JB	386,496
KF5VDX	475,398	KJ5ISI	120	W3FA	20,193	W04O	374,088
WA2AEY	431,028	W9CTY	48	N7VGO	13,596	W6YI	337,311
WB4JFS	426,000	VE3CW	75	VY2LI	13,464	WY3P (W4IPC, op)	295,740
Single Operator, QRP		Single Operator Unlimited, High Power, 40 Meters		WA5ZKO	12,972	Single Operator Unlimited, Low Power, 10 Meters	
ND0C	389,610	VY2TT	37,758	N9HDE	10,944	W9XT	263,268
W6QU (W8QZA, op)	127,323	KG1E	24,168	Single Operator, QRP, 15 Meters		K1EP	238,182
AC2N	54,054	WV4E	7,749	K3TW	40,986	WF7T	237,600
K2YG	22,707	KE6GFI	6,216	KC3WCB	23,085	NE8P	196,980
N7JI	10,146	AB5KM	900	VE3BFU	10,032	KB1EFS	129,402
WR4I	7,590	VA3HY	663	N2US	4,752	KO3ZDE	57,159
W7LG	5,733	Single Operator Unlimited, Low Power, 40 Meters		Single Operator Unlimited, High Power, 15 Meters		KH7X/W7 (KH6ND, op)	44,916
AK0M	3,813	N3AC	15,912	K3ZU	552,240	N9VPV	35,136
N7ECV	2,550	N3BNA	13,530	N2PP	487,692	WU8T	31,671
Single Operator Unlimited, High Power		W4GDV	5,304	N6WM	368,202	AC8CE	30,504
K5ZD	5,880,336	AA4GA	1,575	N1LN	258,324	Single Operator Unlimited, QRP, 10 Meters	
AA3B	5,204,082	N8URE	1,428	W6AFA	221,796	KA7T	2,496
AA4NC (N4YDU, op)	4,072,536	Single Operator, High Power, 20 Meters		NM4AA (WA1BXY, op)	118,065	Multioperator, Single Transmitter, High Power	
K1RX	4,045,284	W1AVK	150,147	VE5ZX	103,878	N2NT	5,169,018
N3RS	3,957,261	KC9OP	41,610	W4ANT	35,802	K9RS	5,139,060
W4NF	3,920,022	W4JKC	26,727	W8TJM	31,872	N2SR	4,809,222
W1NT	3,856,704	NU5DE (N5KF, op)	22,656	VA6MA	31,212	W4RM	4,198,752
WK1O	3,745,062	W8GOC	19,323	Single Operator Unlimited, Low Power, 15 Meters		K4OV	3,655,068
W1GD	3,629,499	WE9N	6,273	N9TGR	130,290	K3ND	3,433,626
AB3CX	3,353,028	KJ4LWN	3,813	W0WAB	38,880	WW4LL	3,240,315
Single Operator Unlimited, Low Power		N6XI	3,150	AB1J	24,522	KQ3F	3,137,112
WV4P	2,006,145	VE6CA	90	WX2N	20,496	WA2CP	2,629,224
KK1L	1,883,007	Single Operator, Low Power, 20 Meters		W0BF	16,854	K3JO	2,481,600
K1XM	1,691,496	K5RX	100,320	N6ORB	7,455	Multioperator, Single Transmitter, Low Power	
WE9R	1,651,500	NG3Q	60,009	KC7H	1,581	N4SS	2,701,650
ND4Y	1,328,580	N4ZXZ	20,355	N8IK	1,170	W1HQ	1,561,911
WJ1U	1,213,281	K5XDD	7,752	KQ4MHE	1,083	WA1F	936,183
W3KB	1,093,440	NG2S	5,472	Single Operator Unlimited, QRP, 15 Meters		N1RM	828,738
K1H	1,081,590	N1ECT	2,250	K2GMY	3,828	W3ZGD	691,260
KS1J	965,520	W3LJC	2,079	Single Operator, High Power, 10 Meters		N8YXR	623,070
AB1EP	893,730	KF0AIT	1,386	WA3A	605,172	KT4XA	478,140
Single Operator Unlimited, QRP		KB9LCD	1,197	K1DG	604,998	K1WAS	335,490
KA8SMA	177,855	KE8ZZQ	594	N1PGA	543,510	W0FLN	317,631
W4WKU	139,464	Single Operator, QRP, 20 Meters		N4OX	447,663	W1WQM	127,512
N0UR	136,998	KE2DZM	90	N2ZN	307,230	Multioperator, Two Transmitter	
WQ6X	102,144	Single Operator Unlimited, High Power, 20 Meters		ND8DX	186,228	W3LPL	10,378,485
NO5V	27,090	KB3WD	456,924	K8NVR	119,004	K9CT	6,526,620
VE3GMZ	2,520	W1RCR	243,936	N5IT	108,120	N2AA	6,273,927
Single Operator, High Power, 160 Meters		KT4R	190,500	K5FK	88,911	W2XX	5,075,865
K1ZM	8,643	WX5S	95,616	K3ISH	78,078	K8AZ	4,112,262
N4XD	5,250	K7MS	69,471	Single Operator, Low Power, 10 Meters		K2AX	3,967,674
VE3PN	2,025	WA4JUK	56,643	K4TMC	97,440	N7DX	3,947,535
Single Operator Unlimited, High Power, 160 Meters		N9LQ	8,520	VE3YZ	81,672	WG3J	2,948,310
K5UR	3,534	W7GES	960	N1WRK	80,850	K8LX	2,651,040
Single Operator, High Power, 80 Meters		Single Operator Unlimited, Low Power, 20 Meters		W9ILY	75,840	W2CG	2,239,569
W3BGN	29,880	K9RO	95,718	WA7BNM	70,917	Multioperator, Multitransmitter	
W1HI	17,820	N4IJ	62,832	N3ATQ	69,996	K3LR	16,364,640
W6RKC	1,782	VE2SS	15,288	K3HW	50,820	K1TTT	9,310,092
K2AF	912	KI9DX	11,907	N3RN	46,872	N3RD	5,046,300
Single Operator, Low Power, 80 Meters		VE2NTT	9,000	KA8Q	43,776	AA1K	4,750,956
WB2FKO	12,054	KQ4AHO	8,580	WA1ONB	37,332	K1KI	3,677,400
KJ4EX	7,503	AA4ZZ	2,400			K1KP	2,484,972
KU4BP	6,273	KE2CRB	2,352			WA3EKL	1,327,068
N7AU	3,120	AG6JA	1,881			WA2DNI	1,229,016
WB2AMU	2,958					W2ZJ	158,814
WZ6ZZ	288						

Top Ten — DX

Call	Score	Call	Score	Call	Score	Call	Score
Single Operator, High Power				Single Operator Unlimited, Low Power, 20 Meters			
ZF1A (K6JO, op)	8,150,268	IB8A (I8QLS, op)	192,618	YV5WL	89,265	XE1KK	119,886
8P5A	7,647,120	IB9A (IT9RBW, op)	182,799	PY1KV	69,597	E9ACD	109,611
HK1T	6,674,184	R7NW	140,616	ME5W (M0HMJ, op)	59,400	HK3LRB (HJ3DMH, op)	107,559
TO4A (VE3DZ, op)	6,247,164	OM7K (OM7RU, op)	67,539	T2WMP	53,583	Single Operator, QRP, 10 Meters	
WH7T (WH7W, op)	5,500,656	LZ2AO	47,196	H3MPC	8,160	JQ1BGT	19,665
CR6K (CT1CJJ, op)	4,956,336	YV4ABR	23,760	CT7ABG	4,956	LZ6E	18,270
KH6J (E77DX, op)	4,235,760	XE1OGG	13,608	IP9A	4,875	T3GB	6,720
E17M (E16JK, op)	3,662,835	XQ3SA	2,052	CE5PR	4,134	JK1CNL	4,575
KP4PR	3,380,076	YF8RSH	1,872	US0YW	2,580	DL5EC	4,464
EA5DFV	2,699,766	OK5D (OK1DTP, op)	819	EA3HAB	2,451	JA2MWV	4,212
Single Operator, Low Power				Single Operator, High Power, 15 Meters			
HI3T	2,727,936	Single Operator, Low Power, 40 Meters		CR6T (CT1ESV, op)	402,675	F8AKC	4,116
CO8ZZ	2,404,044	HJ3ESF	45,900	PX2A (PY2PT, op)	392,718	G8LNR	3,654
S52NR	1,402,632	HK1J	38,808	OM5R (OM5DX, op)	271,389	IU2OQK	1,008
PY2NY	1,081,080	DS5TOS	1,683	OG8M	257,115	PU4BOT	1,008
T2OY	939,870	YB8RAG	690	F6ARC	249,798	Single Operator Unlimited, High Power, 10 Meters	
UZ7C (UT9CZ, op)	857,601	JR8QFG	456	E77EA	234,525	PT5J (PP5JR, op)	600,057
IO3T (IK3QAR, op)	827,412	YB7OHT	408	SN5X (SP5GRM, op)	224,541	CR3W (DK7YY, op)	460,977
LY4L	673,506	YC5LCZ	273	EA5S	190,275	TM6M (F4DXW, op)	422,499
NP4ET	554,826	JH1RDU	198	GM5X (GM4YXI, op)	182,664	TM1C (F4ARU, op)	386,214
C6ACK (WE9V, op)	538,464	YD0NHG	189	HG0Y (HA7GN, op)	156,831	TM0T (F4HQZ, op)	379,842
Single Operator, QRP				Single Operator, Low Power, 15 Meters			
DK5DQ	108,237	Single Operator, QRP, 40 Meters		KP4NZ (KP4PUA, op)	233,280	9A3TR	340,740
I23NVR	104,052	JR1ABS	312	HG0R (HA0NAR, op)	87,210	I19P (I28JAI, op)	326,700
JH1OGC	46,197	Single Operator Unlimited, High Power, 40 Meters		PY2QT	80,352	F4GGQ	305,820
JH7UJU	34,656	9A7V	200,274	SP1NQH	79,632	HA5JI	294,408
EA1CBX	14,406	S51YI	195,552	F4EIH	61,308	EI3JZ	293,760
IU0OXQ	6,048	PY5QW	90,630	G7D (G3XTZ, op)	32,688	Single Operator Unlimited, Low Power, 10 Meters	
HA5BA	4,557	OM4WM	81,120	YV5IAL	27,456	PY2EX	228,861
F1LED	2,277	JH7MQD	65,943	OK2BZE	12,543	924Y	210,453
ED1P	2,046	HA7A	61,335	XE2N	9,282	TM1W (F1HAR, op)	184,788
JR1NKN	1,665	UW5ZM	40,656	EA3KT	9,180	ED1R (EA4AOC, op)	167,040
Single Operator Unlimited, High Power				Single Operator, QRP, 15 Meters			
P49Y (AE6Y, op)	6,790,254	G4VMM	17,214	JR4DAH	7,200	LU2PWY	152,703
CR3Z (EW6W, op)	6,285,048	JA2GTW	12,540	DO3OI	360	PU1JSV	114,576
T11K (T15CDA, op)	4,982,220	UW7LL	882	J11AEP	231	PY2HT	105,840
KP3J (N2TTA, op)	4,461,210	Single Operator Unlimited, Low Power, 40 Meters		JA1KPF	198	IB2M	101,094
I12C (IK2JUB, op)	3,626,964	HK3EA	113,988	F4ANS	60	PY2XC	85,800
ED3X	3,462,732	I4AVG	25,671	IU1QZX	60	SV2AEL	78,312
TM1K (F5USK, op)	3,320,880	T12LCO	17,760	JK1VBA	36	Single Operator Unlimited, QRP, 10 Meters	
NP2X (K9VV, op)	3,219,195	OM/UT2WW	8,496	JE2QHK	6	EE3O (EA3O, op)	42,075
RW1F	2,945,130	FSNLY	900	JJ1VFA	3	CB3R (XQ3SK, op)	7,776
OM2ADM	2,727,342	OE1KDK	780	Single Operator Unlimited, High Power, 15 Meters		PU7EFV	3,780
Single Operator Unlimited, Low Power				T15VMJ	400,860	PW2W (PY2ZA, op)	2,736
VP9I	3,548,448	JR2WLQ	198	S50K	313,479	OE1XRW (OE1OPW, op)	1,248
5K4X	2,762,361	RU0LL	144	OM4MM	291,648	MOXAR	75
ZF2VE (W1VE, op)	2,360,841	YE8DWC	12	ED2X (EA2LMI, op)	289,689	Multipoperator, Single Transmitter, High Power	
4M5A (YV5RAB, op)	1,544,790	OE1VMC	6	ED7W (EA7X, op)	287,493	CQ8M	4,525,428
I18K (I28EPX, op)	1,131,582	Single Operator Unlimited, QRP, 40 Meters		SN3A (SP3GEM, op)	285,138	IO5O	4,315,338
ED3Z (EA3DZ, op)	1,121,544	T15FSP	1,995	V55Y (V51WH, op)	224,436	TO3Z	4,178,472
HA3NU	1,007,328	JH3DMQ	180	IQ9RG (IT9EQQ, op)	212,580	4A7S	3,850,902
PY2UD	968,184	Single Operator, High Power, 20 Meters		S50R	210,084	OK5Z	3,239,649
CT7BJG	875,520	OH8L (OH8LQ, op)	191,880	9A8M	181,719	C8ANM	3,106,950
HI8PAP	570,000	EA3CI	160,776	Single Operator Unlimited, Low Power, 15 Meters		SP8R	3,022,044
Single Operator Unlimited, QRP				PZ5TW (PY8VWV, op)	184,098	HI3LT	2,939,247
KH7M (N7IR, op)	360,636	CB3A (XQ3SK, op)	109,269	PY2VZ	136,290	SJ2W	2,366,334
PC2F	15,000	RA9V	99,792	EA6MR	67,554	IB1D	2,320,290
7N4WVPY	4,941	SP9RCL	84,588	ON6NL	37,779	Multipoperator, Single Transmitter, Low Power	
IU4JJP	924	CX6TU	79,818	SP9XCN	33,885	VP5M	5,547,618
PG2AA	504	SN1G (SP1DSZ, op)	42,780	LY5GT	27,900	NP4DX	3,919,608
Single Operator, High Power, 160 Meters				SV1BJW	12,051	IO6T	1,890,030
S56X	1,776	4I1EAY	32,760	EA5ASM	11,766	LU2WJV	861,732
UA7K	24	PY2MM	29,025	DO1OTW	11,025	ON6BR	495,198
Single Operator, Low Power, 160 Meters				DK9BM	5,655	PY2RH	359,778
HA0NAR	75	RZ9YN	7,029	OE1OPW	5,655	DQ5T	161,766
Single Operator Unlimited, High Power, 160 Meters				Single Operator Unlimited, QRP, 15 Meters		3Z1K	99,498
KP4AA	18,315	CT3IQ	65,331	HG1S (HA1DAE, op)	25,578	8N7YUA	14,445
E18X (E15KF, op)	216	CE4JZO	31,311	JK1TCV	1,440	9A0HRS	11,232
Single Operator, High Power, 80 Meters				SQ6MIH	1,296	Multipoperator, Two Transmitter	
S57UN	63,468	DL4VAI	7,290	RA5W	612	PJ4G	11,433,744
3F3RRC (R1BIG, op)	13,800	CT2JBD	6,804	Single Operator, High Power, 10 Meters		J62K	10,275,846
T32AZ	10,296	HK4DMD	5,106	D4K (I24DPD, op)	759,267	HC8M	8,217,279
YO9AYN	693	E74FRS	2,451	KP2B (EB7DX, op)	469,260	ED8W	7,689,660
JE2OTM	72	SP4SAF	1,995	LT3E (LU3VMS, op)	393,660	J75A	6,826,890
JH8FIH	60	HK6M	1,428	PY2MZ	361,242	IP4X	6,645,873
CT1BWU	27	PY1KB	1,404	PP5FB	355,062	I12S	5,419,464
Single Operator, Low Power, 80 Meters				E70T	335,592	E19E	3,297,660
XE2OK	4,056	SP2GTJ	1,050	S55OO	306,741	RL3A	3,245,232
YO8WW	264	Single Operator, QRP, 20 Meters		CE3CT (N5NU, op)	282,576	YT9X	3,003,780
JE1SPY	135	F5BEG	8,811	YT1X	265,350	Multipoperator, Multitransmitter	
Single Operator, QRP, 80 Meters				EC5K	197,886	PJ2T	11,303,235
JH1APZ	60	UA9KBC	72	Single Operator, Low Power, 10 Meters		9A1A	6,448,296
Single Operator Unlimited, High Power, 80 Meters				WP4TZ	304,440	9A1P	6,169,284
HA1TJ	61,965	CO2XN	295,944	T1E	205,674	JA3YBK	2,446,815
ED4W	3,975	HG5E (HA1AH, op)	282,735	CO8RH	169,614	IO3F	683,712
		IQ9UI (I4UFH, op)	280,014	9Z4CT	155,781	OM5M	435,810
		TH1T	273,996	LW2DHD	146,034	PY3EW	332,442
		YT1A	251,991	CN8PA	129,447	DK0HF	321,090
		RA9Y	152,280	T12KI	128,421	VL4A	104,004
		OZ1ADL	123,192			9M2J	23,814
		DH1TT	114,741				
		F8DVD	109,200				
		SV1JG	84,975				

Sponsored Plaque Winners

Plaque Category	Winner	Plaque Sponsor
CW Winners		
W/VE Single Operator High Power CW	N2NT	Frankford Radio Club
W/VE Single Operator Low Power CW	K0EJ	The CW Operators' Club
W/VE Multioperator Single Transmitter High Power CW	W2FU	The CW Operators' Club
W/VE Multioperator Two Transmitter CW	K1LZ	The CW Operators' Club
W/VE Single Operator High Power 3.5 MHz CW	W3BGN	The CW Operators' Club
W/VE Single Operator High Power 14 MHz CW	KC9OP	The CW Operators' Club
World Single Operator Low Power CW	KP2B (NP4Z, op)	The CW Operators' Club
World Single Operator High Power CW	TO4A (VE3DZ, op)	Tom Georgens, 8P5A/W2SC
World Single Operator QRP CW	YV5KG	The CW Operators' Club
World Single Operator Unlimited, High Power CW	II2Q (IK2PFL, op)	The CW Operators' Club
World Single Operator Unlimited, Low Power CW	WP3C (N2TTA, op)	The CW Operators' Club
World Multioperator Two Transmitter CW	ED8X	Frankford Radio Club, K2TD, Memorial
World Single Operator High Power 7 MHz CW	MW4R (GW4XUM, op)	The CW Operators' Club
North America Single Operator Low Power CW	KP2B (NP4Z, op)	Fred Hoffert, NA2U
North America Multioperator Single Transmitter CW	ZF1A	The CW Operators' Club
North America Multioperator Unlimited CW	ZF5T	The CW Operators' Club
Central Division Single Operator Low Power CW	N9XX	Society of Midwest Contesters
Central Division Single Operator Unlimited, High Power CW	WM9C	Society of Midwest Contesters
Central Division Single Operator Unlimited, Low Power CW	WE9R	Society of Midwest Contesters
Pacific Division Single Operator Unlimited, Low Power CW	W7TR (KH2TJ, op)	The Big Gun Contest Club, W2AA
Pacific Division Single Operator Unlimited, Low Power 40 Meters CW	W2XX	The Big Gun Contest Club, W2AA
Hudson Division Single Operator Unlimited, Low Power CW	WA2JQK	Hudson Valley Contesters and DXers — In memory of K2ONP
Africa Single Operator CW	CR3DX (OM3GI, op)	The CW Operators' Club
Asia Single Operator High Power CW	JE6RPM (JH5GHM, op)	The CW Operators' Club
Asia Multioperator Single Transmitter High Power CW	JH4UYB	Yankee Clipper Contest Club
Caribbean Single Operator Low Power CW	KP2B (NP4Z, op)	Frankford Radio Club, 9Y4VU, Memorial
Europe Single Operator QRP CW	DK7HA	The CW Operators' Club
Europe Single Operator Unlimited, High Power CW	II2Q (IK2PFL, op)	The CW Operators' Club
Europe Multioperator Single Transmitter CW	EA5RS	The CW Operators' Club
Japan Multioperator Unlimited CW	JA3YBK	Masahiro Kitagawa, JH3PRR/KH8B/M0ITU
Europe Multioperator Two Transmitter CW	ED7W	The CW Operators' Club
Japan Single Operator Low Power CW	JA1BJI	The CW Operators' Club
Oceania Single Operator CW	WH7T (WH7W, op)	The CW Operators' Club
South America Single Operator CW	3G2AID (XQ3SK, op)	The CW Operators' Club
CW/Phone Combination Winners		
W/VE Single Operator Low Power Combined Score	N8II	Ellen White, W1YL, Memorial — ARRL Contest Branch
W/VE Youth Overall Winner	W0AAE	Frankford Radio Club, W2OX, Memorial
Phone Winners		
W/VE Single Operator High Power	K1LZ (LZ5DB, op)	Frankford Radio Club
W/VE Single Operator Unlimited, Low Power	WV4P	Swamp Fox Contest Group — In memory of Marc Tarplee, N4UFP
World Single Operator High Power	ZF1A (K6JQ, op)	Tom Georgens, 8P5A/W2SC
World Single Operator Low Power	H13T	Arizona Outlaws Contest Club
World Single Operator Unlimited, High Power	P49Y (AE6Y, op)	Charles Dietz, W5PR
Central Division Single Operator High Power	KD9MS	Society of Midwest Contesters
Central Division Single Operator Low Power	AA9D	Society of Midwest Contesters
Central Division Single Operator Unlimited, High Power	WM9C	Society of Midwest Contesters
Central Division Single Operator Unlimited, Low Power	WE9R	Society of Midwest Contesters
Great Lakes Division Single Operator Unlimited, Low Power	ND4Y	Kentucky Contest Group
Asia Multioperator Single Transmitter, High Power	JH4UYB	Yankee Clipper Contest Club
Japan Multioperator Unlimited	JA3YBK	Masahiro Kitagawa, JH3PRR/KH8B/M0ITU
Oceania Single Operator High Power 3.5 MHz	T32AZ	Burton M. Parmeter, KG7MD, Memorial Award

Youth Overlay Scores — DX

Call	Score	Call	Score
Single Operator, High Power			
ZF1A (K6JQ, op)	8,150,268	OM2ADM	2,727,342
UW5Y (UR5YKO, op)	1,573,443	TM1A (F4IEY, op)	2,083,686
NJ4MX/KH6	143,355	DM7XX	1,338,732
Single Operator, High Power, 40 Meters			
YF8RSH	1,872	BA6KC	2,508
Single Operator, Low Power			
JG1ZUY (JJ1AHS, op)	232,065	9A/S56NE	2,304
R7KCV	16,170	SQ2RAD	1,134
IV3KNU*	14,553	Single Operator Unlimited, High Power, 10 Meters	
IV3CTS (YU4BIR, op)	3,978	E7Y (E75OM, op)	57,918
DL4XT	3,441	9A2L (9A3CLW, op)	21,360
JM8UJU	360	9A/OK2SCR	10,656
YO3LNU*	351	Single Operator Unlimited, Low Power	
HF6UWU	264	YO8OLY	55,080
S59ACA	144	DA6VW	40,896
S54DC	48	DL3ON	17,316
DL1DJH	27	DA6NEN	13,200
S56CJ	18	S56AS	11,448
Single Operator, Low Power, 10 Meters			
YU1JA	90	BY7SH	858
Single Operator, Low Power, 15 Meters			
YO3GRU	1,275	S57DEV	168
YO3ZHR	741	HA4NI*	126
XE2DL*	12	Single Operator Unlimited, Low Power, 10 Meters	
		HA4EL*	4,224
		LU1XOP*	270
		LW2DJG	126
		S54LB	72
		Single Operator Unlimited, Low Power, 15 Meters	
		B13XGJ*	12

* Limited Antenna Overlay

Happenings

Amateur Radio Volunteers Serve During Texas Floods

As of press time, volunteer amateur radio operators serving in the Amateur Radio Emergency Service® (ARES®) are embedded with local served agencies in the areas of central Texas affected by devastating floods.

The needs and assignments have been changing, but ARES volunteers are stepping up to the dynamic needs of their communities. "This is a very fluid situation. It changes by the hour," said ARRL South Texas Section District 7 Emergency Coordinator Terry Jones, K5LGV.

The trained ham radio operators were activated on July 4, 2025. Radio amateurs are providing communications capabilities to agencies whose primary systems were damaged in the flooding event, or where they suffer poor connectivity due to the terrain.

ARES members helped the American Red Cross with setting up a reunification shelter in response to the floods. Ten hams were assigned to search-and-rescue teams.

Dozens of health and welfare messages were passed by ham radio operators who provided a critical link when phone lines were overwhelmed. "A lot of this is tied to circuit overload preventing folks from making direct contact with family members in the area," said Kevin McCoy, KF5FUZ.

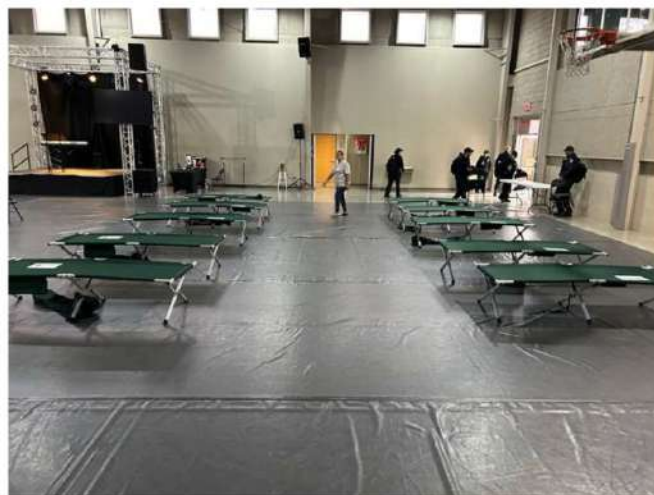
US Radio Orienteering Champs Crowned

The 24th USA Radio Orienteering Championships were held on June 19 – 22, 2025. The event was hosted by the Backwoods Orienteering Klub (BOK) at Morrow Mountain State Park in Albemarle, North Carolina, and it drew about 30 athletes from across the US and Canada. Radio orienteering is also known as Amateur Radio Direction Finding, or ARDF.

There were four World Championship-style races: Foxoring, Sprint, 2-meter Classic, and 80-meter Classic.

Elite Results

- Eduard Nasybulin (Massachusetts), unofficial overall crown, dominated the men's field, winning



Cots set up by ham radio volunteers at an American Red Cross shelter at the Calvary Temple Church in Kerrville, Texas.

During the flooding event and subsequent search and recovery missions, ARES members have been deployed to serve many different counties, including hard-hit Kerr and Kendall Counties. Mutual aid has been offered between several surrounding ARRL Sections.

This story will be updated on the ARRL website (www.arrrl.org/news/amateur-radio-volunteers-serving-during-texas-floods) as new information is confirmed.

Sprint, 2-meter and 80-meter Classics, and adding silver in Foxoring.

- Gheorghe Fala (North Carolina/BOK) seized Foxoring gold and finished second to Nasybulin in 2-meter and 80-meter Classics.
- In W35 (women ages 35 and older), Lori Huberman (Bay Area Orienteering Club) captured Foxoring and Sprint, while Erin Hammer (North Carolina/BOK) sprinted to 2-meter and 80-meter Classics gold and added silver in the other formats.

Masters Standouts

- Nadia Scharlau, KO4ADV (North Carolina/BOK), extended her W55 (women ages 55 and older) legacy with victories in both 2-meter and 80-meter Classics.
- The M60 class (men ages 60 and older) became a two-way battle; Evgeny Danilov, KQ4QYZ, and Nicolai Mejevoi traded wins and podium spots across all four events, with Mejevoi topping the Sprint and 80-meter Classic races while Danilov took 2-meter Classic and Foxoring gold.

Senior Competitors

Every entrant in the M70 (men ages 70 and older) and W75 (women ages 75 and older) divisions completed at least three of the four demanding courses. Their steady performances — and obvious enjoyment — underscored the value of adding senior categories to future championships.

Youth Sweep

BOK junior Tiger Zhao claimed a perfect four-event sweep in M16 (men ages 16 and under), and teammates Anastasia Afonkin (W16; women ages 16 and under) and Adalia Schafrath-Craig (W19; women ages 19 and under) also took golds — some with times that would have placed competitively in older divisions.

Hams Report Fire; Helicopter Crew Extinguishes Just in Time

With the help of amateur radio operators, a potential wildfire was averted in California on June 12. Some hams wound up in the right place at the right time while preparing to participate in the 2025 ARRL June VHF Contest.

Robert “Bobby” Debevec, W6IWN, and Jacob T. “Jake” Graham, KC7WXD, both ARRL members from the Reno, Nevada, area, were hiking on the Grouse Ridge Trail in California, a section of the Tahoe National Forest. In addition to getting ready for the contest, they had hoped to activate several Summits on the Air locations. Their day of using the Amateur Radio Service for recreation was going well, until they saw smoke near the Black Buttes area and had to use it for its utility value.

Debevec captured the event on video and posted it to his YouTube channel (www.youtube.com/watch?v=b-_ydtQfgOw). “I was surprised to see smoke ahead of us,” said Graham. “As we got closer, it was clear there had been a lightning hit several days ago, and we could also see flames,” he added.



Sprint champions at the 24th USA Radio Orienteering Championships awards ceremony (left to right): Ruth Bromer, WB4QZG; Joseph Huberman, K5JGH; Eduard Nasybulin, William Allen, Jonathan Kross, and Lori Huberman. [Gheorghe Fala photo]

Team USA will go on to compete at the 2025 International Amateur Radio Union World ARDF Championships, to be held in Lithuania in August. The complete results of these championships, available at the BOK website (www.backwoodsok.org/twenty-fourth-usa-radio-orienteering-championships-bulletin-two), will be used for selecting the US team. Learn more about ARDF at www.arrl.org/amateur-radio-direction-finding.

Wireless service is spotty in portions of the eastern Sierra, and they didn't have a cell signal, so Debevec used his handheld to report the fire on a nearby repeater. Within seconds, Dan Patterson, W6AI, responded. He was monitoring the Nevada County Amateur Radio Club linked repeater system in Grass Valley, California, when he heard the call. He took the GPS coordinates from Graham and notified the US Forest Service.

“We were monitoring the US Forest Service, and it took only about 10 minutes for them to dispatch a helicopter to the area,” said Graham. He continued, “We watched four firefighters rappel, followed by a pack of equipment.” The pair then walked closer to the area and started talking to the crew, who thanked them for the report.

“They put out the fires, but radioed for a helicopter water drop before they left on foot, with the gear, to a nearby pickup site,” said Debevec.

After the firefighters left, the winds picked up dramatically. Had that happened earlier, the outcome could have been much worse. Amateur radio serves commu-

nities before as well as When All Else Fails®, and having a thriving group of trained, active operators

2025 ARRL Field Day a Success

Tens of thousands of hams are celebrating a successful 2025 ARRL Field Day. The largest annual amateur radio event is also one of the most beloved, as shown by countless social media posts (www.facebook.com/media/set/?set=a.1151177510377895&type=3). Activity was high, with 1,536 sites in the ARRL Field Day Station Locator — not including home stations, portable operations, or other participants.

“There’s a reason that hams look forward to ARRL Field Day,” said ARRL Public Relations and Outreach Manager Sierra Harrop, W5DX. “It is easy to see how much fun people have during the event. Across the country, people come together in town squares, public parks, green spaces, and other locations — all to celebrate the joy of amateur radio and to share it with others,” she said.

On the town green in West Brookfield, Massachusetts, between Springfield and Worcester, the Quaboag Valley Amateur Radio Club held its activation front and center in the postcard town. There was a steady line of onlookers visiting the setup that stretched out for several hundred yards. Many of them sat down to try their hand at the Get on the Air station. Nestled across from an antique church with a white steeple, and on green grass that surrounds a fountain, the hams brought a steady call of “CQ Field Day” to the quiet hamlet.

Aboard the International Space Station, Astronaut Jonny Kim, KJ5HKP, was active. Social media and YouTube show several clips of hams talking with Kim.

allowed amateur radio to facilitate emergency communications that saved the day.

James Walker, KC1UYZ, shared a video of his contact with Kim to Instagram and other platforms. “KC1UYZ, welcome to the International Space Station,” said Kim. The rest of the contact was followed by enthusiastic whoops from Walker, who was elated to have talked with an orbiting astronaut.

W1AW, the Hiram Percy Maxim Memorial Station at ARRL Headquarters in Newington, Connecticut, was active for the event. The station’s three operating studios were configured as a 6F-class station. Starting Saturday afternoon and going well into the night, ARRL Education and Learning Support Specialist Max Freedman, N4ML, was operating alongside Audrey McElroy, KM4BUN. “It is always great to help people get W1AW in their logs,” he said. Freedman is an experienced contester, but this was his first operating event at the historic station. “It is such an honor to operate as W1AW,” he said.

McElroy was honored as the Bill Pasternak, WA6ITF, Memorial Amateur Radio Newsline Young Ham of the Year in 2022. She’s in Connecticut for an internship in support of her electrical engineering degree — a career that her ham radio background has inspired.

As of press time, ARRL Contest Program Manager Paul Bourque, N1SFE, reported that nearly 2,500 entries have already been received via the online entry form at <https://field-day.arrl.org/fdentry.php>.

More information about ARRL Field Day is available at www.arrl.org/FieldDay.



Audrey McElroy, KM4BUN (left); Max Freedman, N4ML (center); Joe Garcia, NJ1Q (right), and Liz Karpiej, KA1DTU (far right), operating as W1AW for 2025 ARRL Field Day.

Public Service

Net Gains: Tips From, and For, the Field

Recruiting new members for local Amateur Radio Emergency Service® (ARES®) and other nets can be challenging. This month, we'll make a few suggestions for remedies, starting with the protocols of the net control station (NCS).

First, in my experience, the NCS tends to conduct the net by mimicking the style of a public safety dispatcher — formal, cold, and concerned about efficiency. And that's fine; it's been part of the culture of net operation for decades. That's the style that I, and countless others, have employed for years. Why not? It makes us sound like the pros we work with.

There is another style that works very well, however: easygoing, low-key, warm, friendly, and with humor. This style is in evidence every week in the net control station run by Fred Lewis, KO4YOL, of the rural Gilchrist County (Florida) ARES Net. In conducting the net, Fred's voice conveys warmth, excitement, fun, and appreciation as he checks in members on the net roster. The net always has a great turnout, and a lot of that success is due to Fred's effervescent style. Try it!

Give Basic Signal Reports to Increase Check-Ins

Another effective protocol is NCSs giving check-in stations a quick, rough signal report. For a local

FM repeater net, for example, the NCS could say, "WB1GEX, you're DFQ" (dead full quieting), or "W9ZZC, you're 50% quieting," etc. On an HF net, a quick report to each check-in might be something like, "AB1N, you're S-9." The NCS could even add something like, "Nice signal today, Joe!" What station operator doesn't want to know the qualities of their signal? I submit that this protocol would be a great way to gain and keep new net members.

Contesters Make Good Net Control Stations

During the ARES forum at the Dayton Hamvention® in May, ARRL Director of Emergency Management Josh Johnston, KE5MHV, noted that contesters make good net control stations and suggested that net managers recruit them. Johnston also recommended community outreach for coordination with and recruitment of General Mobile Radio Service (GMRS) and Family Radio Service (FRS) radio operators, especially those connected with Community Emergency Response Teams (CERTs; www.fema.gov/cert). GMRS and FRS operators are excellent candidates for amateur service licenses, ARES, and nets.

With this strategy, Polk County, Florida, ARES® expanded its ranks and boosted amateur radio operators' participation.

"By engaging our local CERTs with fostering collaboration and demonstrating the unique capabilities of amateur radio, we've tapped into a gold mine of enthusiastic new recruits," says Christine Duez, K4KJN, ARRL Public Information Coordinator for the county's ARES group. "Showcasing the advanced opportunities found in amateur radio, we've established a positive and mutually beneficial relationship with CERT groups that primarily use GMRS."

Monitor Repeater Input Frequencies

Mike Hasselbeck, WB2FKO, of Alachua County, Florida, reminds us that almost every modern VHF FM transceiver has a monitor button that lets an operator listen to the input channel of a repeater. For example, the input frequency for Gainesville's 146.820 MHz repeater is 146.220 MHz, corresponding to the standard 600 kHz offset. If you can hear stations on the input, you'll likely be able to contact them via simplex.



Fred Lewis, KO4YOL, left, and Mike Shaffer, KD4INH, at the helm of the amateur station at the Gilchrist County, Florida, EOC. [Rick Palm, K1CE, photo]

Hasselbeck installed a new mast at his home station that doubled the height of his VHF/UHF FM vertical dual-band antenna, from approximately 15 feet to 30 feet. "This has increased my ability to hit distant repeaters but also extended my simplex range to area stations," helpful in an emergency when power and repeaters go down, he explained. "During a recent evening's ARES net, I used the monitor button to see who I could hear direct. I was able to copy 13 calls on the repeater input channel."

The line-of-sight distance to the horizon will improve as the antenna height increases. Other factors include the curvature of the earth, obstructions in the path, and absorption by foliage at VHF+ frequencies, of course. One can also expect seasonal, daily, and even hourly variations due to the changing refractive index in the troposphere.

Prepping for Event Communications Duty: The Keys to Success

Erik Westgard, NY9D, Minnesota's Assistant Section Emergency Coordinator for Events and veteran public event (e.g., bicycle races) communications specialist, offers a few basic tips for hams working a race event. Wear the correct event attire: Official-issued, day-of-race T-shirts must be worn. For the public's interest, be able to answer a question or two about the event, including its purpose, the course, and the mission statement. Recognize your role as a cheerful, positive part of the event management team.

Westgard urges communicators to know and follow the event's chain of command and have a basic understanding of the Incident Command System (ICS) — take FEMA's online IS-100 course (<https://training.fema.gov/is>). Be able to program your radio to the issued ICS-205 frequency plan, but also be prepared to use other services' radios without complaint. Have directed net check-in experience and ideally NCS experience.

Follow the event rules for volunteers, sign up as a radio operator using the correct volunteer website, and sign any reasonable disclaimers. Be willing to perform other duties as assigned (e.g., setting up tables, carrying boxes of snacks, assisting medics, etc.). At a recent event, sponsor volunteers, general volunteers, and hams helped set up the water stop, and one was picked as acting medic lead until the medics arrived.

Have a basic familiarity with first aid and triage. Does the situation look serious? Event coordinators usually

have an emergency plan and procedures — read them. Take a CERT class for light medical, CPR, and first aid certifications. The Red Cross, local hospitals, police and fire departments, and community colleges offer relevant courses.

Ham volunteers should refrain from using land mobile, ICS, and other radio jargon. Use plain language. Don't lecture event leadership — you are there to solve problems, not create them. If it feels like you are delivering a hard sales pitch on Winlink, NVIS antennas, or FCC Part 97, stop.

When approaching event management staff who have never employed amateur radio volunteers, it's best to first join the team as general day-of-race volunteers. The Course Marshall position is a good starting point; usually, your job is to keep an eye on your assigned part of the course for safety, logistics, and other issues. Develop relationships — if you have recent first aid training, see if the medical department will take you in. Be the best community volunteer ever, and see if there are unmet needs where our interests and skill sets can apply. And, if you are providing communications, be self-sufficient; the Race Director/Incident Commander is not your concierge.

NCS Management Programs

Ward Silver, NØAX, discovered several popular packages used by net control operators to keep track of net business. Here are a few:

- Net Control Manager (NCM): <https://net-control.us>
- NetLogger: www.netlogger.org
- N3FJP Net Manager: www.n3fjp.com/otherprograms.html
- ECARS Logger: www.ecars7255.com/FrontPageLinks/NetManagement/Logging/Logging.htm
- W3KM Net Control: <https://qsl.net/w3km/PRNet.htm>

See QST in Depth for More!

Visit www.arrl.org/qst-in-depth for the following supplementary materials and updates:

- ✓ Sample ICS-205 Communications Plan

Club Station

The Evolution of Ham Radio Clubs

Ham radio has been a fundamental part of global communications for more than a century, bridging gaps between people and fostering a unique community bound by a passion for radio technology. Over time, clubs dedicated to ham radio have adapted to the latest trends, technologies, and societal shifts.

The Early Years

The first-known club is thought to be the Junior Wireless Club of New York, founded in 1909. To keep up with technological advancements in the 1910s and 1920s, hams began forming local clubs to share knowledge, exchange signals, and build homebrew transmitters. These early groups played a vital role in shaping amateur radio regulations and fostering interest in technical education, as ham radio was still a developing technology. Because early radios were hand-built spark-gap devices, there was a need for the government to develop standards to ensure interoperability. Few universities taught the technology of radio, so clubs acted as incubators for ideas and inventions.

By the 1930s and 1940s, ham radio clubs became structured organizations formed to standardize practices and represent operators. Clubhouses were meeting points for hams to discuss antenna designs, transmission protocols, and licensing requirements. ARRL became a cornerstone of ham radio advocacy, helping to coordinate emergency communications and pushing for legislation favorable to amateur radio operators. In 1935, ARRL formed the Amateur Radio Emergency Service® (ARES®), a volunteer group of hams dedicated to providing emergency communications support.

World War II marked a pivotal moment for ham radio clubs. Most communications during the war were conducted via CW, and many hams were active in military operations and communications roles. Post-war, these operators returned home and shared their advanced education. Over time, clubs implemented this knowledge and established emergency communications groups (in addition to ARES) that could assist during disasters and public service events.



Club members gather for regular meetings to share news and ideas. Some gather in person, while others choose to do so virtually. [Scott Yonally, N8SY, photo]

Manufacturer Influences

After World War II, the market for new radios grew, especially among returning veterans. Hand-built tube radios with open-chassis construction slowly gave way to circuit boards and smaller, more complicated builds.

While factory-built radios were already available, kits began being advertised. Companies like Heathkit, Knight, and others made it possible for someone with only basic electronics skills, and the willingness to learn and follow directions, to build their own station. This encouraged the development of local groups and clubs being formed around building kits and using the equipment they assembled. Clubs sprang up as experienced builders helped newbies get started. Meetings for building and testing equipment were held to help operators get on the air.

As newer types of equipment came on the market and the availability of easier-to-purchase radios became more prominent, youth groups like Scouting America and schools formed amateur radio clubs without the need to build equipment. Clubs could be created by someone with basic radio knowledge, such as a teacher or Scout leader. Kits like the HeathKit HW-8, a QRP radio that could be easily transported to camp and operated on batteries, were within reach for many operators.

Clubs with Special Interests

Clubs also began to be built around specific aspects of the hobby. Some formed around radiosport, while others became centered around emergency communications and tended to be associated with local and state organizations, like the American Red Cross, hospitals, police departments, and fire companies. Ham radio was quickly recognized for its ability to be deployable and versatile in emergency situations.

The development and commercial availability of newer forms of communication, like VHF and UHF FM, brought a new group into the mix. The introduction of repeaters cultivated new clubs with a focus on repeater function and use. These clubs saw a major increase in the early '90s, due to the elimination of needing to send Morse code to get licensed. Many new hams had privileges above 30 MHz, and the use of mobile and handheld VHF and UHF radios jumped.

Growing with Changing Technology

Numerous new clubs were formed well into the '60s and '70s. Many were formed in schools, and local clubs consisted of operators with varying levels of experience. The late 20th century saw a rise in digital and internet-based communications, diminishing the necessity of traditional radio-based conversations. Cellular telephones were becoming prevalent, and the incorporation of internet applications (many of which had chat and messaging features already available) seemed to diminish newer generations' interests in radio. Some feared ham radio clubs would fade into history, but the advent of digital modes, like packet radios, PSK31, and software-defined radios (SDRs) reinvigorated curiosity. Clubs adapted by embracing innovative technologies, shifting their focus toward digital experimentation and engaging the new generations growing up among them.

Clubs have formed special interest groups focused on Raspberry Pi hardware and software, digital-mode experimentation, and satellite communications, among others. Digital modes have introduced ham radio to a new generation of operators that no longer have to sit in front of a microphone or a key, but instead their computer screen — or even their phone — and still operate the ham bands.

While there will likely always be an interest in CW and single sideband for some, clubs are beginning to embrace new digital modes, like FT8, FT4, Digital Mobile Radio (DMR), Fusion, and D-STAR and are devoting more time to learning what it takes to use them. Winlink and VARA have also grown in recent

years. This doesn't mean that voice and CW are forgotten, but adding access to these modes invites interest from new operators, especially younger ones who have grown up around modern computer systems.

Technological advancements haven't only affected operating modes and equipment; the days of having a formal meeting following *Robert's Rules of Order* is of little interest to young hams. Now, many meetings take place on Zoom, updates come through Discord, and, for many clubs, Facebook has replaced a traditional newsletter.

Clubs of Today

In the 21st century, ham radio clubs remain a vital part of the amateur radio ecosystem. Despite facing challenges, they've shown resilience, continuously progressing while preserving the essence of amateur radio. Whether coordinating emergency communications, experimenting with innovative technology, or chatting locally or across continents, they remain vibrant communities that embody the spirit of curiosity and camaraderie.

If you're looking to join a ham radio club, visit www.arrl.org/find-a-club to find one in your area.

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 June 20, 2025.



Renewing SSCs

South Texas ARC, N5CRP
DuPage ARC, W9DUP
St. Cloud Radio Club, W0SV
Ozaukee Radio Club, W9CQO

Corpus Christi, TX
Clarendon Hills, IL
Waite Park, MN
Cedarburg, WI

New SSCs

Azalea Coast ARC, AC4RC
St. Charles ARC, WB0HSI

Wilmington, NC
St. Charles MO

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.

Ham Media Playlist

Q5 Worldwide Ham Radio

If you do a quick search on YouTube for “ham radio,” you will be inundated with results. There is no doubt there are a lot of content creators, each with their own feel and format. One format you won’t find a lot of is that of Kevin Thomas, W1DED, on his channel, Q5 Worldwide Ham Radio. Kevin uploads content in a variety of formats for ease of watching, listening, and reading.

Kevin was introduced to amateur radio by his father. He fondly recalls watching him build a Heathkit HW-101, witnessing every stage of the project, from assembly, to antenna construction, then to hearing voices from around the world. This was enough to encourage Kevin to earn his license and quickly upgrade to the Advanced class.

Kevin points out that, while his father was his first mentor, he was far from his only one. Kevin was introduced to the local ham radio club in Aroostook County, Maine. It was there that Kevin, the youngest member of the club by far, was not only mentored but also given opportunities to grow and create. In addition to being encouraged to give club presentations, Kevin quickly took on the task of creating and printing the club newsletter. This club’s encouragement gave Kevin a sense of belonging, a feeling that remained with him after he headed off to college.

Storytelling and Ham Radio

Kevin has always loved telling a story, having started in 1978 with that club newsletter. Several years later, Kevin found himself with an expired license and went through the process of getting relicensed. After doing so, he began reaching out to hams to seek advice. It didn’t take too many conversations with fellow hams before it dawned on him that he should record these discussions. Kevin was in a good position to begin doing so quickly, as he had a full podcast studio in his home for his business.

Q5 Worldwide Ham Radio found success early on, with viewers genuinely enjoying the format and production quality. As the channel began to grow, Kevin started delving more deeply into areas that interested him, such as Parks on the Air and contesting. He began reaching out to prominent hams in these areas. As he had conversations with these radio amateurs,

Kevin found that his pool of potential people to talk to was growing rapidly through suggestions given by his guests. Kevin quickly found that his channel, which started as W1DED Worldwide Ham Radio, needed to undergo a transformation. This gave birth to the current channel, Q5 Worldwide Ham Radio. When asked why he changed the name, Kevin pointed out that it became obvious that the channel was about far more than just one call sign — it was about a community.

Notable Videos

One video that stands out is part of Kevin’s “Contest Crew” series, which focuses on conversations with different people from the contesting community. The video titled “Contest Crew Europe Debuts on Q5 Worldwide Ham Radio” (<https://tinyurl.com/q5-europe>) features a group of six European testers, the result of Kevin’s realization that most of the hams he talked to were North America-centric. Kevin described the opportunity to have all of these accomplished testers on one call as “a true honor.”

Another standout video on Q5 Worldwide Ham Radio is titled “Inside the Epic CY9C St. Paul Island Ham Radio DXpedition: Craig Thompson K9CT” (<https://tinyurl.com/Q5-K9CT>). The fact that Kevin was able to conduct an interview with Craig Thompson while he was on a DXpedition was in and of itself amazing. Hearing from Craig in almost real time about the DXpedition was a rarity. Watching Craig talk, sitting in a shelter with the wind noise, watching the walls move as a result, made viewers feel like they were there with K9CT.



Kevin, W1DED, welcomed some of the best testers in Europe to his channel to discuss all things contesting.



Kevin, W1DED, welcomed Craig Thompson, K9CT, from St. Paul Island. Craig gave viewers an almost real-time look at what goes on during a DXpedition.

Finally, Kevin's video titled "DX Marathon Youth Champion: Pia DL7PIA's Story Will Inspire You!" (<https://tinyurl.com/Q5-Pia>) hits close to my heart. Pia, who was first licensed at the age of 12, is an 18-year-old amateur radio operator in Germany. In this video, Pia discusses how making her first contact inspired her to pursue a license that would let her operate in the amateur bands without frequency restrictions. Having the opportunity to hear from young people about what interests them in amateur radio is always a pleasure, and Kevin and Pia do a wonderful job of explaining her interests and answering people's questions about how amateur radio is special compared to just using a cell phone.



Kevin, W1DED, interviewed Pia, DL7PIA, as she explained what drew her to amateur radio.



Kevin, W1DED, also produces his content in written form, available for free on his website.

A Variety of Media Formats

Kevin understands that people like to consume content in a variety of ways. In addition to posting his videos to YouTube, Kevin also exports them for podcast listening. What sets Q5 Worldwide Ham Radio apart from so many other channels is the fact that Kevin takes the time to produce content in writing. This content, found on Substack, is incredibly well written and produced. It's effort like this that makes it clear that Q5 Worldwide Ham Radio is about telling the stories of ham radio to the world. Links to Kevin's other platforms for his content can be found at www.q5hamradio.com.

Whether you are looking for something to watch and learn about contesting, something to listen to on your daily commute, or something to absorb quietly through the written word, Q5 Worldwide Ham Radio has something for everyone.

Strays

Ham Presents at Conference

Moshe Satt, N2YU, a computer science PhD candidate at NYU Tandon School of Engineering, wrote a research paper on detecting hidden GPS trackers and the limitations of current detection methods, which was accepted for presentation at a major cybersecurity conference. The technology was recently featured on CBS News New York. The video can be found at www.youtube.com/watch?v=uBRsGCqBWAg.

How's DX?

3YØK: February 2026 DXpedition to Bouvet Island

In this month's column, 3YØK team leader Kenneth Opskar, LA7GIA, announces an upcoming return to the DX community's 11th most-wanted entity.

Bouvet Island — often referred to as the most isolated island in the world — is again the focal point of one of the most ambitious DXpeditions in amateur radio history, which is set to take place in February 2026. Known for its extreme conditions, unforgiving weather, and logistical nightmares, Bouvet presents unique challenges that have made previous DXpeditions struggle.

This 3YØK DXpedition to Bouvet is being conducted by an international team of 20 operators who have the necessary permits to go ashore. The team is determined to stay on the island for 14 days, with an additional week reserved for weather contingencies. With four members having previous experience on Bouvet, the team feels well prepared for the journey.

The budget for 3YØK is approximately \$1,650,000, making it the most expensive DXpedition ever. Recognizing that the amateur radio community could not rely on a traditional funding model for such a large undertaking, the team spent 6 months evaluating different concepts for sharing the cost. We looked into teaming up with other groups, such as film and tour companies and governmental agencies, but these efforts all fell short. Eventually, I connected with a small, private group that shared interest in going to Bouvet. The group includes members of the April 2025 SpaceX Fram2 mission, in which they became the first humans launched into polar orbit. These astronauts, with their dedication and generosity, will be great partners for this mission to activate Bouvet Island again in 2026.

The funding model was designed not only to share the cost with other groups, but to mount a large team of operators who will each contribute a significant fee to make this DXpedition happen.

Logistics and Transportation

Transporting operators and equipment to Bouvet Island is a complex logistical effort that requires dedication and attention to detail. At the heart of the project is

Icetugs, a service with ice-class vessels capable of navigating the treacherous Southern Ocean. Designed specifically to operate in Arctic and Antarctic conditions, Icetugs will ensure that supplies, radio equipment, and personnel arrive safely onshore. The team has secured a contract with clauses that protect against delays and unforeseen events and allow for extending the trip duration if needed. Icetugs specializes in expedition support, camp setup, rescue, tugging, cargo transport, and more. They have a diverse portfolio of contracts and are expanding their fleet with more vessels.

While Bouvet's shores and unpredictable surf make landings difficult, Ultimate Aviation's helicopters have highly skilled and qualified pilots. The pilots, who have been nominated as key personnel for 3YØK, have more than 35 years of experience in military and police operations, sea rescue, trooping, and specialized private expeditions. They have extensive experience in sling-and-hoist and boat-to-shore operations, and in extreme polar conditions, they can conduct critical airlift operations to ensure safe transport to the island's rugged terrain. Ultimate Aviation has operated in Antarctica for more than 10 years, and their pilots have experience with islands like Marion, Gough, and Tristan da Cunha.

Our logistics include contingency planning for weather and other unexpected events. What we learned from the last Bouvet operation is that its weather is highly



3YØK team members practicing tent setup at their preparatory workshop in Oslo, Norway, in May 2025. [Kenneth Opskar, LA7GIA, photo]

unpredictable. This makes it difficult to make firm plans, so our ability to quickly adapt to changing conditions will make a huge impact. A robust expedition support company will assist us with landing essentials and setting up camp facilities, such as tents and provisions. We have also engaged two specialized companies with emergency response and evacuation experience in polar climates. By partnering with external experts, our team is going the extra mile to secure the success and safety of the DXpedition.

Additional Supporters and On-Island Setup

Our highly skilled and experienced international team plans to set up a single camp with two operating tents. We aim to set up eight stations with amplifiers — four in each tent — including a setup that allows for in-band operation on 30 – 10 meters, due to the distance between the radio tents and antennas. The tents will be separated by about 500 meters, with one at Bouvet's Cape Fie, and the other at a plateau with better takeoff to North America. Our approach will be flexible to adapt to potential shorter weather windows. Despite us sharing the cost with the private group, they have generously agreed that setting up the 3Y0K camp will have priority over their activities.

Icom is supporting us with IC-7610 radios, while ACOM is supplying different solid-state amplifier models. We envision a high-power setup with dedicated 20-meter-tall verticals for 160 meters to ensure strong top-band signals, as well as receive antennas. We will prioritize 160 meters, but we also hope our activity between sunrise and sunset will pay off for our dedicated low-band operators. For the higher bands, the plan is to set up high-gain monoband Yagis custom-made for Bouvet; these are lightweight, yet high-strength antennas. The setup includes three elements on 20 meters, four elements on 15 meters, and five elements on 10 meters. For 17 – 12 meters, we'll have a two- or three-element dual-band Yagi.

DX Engineering, which always supports our DXpeditions, will once again provide radios for satellite and VHF operating, coaxial cables, antennas, and other accessories. Ranko Boca, 4O3A, will supply all of the necessary filters for the two setups. With so many operators, the team will focus on CW and SSB, but we will also be present on FT8 on all bands from 160 to 10 meters, as well as QO-100.



A shipping container arriving in Oslo, which will be used for 3Y0K equipment. [Kenneth Opskar, LA7GIA, photo]

Like last time, we will be using first-class Norwegian winter-rated tents. The main tent will be an Arctic Lavvo design, the same one that withstood 60-knot storms during the previous Bouvet DXpedition. We'll also bring smaller emergency tents sponsored by Norwegian company Barents Outdoor AS. These tents have been successfully tested during 21-year-old Karen Kylesø's record-breaking ski trek to the South Pole.

Plans in Motion

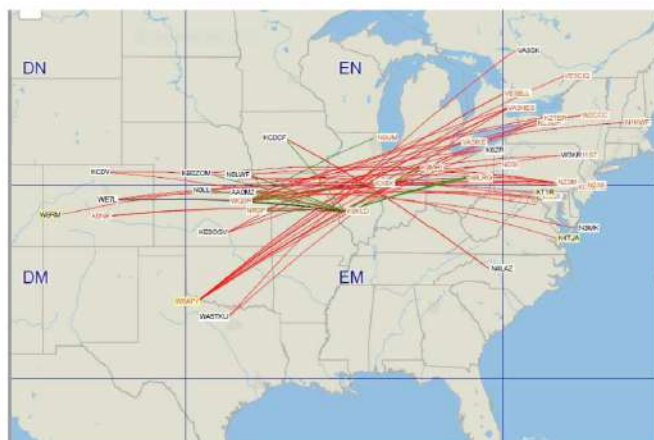
We're not going to Bouvet without a Plan B and C — be assured that our team will do what we can to go ashore, even in difficult conditions. We have a flexible setup and adaptable skills, and despite our determination, we know that this is going to be a challenging DXpedition. Our passion is for the benefit of the DX community, so please wish us luck on our trip to Bouvet! For more details about 3Y0K 2026, visit our website at www.3y0k.com.

The World Above 50 MHz

Summer 2025 Sporadic E and Rare Grid Activations

June is usually the peak month for sporadic-E propagation in the Northern Hemisphere. But, day after day this past June, stations noted few or limited E_s openings on 6 meters. Several grids were activated for the Fred Fish Memorial Award, but the activators reported minimal contacts. Robert, ZL1RS, went to call sign regions E6 and YJØ, and he made few contacts to North America. The ARRL Field Day weekend was a bust for sporadic E; openings were scarce on 6 meters, and there wasn't much activity for 10 and 15 meters. June had only a couple of good days for E_s overall.

Several factors can explain this outcome. Sporadic E has year-to-year variation, but this is also the peak of Solar Cycle 25, meaning a more active geomagnetic field. High solar flux does not affect sporadic E much. However, the geomagnetic field does affect sporadic E. The geomagnetic field was highly active in June, with many days featuring a K index of more than 4 — these were the days with the least amount of sporadic E. An active geomagnetic field may cause sporadic E in some instances, such as aurora E_s, although it dampens it most of the time. Both 2020 and 2021 were great years for sporadic E. They coincided with the bottom of Solar Cycle 24, and the geomagnetic field was mostly quiet at that time. The geomagnetic field tends to be more active on the downward turn of a solar cycle peak, so sporadic E may be mediocre in 2026 as well.



A DX Maps screenshot depicting the 2-meter E_s on July 4, 2025. [www.dxmaps.com]

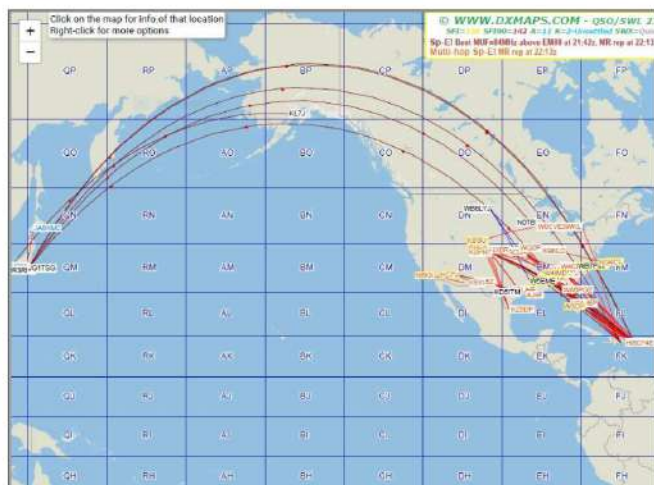
June ARRL VHF Contest 2-Meter Sporadic E

Some of the rarest types of ionospheric propagation are 144 and 222 MHz sporadic E. Finding an E_s cloud with a maximum usable frequency greater than 144 MHz can be daunting. In 2024, there were no reports of 2-meter sporadic-E openings. In the evening on June 14, during the ARRL June VHF Contest, there was heightened activity on 6 meters, and sporadic E appeared on 2 meters. On June 15, Larry Trumble, AEØG (EN10), worked AA4ZZ (EM96) on 2-meter SSB at 0056 UTC. Randy Wing, NØLD, was operating from grid EM24. He worked KD2LGZ (FN13), N2OA (FN03), KB8CR (EM79), and W3KR (FN11) on FT8. Sam Whitley, K5SW (EM25), worked K8RYU (EM99), K2KV (FN20), and K4RTS (FM08) on SSB. On FT8, Ron Todd, K3FR (FM18), worked KCØIJH (EM17) at 0049 UTC with his indoor Yagi.

More 2-meter sporadic E occurred on July 4. This opening started early in the morning for Larry Lambert, NØLL (EM09). Larry said:

I was alerted early in the opening by [KA9CFD's] post in the ON4KST chat. I just happened to look there, and the 2-meter band wasn't open here yet. I worked 43 2-meter E_s contacts on FT8. The 2-meter band had E_s off and on from 1344Z to 1824Z. The longest contact was [between] N1KWF (FN32) and K1TEO (FN31). N3MK (FM27) sneaked into the log — so did Delaware. It was a July 4th to remember.

The opening had two waves; the first one started at around 1340 UTC and dropped out after 2 hours, and then it came back at 1645 UTC for another 2 hours. Greg Cerny, WQØP (EM19), caught the second wave. Lou Eckert, KT1R, worked NØLL (EM09), WYØV (EN12), WAØQHJ (EN00), AAØMZ (EM29), KCØCF (EN32), NIØP (EN00), NRØP (EM28), NØPB (EM39), WZ9W (EM39), NØKQY (DM98), WQØP (EM19), NØLWF (EN10), WØLGQ (EN21), and W9RM (DM58). The best DX on this list was a distance of 2,575 kilometers. I saw that KCØV (DN70) worked K4TJA (FM17) from 2,476 kilometers away, and K1HTV (FM18) reported a signal from W9RM from 2,602 kilometers away. These contacts are more than the usual limit for single-hop sporadic E (which is typically 2,200 kilometers), but less than the usual limit for double-hop



A DX Maps screenshot depicting the July 2, 2025, opening to Japan experienced by Jose Montes, KP4EIT. [www.dxmaps.com]

sporadic E. Perhaps this was the result of chordal hop. Ron Klimas, WZ1V (FN31), worked NRØP (EM28).

John, WA2FZW (FN20), was in on the opening and worked NØLL, two stations in Nebraska (for a new state), and Missouri. Sam Whitley's, K5SW (EM25), best DX was K1BX (FN43) in New Hampshire via SSB. He heard VE2FUT/B on 144.280 MHz during the opening. This beacon runs 5 W to an M² Antenna Systems halo antenna. Rich, K1HTV (FM18), logged stations in Kansas and Colorado, and he heard but didn't work KØNR (DM78) and KØBJ (DM99).

N7PHY, K5ND, and Others Activate Rare Grids

Ed Sershon, N7PHY, ventured to grid DN16 for Independence Day weekend, and he made many contacts. His signal was +14 dB for me at 1545 UTC. Robert, W5AJ, went to DM70 and DM71 on June 29. He said, "Conditions were poor...really poor." Jim, K5ND, was in DM85 on July 3. He had a huge signal to the Midwest at around 1615 UTC. WR7X/P popped up from DN05 that same day, and AG6EE put DM18 on the air on July 5. During ARRL Field Day, KM7W was active from DN56. Jeff, WB8LYJ, was on a long rover trip and operated from grids in South Dakota, including EN04, DN95, and DN96. WA2FZW (FN20) worked Jeff on 2-meter meteor scatter from three new grids. Tyler, N5UC, operated maritime mobile from EL58, but he experienced bad weather and poor propagation until July 3. He worked Mike Downing, KCØY (EM17), and others.

On the Bands

50 MHz. On June 5, Larry, W1DYJ (FN42), had Europe in to his location. Rich, K1HTV, had good condi-

tions toward Africa and Europe during the June VHF Contest. He worked three stations in call sign region EA8, 32 stations in Europe, and SØ1WS. On June 16, Jim, KC7QY (DM64), worked EA8DBM with a three-element Yagi. On June 18, Hector Garcia, AD6D (DM22), copied OD5KU and stations in Russia, and he worked UB7K. Mike Greenway, K4PI, noted some "strange propagation" on June 19. He said:

Starting at around 13:15 GMT, we also started seeing UN prefixes. It seems that over the last few years, [for] a day or two around the solstice, we hear UN. But this day, I heard eight of them! I worked seven, [including] four new grids, if I can get them confirmed. They had good signals, but heavy QSB.

K1HTV worked UN3G and UN3GX. He later copied RA3CQ sending a report to 4U1UN. John Lock, KFØM (EM17), and KCØY both worked UT2XQ. Trey Garlough, N5KO, said, "We have been getting openings to JA lately on some nights, at around 0600Z – 0700Z." On June 25, Bill, K1CT (DM12), worked JA7QVI with 50 W and a trap vertical antenna. The next day, KCØY copied six stations in Alaska and worked KL1R. I saw Jose Montes, KP4EIT (FK68), work JA1QJI (QM05) at 2151 UTC on July 2.

On July 4, Rich, K1HTV, worked 11 stations in Spain, along with stations in regions IT9, HB, F, and EA6. He also worked N7PHY (DN16) and K5ND (DM85). Fred Honnold, NO5Z (DM62), had good conditions toward Europe; he worked stations in France and England, and he copied LA7AJA and an operator in UT8. Fred noted that he went to 50.323 MHz, where stateside noise was less intense. On July 5, I, NØJK, received KL7SB (BP40) at 0253 UTC and worked VE7KDU (CO54) at 0350 UTC on FT8. Alex Nersesian, K6VHF/HR9, said his station in Honduras is now almost completely remote, and he hopes to frequently monitor and operate on 6 meters.

144 MHz. Greg Cerny, WQØP (EM19), worked IW4ARD, OK1UGA, PAØV, S51ZO, and IK4WLV via Earth-moon-Earth on June 28, with a single 17-element Yagi.

Here and There

Mike Crownover, AD5A, worked Rhode Island for his last state for the 6-meter Worked All States Award. Rhode Island is considered a rare state. Some call signs to watch for include KI1U, K1DT, and N1WVQ (SSB only).

Hasan, NØAN, has written an informative guide on using Q65 mode at https://drive.google.com/file/d/10bnMqpiQ2w89Vqbak_7_Q9_SmlBJpWZt/view?usp=sharing.

Special Event Stations

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

Aug. 1 – Aug. 31, 0000Z – 2359Z, 4A2MAX, Neosho, Mexico. San Max Celebration Team. **San Max SP3RN SK 2025**. 7.175 14.175 21.275 28.450. Certificate & QSL. Jose de Jesus Lopez V., 5914 San Bernardo Ave., Suite 4-135, Laredo, TX 78041-2506. www.qrz.com/db/4a2max

Aug. 16, 1400Z – 1700Z, W0CXX, Cedar Rapids, IA. Collins Amateur Radio Club. **Celebrating Gene Senti's Birthday**. 14.263. QSL. Brice AntonJensen, 1110 Lyndhurst Dr., Hiawatha, IA 52233. w0cxx.kb4sby@gmail.com or www.w0cxx.us

Aug 24 – Sep. 6, 0000Z – 2359Z, K9A, Auburn, IN. North-eastern Indiana Amateur Radio Association. **Auburn Cord Duesenberg Festival Special Event Station**. 7.180 14.250 28.360. Certificate* & QSL. K9A – NIARA, P.O. Box 145, Auburn, IN 46706. *No Logbook of The World or eQSL*. www.w9ou.org

Aug. 30 – Sep. 1, 1600Z – 1600Z, K7RDG, Sierra Vista, AZ. Cochise Amateur Radio Association. **Return to Paradise 47th Anniversary**. 3.890 7.225 14.070 14.285; voice/FT8/FT4/JS8. Certificate & QSL. Cochise ARA, P.O. Box 1855, Sierra Vista, AZ 85636-1855. www.k7rdg.org

Sep. 1 – Sep. 10, 0000Z – 2359Z, K6S, Monterey, CA. Monterey DX Group. **175th Anniversary of California Statehood, 1850 – 2025**. 7.275 14.275 21.275 28.375. QSL. G. Costello, WC6DX, P.O. Box 1332, Monterey, CA 93942-1332. *No Logbook of The World or e-QSL*.

Sep. 2 – Sep. 14, 1400Z – 2359Z, W2V, Gastonia, NC. Radio Gastonia. **80th Anniversary of Victory Over Japan Day**. 7.245 14.345 18.145 21.345. QSL. W2V VJ Day SE Radio Gastonia, 243 Moore Dr., Gastonia, NC 28056. www.qrz.com/db/w2v

Sep. 5 – Sep. 7, 2100Z – 2100Z, W0EQO/W0ZSW, Minneapolis, MN. Handiham Radio Club and Handiham Radio Club of Minnesota. **Handiham Radio Camp 2025 and Handiham Program's 58th Anniversary**. 7.200 14.050 14.250 28.350. QSL. Handiham Program, 3915 Golden Valley Rd., MR 78446, Minneapolis, MN 55422. *QSO Party during Radio Camp. Individual call signs will also be used*. www.handiham.org

Sep. 6 – Sep. 7, 1200Z – 2359Z daily, W7O, Birmingham, AL. N4GHP. **70th Anniversary of the Birmingham Zoo**. 7.290 7.296 14.296. Certificate & QSL. Lloyd Palmer, 1325 Windsor Ct., Alabaster, AL 35007. www.qrz.com/db/n4ghp

Sep. 6 – Sep. 12, 0000Z – 2359Z, K4A, Cordova, AL. Alabama Contest Group. **K4A 9-11 We Do Remember**. 7.040 14.250; 60 through 10 meters, including WARC bands; all modes SSB, FT8, CW, and RTTY. Certificate.* Robert Beaudoin, 970 Mountain View Rd., Cordova, AL 35550. www.alabamacontestgroup.org

Sep. 6 – Sep. 14, 0000Z – 2359Z, W6H, Rio Rancho, NM. Albuquerque DX Association. **Route 66 On the Air**. 3.866 7.266 14.033 14.266. QSL. Bill Mader, 4701 Sombrette Rd. SE, Rio Rancho, NM 87124. www.qrz.com/db/w6h

Sep. 6 – Sep. 14, 0001Z – 2359Z, W6JBT, San Bernardino, CA. Citrus Belt Amateur Radio Club. **Route 66 On the Air**. 3.866 7.266 14.266 28.466. Certificate & QSL. Citrus Belt Amateur Radio Club, P.O. Box 3788, San Bernardino, CA 92413. *There will be multiple stations (including rovers) operating in or around the major cities along Route 66 from Santa Monica, California to Chicago, Illinois*. www.w6jbt.org

Sep. 7, 1100Z – 1600Z, N1N, Loris, SC. The Intercontinental Amateur Traffic Net. **INTERCON, Celebrating 65 Years of Service**. 14.295 14.305 (monitoring plus or minus 5 kHz of 14.300). QSL. eQSL will be sent via email to all logged contacts. www.interconnet.us

Sep. 13, 1330Z – 2100Z, K3S, Port of Baltimore. Nuclear Ship *Savannah* Amateur Radio Club. **Baltimore Defender's Day**. 7, 14, 18, 21, 28. QSL. Ullis Fleming, 980 Patuxent Rd., Odenton, MD 21113. Check spotting networks. www.qrz.com/db/k3s

Sep. 13, 1400Z – 1700Z, W0CXX, Cedar Rapids, IA. Collins Amateur Radio Club. **Celebrating Arthur Collins' Birthday**. 14.263. QSL. Brice AntonJensen, 1110 Lyndhurst Dr., Hiawatha, IA 52233. www.qrz.com/db/w0cxx

Sep. 13, 1400Z – 2000Z, KS0LV, Leavenworth, KS. Pilot Knob Amateur Radio Club. **Fred Harvey House Museum on the Air**. 14.053 14.303 21.361 28.355. Certificate. Steve Rice, 6850 Deer Ridge Dr., Shawnee, KS 66226. *Look for us on FT8 on 14 or 17 meters*. www.pkarc.org

Sep. 13, 1500Z – 2000Z, K8JWB, Baltimore, MD. SS John W. Brown Radio Club. **SS John W. Brown September 13 Living History Cruise**. 7.210 14.230 21.300 28.320. Certificate. Randall Crenwelge, 2 Laurel Hill Rd., Unit K, Greenbelt, MD 20770. www.ssjohnwbrown.org

Sep. 13, 1600Z – 2300Z, N6IW, San Diego, CA. USS Midway Museum Ship. **Commemorating USS Midway Commissioning in 1945**. 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/n6iw

Sep. 17 – Sep. 24, 0700Z – 0700Z, W3C, Rancho Cucamonga, CA. Jeff Widen. **Constitution Day**. 7.275 14.074 14.250 21.315. QSL. Jeff Widen, 7548 Ramona Ave., Rancho Cucamonga, CA 91730. www.qrz.com/db/w3c or www.qrz.com/db/k6qcb

Sep. 20, 1400Z – 2000Z, W3A, Holtwood, PA. State Line Radio Club. **State Line Radio Club Annual Picnic**. 14.240 21.280. QSL. Edward Reichenbach, 108 Park Cir., Elkton, MD 21921-5444. www.statelineradioclub.com

Sep. 20, 1400Z – 2200Z, W9EFU, Madison, IN. Clifty Amateur Radio Society. **Remembering the Freedom Trail — Underground Railroad through Indiana**. 7.207 14.314 28.328. Certificate. Jerry Barnes, 601 Spring St., Madison, IN 47250. *Unique eCertificate sent to operator's email listed in QRZ*. www.qrz.com/db/w9efu

Sep. 20 – Sep. 21, 1500Z – 2000Z, NØN, Lincoln, NE. Southeast Nebraska Amateur Radio Club. **SENARC 89 Year Anniversary**. 7.180 14.230. Certificate & QSL. Charles Bennett, KDØPTK, P.O. Box 67181, Lincoln, NE 68506. senebrradioclub@gmail.com

Sep. 27, 1230Z – 1930Z, W4G, Villa Rica, GA. West Georgia Amateur Radio Society. **Villa Rica Gold Rush**. 15, 20, 40, and 80 meters; CW, SSB, digital. E-certificate. Available for download at www.wgars.com. *Some members may operate through 0300Z Sep. 28, 2025*. www.wgars.com

Sep. 27, 1400Z – 2200Z, W8PAR, Parkersburg, WV. Parkersburg Amateur Radio Klub. **Volcano Days — Oil and Gas History**. CW: 7.050 14.050; SSB: 7.200 14.250; FT8, 20 and 40 meters. Certificate & QSL. Jerry Wharton, 1722 20th St., Parkersburg, WV 26101-3510. <https://w8par.org>

Sep. 27 – Sep. 28, 1200Z – 2300Z, N4H, Fairview, NC. The Road Show Amateur Radio Club, Inc. **Helene, One Year After**. 14.275. Certificate & QSL. The Road Show Amateur Radio Club, Inc., 57 Echo Lake Dr., Fairview, NC 28730. www.roadshowarc.org

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. *Some clubs may request a nominal fee for QSL cards or certificates. Requests will be made on the air during the event.

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 **December QST** would have to be received by **October 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.

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 June 2025 activity report of the VM Program.

◆ A Technician operator in Texas was issued an advisory concerning 40-meter FT8 operation. Another Technician operator in Texas was issued an advisory concerning 15-meter FT8 operation. On 40 and 15 meters, Technicians have only CW privileges.

◆ Technician operators in Louisiana, Missouri, and New Mexico were issued advisories for operating on 20-meter FT8, a band on which Technicians have no operating privileges.

◆ An operator in Virginia was issued an advisory for deliberate interference to a net on 7.248 MHz. The frequency was not in use when the net control began the roll call. Still, the operator began deliberately interfering because his net was to start sometime later, and

he wanted the frequency clear. The FCC considers this operation to be deliberate interference, in violation of Section 97.101(d) of the Commission's rules. All frequencies in the Amateur Radio Service are shared, and no non-emergency net has greater rights than any other amateur operator.

◆ A commendation was issued to an operator in Texas for courtesy shown to a DX station on April 19, 2025. The operator was managing an AM net on 17 meters but changed frequencies at the request of the DX station.

◆ There was one FCC meeting.

The totals for May 2025 monitoring were 1,452 hours on HF frequencies, and 2,181 hours on VHF frequencies and above, for a total of 3,633 hours.

— *Thanks to Volunteer Monitor Program Administrator Riley Hollingsworth, K4ZDH*

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
TI = Talk-in frequency
Adm = Admission

Alabama (Gadsden) — Sept. 19 – 20 D F H R T V
Fri. 5 PM – 7 PM, Sat. 8 AM – 1 PM. Spr: Gadsden ARC. The Venue at Coosa Landing, 201 George Wallace Dr. TI: 146.67 (100 Hz). Adm: \$10. www.k4jmc.com

Arizona (Heber-Overgaard) — Sept. 13 D R T V
8 AM – 1 PM. Spr: Rim Country ARC. All Seasons Lodge/Ranch, 2365 Bison Ranch Trail. TI: 146.80 (162.2 Hz). Adm: Free. www.w7rim.com

Arizona (Tucson) — Sept. 27 D F H Q R T
7 AM – 11 AM. Spr: Radio Society of Tucson. Calvary Tucson Church, 8711 E. Speedway Blvd. TI: 147.16 (141.3 Hz). Adm: Free. www.k7rst.club

ARRL PACIFIC DIVISION CONVENTION

October 10 – 12, San Ramon, California

D F H Q R S V
8 AM – 9 PM. Spr: Mt. Diablo ARC. San Ramon Marriott Hotel, 2600 Bishop Dr. Adm: \$35 Advance, \$45 door. www.pacificon.org

Colorado (Longmont) — Oct. 5 D F H Q R T
9 AM – 1 PM. Spr: Boulder ARC. Boulder Co. Fairgrounds, 9595 Nelson Rd. TI: 146.70. Adm: \$5. www.barcw0dk.org

ARRL FLORIDA STATE CONVENTION

October 10 – 11, Melbourne, Florida

D F H Q R S T V
Fri. 1 PM – 6 PM, Sat. 9 AM – 3 PM. Spr: Platinum Coast ARS. Melbourne Auditorium, 625 E. Hibiscus Blvd. TI: 146.61. Adm: \$10. www.pcars.org/wp/melbourne-hamfest-2025

Georgia (Ringgold) — Oct. 3 – 4 D F H Q R S T V
Fri. noon – 6 PM, Sat. 8 AM – 3 PM. Spr: Chattanooga ARC. North Georgia GMRS Network. The Colonnade, 264 Catoosa Cir. TI: 145.39 (107.2 Hz). Adm: \$10. Email: gsownsby@w4am.net

Illinois (Belvidere) — Sept. 28 D F H R T V
6 AM – 3 PM. Spr: Chicago FM Club. Boone Co. Fairgrounds, 8791 IL-76. TI: 146.76 (107.2 Hz). Adm: \$8 Advance, \$10 door. www.chicagofmclub.org

ARRL CENTRAL DIVISION CONVENTION

September 20 – 21, Chillicothe, Illinois

D F H Q R S V
Sat. 7 AM – 7 PM, Sun. 7 AM – 1 PM. Spr: Peoria-Area ARC. Three Sisters Park, 17189 IL-29. TI: 145.075 (156.7 Hz). Adm: \$8 Advance, \$10 door. www.w9uvi.com/midwest-superfest

Indiana (Edinburgh) — Sept. 13 F H T
9 AM – noon. Spr: Mid-State ARC. Atterbury State FWA Headquarters parking lot, 7970 S. Rowe St. TI: 146.52. Adm: Free. www.midstatehams.org

Indiana (Shelbyville) — Oct. 4 F H R T
8 AM – noon. Spr: Blue River Valley ARS. Shelby Co. Fairgrounds, 500 Frank St. TI: 145.48 (88.5 Hz). Adm: Free. www.brvars.com

Iowa (Columbus Junction) — Oct. 5 D F H R S T V

7 AM – 2 PM. Spr: Muscatine ARC. Louisa Co. Fairgrounds, 101 Fairground Rd. TI: 146.985 (192.8 Hz). Adm: \$10. www.muscatinearc.org

Iowa (Indianola) — Sept. 20 D F H R S T V

8 AM – noon. Spr: Warren ARS. St. Thomas Aquinas Catholic Church, 210 S. Wesley St. TI: 147.194 (114.8 Hz). Adm: \$10. www.warrenradiosociety.org

Iowa (Sioux City) — Sept. 20 F H R S V

8:45 AM – 1 PM. Spr: Sooland ARA. Morningside Lutheran Church (lower gym), 700 S. Martha St. TI: 146.97 (110.9 Hz). Adm: \$5. www.facebook.com/groups/591123127614974

Kansas (Wichita) — Sept. 27 D F H R S V

8 AM – 1 PM. Spr: Valley Center ARC. RiverWalk Church of Christ, 225 N. Waco Ave. TI: 146.940 (103.5 Hz). Adm: \$5. Email: wichitahamfest2025@gmail.com

Kentucky (Paintsville) — Sept. 27 F H R T V

9 AM – 1 PM. Spr: Amateur Radio Community Services. Paintsville Recreation Center, 232 Preston St. TI: 147.225 (127.3 Hz). Adm: \$5. www.ky4arc.com

Kentucky (Richmond) — Sept. 13 D F H R T V

8 AM – 12:30 PM. Spr: Central Kentucky ARS. Madison Co. Fairgrounds, 3237 Old Kentucky Hwy. 52. TI: 145.37 (192.8 Hz) or 146.715 (100 Hz). Adm: \$5. www.ckars.org

ARRL LOUISIANA STATE CONVENTION

September 12 – 13, Slidell, Louisiana

D F H R S V
Fri. 2 PM – 5 PM, Sat. 8 AM – 3 PM. Spr: Ozone ARC. Slidell City Auditorium, 2056 2nd St. TI: 147.27 (114.8 Hz). Adm: \$5. www.w5sla.net

Maine (Alexander) — Sept. 20 D F H R T V

8 AM – noon. Spr: St. Croix Valley ARC. Alexander Elementary School, 1430 Airline Rd. TI: 147.33 (118.8 Hz). Adm: \$5. www.stcroixvalleyamateurradioclub.com

Maryland (West Friendship) — Oct. 5 D F Q H R T V

6 AM – 3 PM. Spr: Columbia ARA. Howard Co. Fairgrounds, 2210 Fairgrounds Rd. TI: 147.39 (156.7 Hz). Adm: \$10. www.carafest.org

Michigan (Adrian) — Sept. 14 D F H R T V

8 AM. Spr: Adrian ARC. Lenawee Co. Airport, 2651 W. Cadmus Rd. TI: 145.37. Adm: \$6. www.w8tqe.com

Michigan (Baraga) — Oct. 4 F R T V

9 AM – 1 PM. Spr: KCRA, CCRAA, BCRA. KBIC Senior Center, 208 Main St. TI: 146.52. Adm: \$5. www.kcra-mi.net

Michigan (Gaylord) — Sept. 20 D H R T V

9 AM – 1 PM. Spr: Top of Michigan, Thunder Bay ARCs. Gaylord Knights of Columbus Hall, 2573 Wilkinson Rd. TI: 146.82 (118.8 Hz). Adm: \$5. www.nm8rc.org

Michigan (Kalamazoo) — Oct. 4 D H R S V

9 AM – 3 PM. Spr: Kalamazoo ARC. Southwest Michigan Amateur Radio Team. Kalamazoo Co. Expo Center, 2900 Lake St. TI: 147.04 (94.8 Hz). Adm: \$8. www.kalamazooamfest.org

Michigan (Shelby Township) — Sept. 13 D F T

8 AM – noon. Spr: General Motors ARC. Packard Proving Grounds, 49965 Van Dyke Ave. TI: 443.075 (123 Hz). Adm: \$5 per car. <http://gmarc.org>

Michigan (West Branch) — Sept. 13 FHR

8 AM – 1 PM. *Spr:* Ogemaw Arenac ARS. Ogemaw Nature Park, 5626 W. Rose City Rd. *Tl:* 146.94 (103.5 Hz). *Adm:* \$5. www.k8oar.club

Minnesota (Brewster) — Sept. 13 FHRV

9 AM – 1 PM. *Spr:* Northern Plains Regional Radio Council. American Legion Post #464, 825 3rd Ave. *Tl:* 146.67 (141.3 Hz). *Adm:* \$5. www.facebook.com/groups/NPRRC

ARRL DAKOTA DIVISION CONVENTION

September 27, Moorhead, Minnesota

FHQRSV

9 AM – 2 PM. *Spr:* Red River Radio Amateurs. Minnesota National Guard Armory, 1002 15th Ave. N. *Tl:* 145.35 (123 Hz). *Adm:* \$10. www.rrra.org

ARRL MIDWEST DIVISION CONVENTION

October 10 – 11, Sedalia, Missouri

FHQRSV

Fri. noon – 5 PM, Sat. 8 AM – 5 PM. *Spr:* Sedalia-Pettis Amateur Radio Klub. Missouri State Fairgrounds, 2503 W. 16th St. *Tl:* 147.03 (179.9 Hz). *Adm:* TBD. Email: w0vk@arri.net

Nevada (Reno) — Sept. 13 DFT

7 AM – noon. *Spr:* Sierra Nevada ARS. Cabela's Reno, 8650 Boomtown Garson Rd. *Tl:* 147.210 (100.0 Hz). *Adm:* Free. www.renohamswap.com

New Jersey (Tinton Falls) — Sept. 27 DFQRV

8 AM – 1 PM. *Spr:* Garden State ARA. MOESC, 100 Tornillo Way. *Tl:* 147.045 (67 Hz). *Adm:* \$5. www.gsara.club

New Jersey (Wayne) — Sept. 13 FHRV

8 AM – 1 PM. *Spr:* Wayne Radio Amateur Emergency Team. Wayne United Methodist Church, 99 Parish Dr. *Tl:* 145.21 (79.7 Hz). *Adm:* \$5. <https://wraet.com>

ARRL NEW MEXICO STATE CONVENTION

September 19 – 21, Albuquerque, New Mexico

DFHQIRSTV

8 AM – 5 PM. *Spr:* New Mexico Hamvention, Inc. Embassy Suites, 1000 Woodward Pl. NE. *Tl:* 145.33 (100 Hz), 440.00 (100 Hz). *Adm:* \$20 Advance, \$25 door. www.dukecityhamfest.org

New York (Henrietta) — Oct. 7 – 11 DFHIRST

9 AM – 5 PM. *Spr:* Antique Wireless Association. RIT Inn and Conference Center, 5257 W. Henrietta Rd. *Adm:* \$70 Advance (conference), \$75 door (conference); flea market, free. www.antiquewireless.org/homepage/annual-conference

New York (Hopewell Junction) — Sept. 14 FHRVT

8 AM – 2 PM. *Spr:* Mount Beacon ARC. Knights of Columbus (Fishkill), 339 NY-82. *Tl:* 146.97 (100 Hz). *Adm:* \$5. www.wr2abb.org

New York (Horseheads) — Sept. 27 FHRVT

6 AM – 2 PM. *Spr:* ARA of the Southern Tier. Chemung Co. Fairgrounds, 170 Fairview Rd. *Tl:* 147.36 (123.0 Hz), 145.22. *Adm:* \$6 Advance, \$8 door. www.arasth3.org/arast_website/public/hamfest.php

North Carolina (Lexington) — Sept. 27 DFRTV

8 AM – 2 PM. *Spr:* Healing Springs Mountain VHF Society. Lexington Farmers Market Flea Market, 366 Livestock Market Rd. *Tl:* 146.91 (107.2 Hz). *Adm:* \$5. www.w4par.org

Ohio (Berea) — Sept. 28 DFHQIRSTV

8 AM – noon. *Spr:* Hamfest Association of Cleveland. Cuyahoga Co. Fairgrounds, 164 Eastland Rd. *Tl:* 145.41 (110.9 Hz), 442.225 (131.8 Hz). *Adm:* \$10. www.hac.org

Ohio (Lima) — Oct. 4 FHRVT

8 AM – noon. *Spr:* Northwest Ohio ARC. New Hope Christian Center, 2240 Baty Rd. *Tl:* 146.67 (118.8 Hz). *Adm:* Free; donations accepted. www.nwoarc.com

Ohio (Toledo) — Sept. 13 DFH

10:30 AM – 2:30 PM. *Spr:* Lucas Co. ARES. Merchants Landing (Bingo Hall), 6182 N. Summit St. *Tl:* 444.925 (103.5 Hz). *Adm:* \$2. www.lucasares.org

Oklahoma (Enid) — Sept. 20 DFHIRSTV

8 AM – 3 PM. *Spr:* Enid ARC. Chisholm Trail Expo Center, 111 W. Purdue Ave. *Tl:* 444.825 (141.3 Hz). *Adm:* \$8 Advance, \$10 door. www.enidarc.org

Pennsylvania (Clearfield) — Sept. 14 DFHIRSTV

7 AM – 1 PM. *Spr:* Clearfield Co. ARC. Clearfield Co. Fairgrounds, Agriculture Building and surrounding grounds, 5615 Park St. *Tl:* 147.255 (173.8 Hz). *Adm:* \$5. www.clearfieldcountyarcc.net

Pennsylvania (East Stroudsburg) — Sept. 14 DFHQRTV

8 AM – 2 PM. *Spr:* Eastern Pennsylvania ARA. Moose Lodge 1336, 705 Stokes Mill Rd. *Tl:* 147.045 (131.8 Hz). *Adm:* \$7. www.qsl.net/n3is

Pennsylvania (New Holland) — Oct. 4 DHRSTV

8 AM. *Spr:* Red Rose Repeater Association. Garden Spot Fire & Rescue, 339 E. Main St. *Tl:* 147.015 (118.8 Hz). *Adm:* \$5. www.w3rrr.org

ARRL SOUTH CAROLINA SECTION CONVENTION

October 4, Rock Hill, South Carolina

DFHRTV

8 AM – 2 PM. *Spr:* York Co. ARS. Covenant Presbyterian Church, 1830 Celanese Rd. *Tl:* 147.03. *Adm:* \$5. www.ycars.org

Texas (Belton) — Oct. 4 DFHRTV

7 AM – 1 PM. *Spr:* Temple ARC. Cadence Bank Center, 301 W. Loop 121. *Tl:* 146.82 (123.0 Hz). *Adm:* \$10. www.tarc.org

Virginia (Elkton) — Sept. 6 HQR T

7 AM – 1 PM. *Spr:* Page Valley ARC. Jr. OUAM park, 900 Shenandoah Ave. *Tl:* 146.625 (131.8 Hz). *Adm:* \$5. Email: seifemi@verizon.net

ZERO RETRIES DIGITAL CONFERENCE

September 13, Everett, Washington

S

8 AM – 5 PM. *Spr:* Zero Retries Newsletter. Edward D. Hansen Conference Center, 2000 Hewitt Ave. *Tl:* TBD. *Adm:* See website. www.zeroretires.org/p/conference

Wisconsin (Bloomer) — Sept. 20 DFHTV

8 AM – 1 PM. *Spr:* Chippewa Valley ARC. Bloomer Fairgrounds, 1609 9th Ave. *Tl:* 147.975 (110.9 Hz). *Adm:* \$10. www.w9cva.org/hamfest

Wisconsin (Colby) — Oct. 4 DHR

8 AM – noon. *Spr:* Black River ARA. Colby Lions Pavilion, 103 W. Adams St. *Tl:* 147.15 (114.8 Hz). *Adm:* \$5. Email: hommelsd@tds.net

Wisconsin (Milwaukee) — Sept. 19 – 20 HQRSTV

Fri. noon – 5 PM, Sat. 9 AM – 3 PM. *Spr:* Ham Radio Outlet. Ham Radio Outlet Milwaukee, 5710 Good Hope Rd. *Tl:* 145.13 (127.3 Hz). *Adm:* Free. Email: w9tjp@hamradio.com

At the Foundation

ARRL Foundation Presents the 2025 Scholarship Recipients

The ARRL Foundation is pleased to present the students selected to receive scholarship awards for 2025. Scholarships are made possible through the generosity of individuals and clubs. This year, 170 scholarships totaling more than \$800,000 were awarded. The ARRL Foundation Board of Directors offers these amateur radio operators best wishes for continued success as they pursue their college degrees. The 2026 application period is expected to open in October 2025. For more information, please visit www.arrl.org/scholarship-program.



**Jesse Adler,
N6JCA**
Dayton Amateur
Radio Association
Scholarship



**Jack Allen,
KI5QMN**
Fred R. McDaniel
Memorial
Scholarship



**Nicole
Avshalumova,
KE2CNA**
East Coast
Amateur Radio
Service (ECARS)
Scholarship



**McKayla Beldyk,
KO4NXG**
YASME
Foundation
Scholarship



**Ariel Berger,
K2NYS**
Henry Broughton,
K2AE, Memorial
Scholarship



**Rachel Berger,
K4VIP**
Richard G.
Kirkpatrick,
K8WU, Memorial
Scholarship



**Benjamin Bianco,
KO4SXZ**
IRARC Memorial,
Joseph P. Rubino,
WA4MMD,
Scholarship



**Ian Bigler,
KC3DTE**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship, and
Steel City ARC
Scholarship



**Aaron Bilow,
W3WAM**
Michael R. Ware,
NN3I, Scholarship



**Ely Bowles,
WO0EE**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship



**Benjamin
Braddock,
KO4MAO**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Christopher
Brault, KK8C**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship



**John Brown,
KK7JJT**
Michael Holt,
K8MJH, and Mary
Holt, KC8OIP,
Scholarship



**Colby Chandler,
KI5TCO**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Lexi Chase,
KJ5HTA**
Helen Laughlin
AM Mode
Memorial
Scholarship



**Fedor Chayka,
KJ7OTY**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Maxwell Cohen,
KC1QGN**
Dayton Amateur
Radio Association
Scholarship



**Dominic
Cronauer,
KC3NNW**
James Cothran,
KD3NI,
Scholarship



**Briana Curley,
KK7RXN**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship, and
Charles N.
Fisher Memorial
Scholarship



**Parth Darade,
VU3ZNE**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Nathan Day,
KJ5DVN**
Walter
Gallinghouse,
K5DSL,
Scholarship, and
Louisiana
Memorial
Scholarship



**Marcello Dean,
K6MLD**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Corey Dennen,
NW1BB**
New England
Amateur Radio
Festival (NEAR-
Fest) Memorial
Scholarship



**McKenzie
Denton, KO4GLN**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Krish Desai,
KD9RGN**
New England
FEMARA
Scholarship



**Trey Drenon,
KO6CIZ**
Martin J. Green Jr.,
K2PLF, Memorial
Scholarship



**Ian Duncan,
KC9THI**
William C.
Winscott, N6CHA,
Memorial
Scholarship



**Frank D'Urso,
K1MKY**
The 10-10
International Net
Scholarship



**Ethan Edwards,
AE4CE**
Free Family
Scholarship,
[N3TG (SK),
K3MAF, KC3YO,
K4FRE, KB4HGU
(SK)], and Vienna
Wireless Society
Scholarship



**Isabelle Ellard,
KQ4JRR**
Alan G. Thorpe,
K1TMW, Memorial
Scholarship



**James Ervin,
K1SUXW**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Benjamin
Faershtein,
KO6CNT**
Harry J. Dannals,
W2HD, Memorial
Scholarship



**Joseph Farkas,
KX4YS**
Gwinnett Amateur
Radio Society
Scholarship



**Dylan Fielding,
KJ7MFU**
Hy and Mimi
Ginsberg
Memorial
Scholarship



**Katherine Forson,
KT5KMF**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Landon Gale,
A17HE**
Central Arizona
DX Association
Scholarship



**Samuel Garlough,
KO6GMZ**
ARRL Foundation
General Fund
Scholarship



**Christopher
Geiser, KC3IVM**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Andrew Gentry,
K4UPX**
Jake McClain
Driver, KC5WXA,
Scholarship



**Natalie Gilbert,
N1PNK**
New England
FEMARA
Scholarship



**Michael Gilbert-
Cabaceira,
K15TXS**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship,
and Robert
A. Rodriguez,
K5AUW,
Scholarship (San
Antonio Radio
Club, Inc.)



**Nicholas
Glennon, KQ4LII**
Charles Clarke
Cordle Memorial
Scholarship



**William Gonzalez,
KD9YWL**
Ozaukee Radio
Club, W9CQO,
Scholarship,
and Edmond
A. Metzger
Scholarship



**Matthew Guercio,
KD2TFA**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Markus Hansen,
W7MTH**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Brynn Hebert,
KG5KRV**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Logan Hebert,
KG5LLM**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Leon Hellmich,
DL3ON**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Maxwell
Hochschild,
AC1MX**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**John Horan,
AE0ZY**
The 10-10
International Net
Scholarship



**William Houser,
KN4EZW**
Ernest L.
Baulch, W2TX,
and Marcia E.
Baulch, WA2AKJ,
Scholarship



**Der-Han Huang,
KO6ECC**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship



**Julian Hughes,
KC1KDY**
Byron Blanchard,
N1EKV, Memorial
Scholarship



**Mikayla Hunt,
KK7HSE**
William Bennett,
W7PHO, Memorial
Scholarship



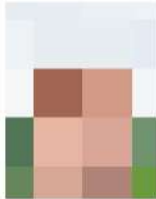
**Andrew Johnson,
N4HFR**
Richard W.
Bendicksen,
N7ZL, Memorial
Scholarship



**Chandler
Johnson,
KK7WRR**
Joel R. Miller,
W7PDX, and
Martha C.
Miller STEM
Scholarship



**Rachel Jones,
K04HLC**
Ronald
Hesselbrock,
WA8LOW,
Memorial
Scholarship



**Akshay Kapur,
K5AKX**
Dayton Amateur
Radio Association
Scholarship



**Simon Kauffman,
KS4SK**
Carole J. Streeter,
KB9JBR,
Scholarship



**Aidan Kern,
N3AMK**
You've Got
a Friend in
Pennsylvania
Scholarship



**Cyrus Khabbaz,
KQ4EYI**
East Coast
Amateur Radio
Service (ECARS)
Scholarship



**Alex Kinch,
K8CD**
Don Riebhoff
Memorial
Scholarship



**William Klipfel,
KF0JQD**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship



**Robert
Koberstein,
KN6ZNG**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Caroline Kuebert,
KM4VCO**
Potomac
Valley Radio
Club (PVRC)
Scholarship



Grace Lea, KE3G
Homer V.
Thompson,
W4CWV, and
Annette P.
Thompson,
W4LKM, Memorial
Scholarship



Hope Lea, ND2L
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Zechariah Lea,
WX4TVJ**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Darwin Lee,
KE0WSS**
Ray, N0RP, &
Katie, W0KTE,
Pautz Scholarship



**Joshua Lee,
KN6GFZ**
ARRL Scholarship
to Honor Barry
Goldwater



**Nicholas
Lenfestey,
KQ4VAE**
Gary Wagner,
K3OMI,
Scholarship



**Lily Leslie,
AD2FJ**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Gordon
Lichtstein,
KY4BA**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Alisha Lin,
K6AML**
William Gordon
Buckner, W0VZK,
Memorial
Scholarship



**Ashley Lin,
K6BOO**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship,
and Carole J.
Streeter, KB9JBR,
Scholarship



**Scott Little,
K15WLJ**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Brennan Long,
K6BFL**
CWops
Scholarship



**Jake Long,
K04JUJ**
Maryland
Military Auxiliary
Radio Service,
Inc. (MMARSI)
Scholarship



**Webster Lowe,
KC3OOM**
K3IVO Freestate
Amateur Radio
Club Scholarship



**Matthew Lyon,
KN4MXH**
Fritz Nitsch,
W4NTQ, Memorial
Scholarship



**Luke Magruder,
KD9ZLO**
Steve Marks,
W5CIA, Legacy
Scholarship



**William Maher,
K04WRM**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship



**Joshua Martinez,
K17NOX**
Mary Lou Brown
Scholarship



**Konstantin
Maslov, KE2CMS**
Frankford Radio
Club Scholarship



**Anna Matson,
KN4IVD**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Alistair
McConaughy,
KQ4YDE**
Ted, W4VHF, and
Itice, K4LVV,
Goldthorpe
Scholarship



**Dominic
McDevitt, N5ALT**
Bill, W2ONV, and
Ann Salerno
Memorial
Scholarship



**Audrey McElroy,
KM4BUN**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship



**James McNiff,
K04EEX**
Scholarship of the
Morris Radio Club
of New Jersey



**Sabrina Mol,
WS8EMT**
Dayton Amateur
Radio Association
Scholarship



**Luke Moore,
AA5L**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Kelsi Mulley,
KE9LSI**
Six Meter Club
of Chicago
Scholarship



**Lincoln Nichols,
KC1PHK**
New England
FEMARA
Scholarship



**Fisher
Novencido,
KF0OVS**
Paul and Helen
L. Grauer
Scholarship



**Howard Olson,
K0ITE**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Shiphi Panicker,
AA1SP**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Grace Papay,
K8LG**
ARRL Foundation
General Fund
Scholarship



**Violet Park,
KD9YCU**
Dayton Amateur
Radio Association
Scholarship



**Preston Parsons,
W1PGP**
Bill, W2ONV, and
Ann Salerno
Memorial
Scholarship



**Jonathan Patton,
KC3PQC**
Potomac
Valley Radio
Club (PVRC)
Scholarship



**Hope Percy,
KD9KUR**
Rev. Paul E.
Bittner, W0AIH,
Memorial
Scholarship



**Omar Perez,
KK7NHU**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship



**Taylor Peterson,
AE0OZ**
L. B., W4RNL,
and Jean R.
Cebik, N4TZP,
Scholarship



**Anna Poeth,
KD2YYA**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship, and
Henry Broughton,
K2AE, Memorial
Scholarship



**Alexandra Potter,
KK7TGI**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Nathan Prince,
KD9RCA**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Cody Quarles,
K0DIE**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship



**Campbell Reed,
KD9GEK**
ARRL Foundation
General Fund
Scholarship,
and Clive
Frazier, K9FWF,
Scholarship



**Ellie Reeves,
KE8ZUO**
Warren Brown,
MD, KD4GUA,
Memorial
Scholarship



**Maria Reichard,
KE8SPB**
ARRL Foundation
General Fund
Scholarship



**Elijah Resano,
KF0RNM**
Irving W. Cook,
WA0CGS,
Scholarship



**Augustine
Rickert, KE0MDV**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship



**Luke Rickert,
KE0MDW**
L. B., W4RNL,
and Jean R.
Cebik, N4TZP,
Scholarship



**Evelyn Robbins,
KL5PB**
Lois Manley,
K7LMZ, and
Randall Pitchford,
WW7ZZ,
Scholarship



**Jack Roberts,
W9RFT**
Indianapolis
Amateur Radio
Association
Scholarship



**Joseph Robles Jr,
K15TLZ**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship



**Sepehr Sahraian,
N6IRN**
Dayton Amateur
Radio Association
Scholarship



**Jose Sandoval,
KC1TWM**
The Quarter
Century Wireless
Association,
Inc. (QCWA)
Scholarship,
and L. Phil and
Alice J. Wicker
Scholarship



**Emma Schaefer,
KC9YGJ**
Amateur
Radio Digital
Communications
(ARDC)
Scholarship,
and David
Knaus Memorial
Scholarship



**Isaac Schofer,
AC3CJ**
CARA Merit
Scholarship



Mark Seltzer, KC1MNF
Anthony J. (Tony) Medeiros, Jr., W1PM, Scholarship



Maximilian Shabatayev, KE2CNK
The Quarter Century Wireless Association, Inc. (QCWA) Scholarship



Dhrumi Shah, KI5CRN
ARRL Foundation General Fund Scholarship, and Robert A. Rodriguez, K5AUW, Scholarship (San Antonio Radio Club, Inc.)



Ritwik Sharma, KO6EUF
RFinder LLC – Arthur L. Greenberg, W2LH, and Madeleine Greenberg, W2EEO, Memorial Scholarship



Mallory Sheehan, KN6PHG
Amateur Radio Digital Communications (ARDC) Scholarship



Matthew Shook, KQ4JQU
Gulf Coast Amateur Radio Club Scholarship



Benjamin Silver, KJ7UQV
Martin J. Green, Sr., K2TEO, Memorial Scholarship



Kira Smith, KO4SBI
Amateur Radio Digital Communications (ARDC) Scholarship



Alexia Snethen, KM6LGG
William R. Goldfarb Memorial Scholarship



Remington Snoke, KF0IWI
PHD Amateur Radio Association Scholarship



Dalton Southerland, W1DGS
Amateur Radio Digital Communications (ARDC) Scholarship



Declan Steele, KC1NPL
Dr. James L. Lawson Memorial Scholarship



Lydia Stenberg, KF0BGX
Medical Amateur Radio Council (MARCO) Scholarship



Kate Stingle, KJ7UXS
The Michael Tortorella, W2IY, Scholarship Fund



Gavin Sutton, KI5FBP
Amateur Radio Digital Communications (ARDC) Scholarship



Grant Trier, K7GTT
Mary Lou Brown Scholarship



Ellie Urbancic, K7ELZ
The Quarter Century Wireless Association, Inc. (QCWA) Scholarship



Nickie Valerio, KK7MNN
Amateur Radio Digital Communications (ARDC) Scholarship



Kees Van Oosbree, W0AAE
Amateur Radio Digital Communications (ARDC) Scholarship



Bernadette Wagner, KE8LWO
The Quarter Century Wireless Association, Inc. (QCWA) Scholarship



Mikayla Wagner, N1BKR
CTRI/Chris Seeber, KA1GEU, Memorial Scholarship



Kaleb Watts, KK7STE
Amateur Radio Digital Communications (ARDC) Scholarship



Joshua Wells, AF5ID
Allen and Bertha Watson Memorial Scholarship



Ruth Willet, KM4LAO
Amateur Radio Digital Communications (ARDC) Scholarship, and Clive Frazier, K9FWF, Scholarship



Dylan Williams, KJ5AGZ
Mississippi Scholarship, and Magnolia DX Association Scholarship



Maiyun Zhang, AK6DS
Alfred E. Friend, Jr., W4CF, Memorial Scholarship, Palomar Amateur Radio Club Scholarship, and K6GO Gayle Olson and NA6MB Mike Binder Scholarship



Benjamin Zielinski, W9ZVE
Amateur Radio Digital Communications (ARDC) Scholarship

Photos were unavailable for the following scholarship recipients:

Paul Dugdell, KO4PZA
Challenge Met Scholarship

Julie Knappik, KB1YTT
New England FEMARA Scholarship

Gabriela Gomez, KK7TXX
The Quarter Century Wireless Association, Inc. (QCWA) Scholarship

Morgan Lyons, KI5SXY
Michael Holt, K8MJH, and Mary Holt, KC8OIP, Scholarship

Austin Hadley, KE8YGW
Maryland Military Auxiliary Radio Service, Inc. (MMARS) Scholarship

Elizabeth Todd, KQ4ZAL
The 10-10 International Net Scholarship



Certificate of Code Proficiency Recipients



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.

January 2025

Ronald M. Bell, KG5CWH	10
Luke A. Sandell, KN4FVR	10
Freddie O. Cruz, AA2QL	15
Forrest Phillips, AE0QH	15
Ron Kinney, KC0ZPS	30

February 2025

Michael R. Meadows, KE0FFT	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
Simpson A. Huston, N8UZF	10
Steven M. Johnson, WB4WBO	10
Clifford R. Cantrell, N5GWU	15
Steven M. Johnson, WB4WBO	15
Joseph L. Kelly, N9SV	15
Michael A. Kramer, N5XTH	30
Michael A. Kramer, N5XTH	35

May 2025

Bruce A. Smith, W4DPI	10
Jeremy L. Wallace, NR9I	10
Vincent L. DeCaprio, KD2VLQ	15
Kenneth F. Robinson, K8SCA	15
Thomas P. Stelmach, N0QBX	15
Barry G. Fluxe, W4LSV	25

June 2025

Glenn M. Davies, KO4NTA	10
Michael A. Krahenbuhl, K0ARA	25
Gary C. Tartanian, K3WK	25

Congratulations to all of the recipients.

September 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.

September 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, September 17, at 9 PM PDT (0400 UTC on September 18) 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 – September 2025

(All times are in Eastern Daylight Time.)

Monday	Tuesday	Wednesday	Thursday	Friday
Labor Day	9/2 7 PM – 2300Z 35 – 10 WPM	9/3 9 AM – 1300Z 10 – 35 WPM	9/4 10 PM – 0200Z (9/5 – UTC) 10 – 40 WPM	
9/8 7 PM – 2300Z 10 – 40 WPM	9/9 10 PM – 0200Z (9/10 – UTC) 10 – 35 WPM	9/10 9 AM – 1300Z 35 – 10 WPM		
9/22 7 PM – 2300Z 10 – 40 WPM		9/24 10 PM – 0200Z (9/25 – UTC) 35 – 10 WPM	9/25 9 AM – 1300Z 10 – 35 WPM	
	9/30 4 PM – 2000Z 35 – 10 WPM			

Contest Corral

September 2025

Check for updates and a downloadable PDF version online at www.arri.org/contest-calendar.

Refer to the contest websites for full rules, scoring information, operating periods or time limits, and log submission information.

Start - Finish		Date-Time		Bands	Contest Name	Mode	Exchange	Sponsor's Website
Date	Time	Date	Time					
1	1900	1	2030	3.5	RSGB 80m Autumn Series, SSB	Ph	RS, serial	www.rsgbcc.org
1	2300	2	0300	1.8-28,50	MI QRP Labor Day CW Sprint	CW	RST, SPC, mbr or pwr	www.miqr.net/contest
3	2000	3	2100	3.5	UKEICC 80m Contest	Ph	6-char grid square	www.ukelcc.com
4	0000	5	0300	7	Walk for the Bacon QRP Contest	CW	RST, SPC, name, mbr or pwr; 13 WPM max	qrptest.com/pigwalk40
4	1800	4	2200	28	NRAU 10m Activity Contest	CW Ph Dig	RS(T), 6-char grid square	nrau.net
6	0000	7	2359	1.8-28	All Asian DX Contest, Phone	Ph	RS, 2-digit age	www.jarl.org
6	0800	7	1000	50,144,432	SARL VHF/UHF FM Contest	Ph	RS(T), 6-char grid square	www.sarl.org.za
6	0800	7	1000	1.8-28	SARL Field Day Contest	CW Ph Dig	RS(T), # of rigs, category, province or "DX"	mysarl.org.za
6	1200	7	1159	3.5-28	Russian RTTY WW Contest	Dig	RST, 2-letter oblast or serial	www.contest.ru
6	1300	7	1259	1.8-28	IARU Region 1 Field Day, SSB	Ph	RST, serial	www.darc.de
6	1300	7	1300	3.5-28	RSGB SSB Field Day	Ph	RS, serial	www.rsgbcc.org
6	1300	6	1600	7	AGCW Straight Key Party	CW	RST, serial, class, name, age	www.agcw.de
6	1400	6	2200	3.5-28	Ohio State Parks on the Air	Ph	OH park abbreviation or SPC	ospota.org
6	1400	7	1400	145	IARU Region 1 145 MHz Contest	CW Ph Dig	RS(T), serial, 6-char grid square	www.iaru-r1.org
6	2000	7	2000	3.5	PODXS 070 Club Jay Hudak Memorial 80m Sprint	Dig	RST, SPC	www.podxs070.com
7	1000	7	1400	144	WAB 144 MHz Phone	Ph	RS, serial, WAB square or country	wab.intermip.net
7	1700	8	0300	All, no WARC	Tennessee QSO Party	CW Ph Dig	RS(T), TN county or SPC	tnqp.org
9	1800	9	1859	3.5	DARC CW-Training Contest	CW	RST, mbr/"NM" or serial	www.darc.de
10	1900	10	2030	3.5	RSGB 80m Autumn Series, CW	CW	RST, serial	www.rsgbcc.org
13	0000	14	2359	2.3 GHz and up	ARRL EME Contest	CW Ph Dig	4-char grid square	www.arri.org/eme-contest
13	0000	14	2359	3.5-28	WAE DX Contest, SSB	Ph	RS, serial	www.darc.de
13	1500	13	1800	3.5-14	Africa FT4 DX Contest	Dig	Signal report, 4-char grid square	www.sarl.org.za
13	1800	15	0300	50 and up	ARRL September VHF Contest	CW Ph Dig	4-char grid square	www.arri.org/september-vhf
14	0000	14	0400	3.5-14	North American Sprint, CW	CW	Other's call, your call, serial, name, SPC	ncjweb.com/Sprint-Rules.pdf
14	1300	14	1330	432	IRTS 70cm Counties Contest	Ph	RS(T), serial, county (if E/GI)	www.irts.ie
14	1330	14	1500	144	IRTS 2m Counties Contest	Ph	RS(T), serial, county (if E/GI)	www.irts.ie
15	0000	15	0200	1.8-28	4 States QRP Group Second Sunday Sprint	CW Ph	RS(T), SPC, mbr or pwr	www.4sqrp.com
15	1900	15	2100	3.5-28	RSGB FT4 Contest	Dig	Signal report	www.rsgbcc.org
18	0000	19	0300	14	Walk for the Bacon QRP Contest	CW	RST, SPC, name, mbr or pwr; 13 WPM max	qrptest.com/pigwalk20
18	1800	18	1959	3.5	BCC QSO Party	CW Ph Dig	RS(T), T-shirt size	www.bavarian-contest-club.de
18	1900	18	2000	3.5-14	NTC QSO Party	CW	Max 25 WPM; RST, mbr or "NM"	pi4ntc.nl/ntcqp
19	1600	19	1700	3.5	AGB NEMIGA Contest	CW Ph Dig	RST, serial, mbr (if any)	ev5agb.com
20	0900	22	0759	10 GHz to light	ARRL 10 GHz and Up Contest	CW Ph Dig	6-char grid square	www.arri.org/10-ghz-up
20	1200	21	1200	3.5-28	Scandinavian Activity Contest, CW	CW	RST, serial	www.sactest.net
20	1400	21	0159	3.5-28	New Jersey QSO Party	CW Ph Dig	RS(T), NJ county or SPC	www.k2td-bccr.org
20	1400	21	2000	All, no WARC	Texas QSO Party	CW Ph Dig	RS(T), TX county or SPC	www.txqp.net
20	1400	21	0200	All, no WARC	Iowa QSO Party	CW Ph Dig	RS(T), IA county or SPC	www.w0yl.com
20	1500	20	2100	1.8-28	QRP Afield	CW Ph Dig	RS(T), SPC, mbr or pwr	www.newenglandqrp.org
20	1600	21	2200	3.5-28	New Hampshire QSO Party	CW Ph Dig	RS(T), NH county or SPC	www.w1wqm.org
20	1600	21	2359	1.8-28,50	Washington State Salmon Run	CW Ph	RS(T), WA county or SPC	salmonrun.wdxc.org
20	1600	20	2300	All, no WARC	Wisconsin Parks on the Air	CW Ph Dig	WI park number or SPC	wipota.com
21	0000	21	0400	3.5-14	North American Sprint, RTTY	Dig	Other's call, your call, serial, name, SPC	ncjweb.com/Sprint-Rules.pdf
21	1700	21	2059	3.5-28	BARTG Sprint PSK63 Contest	Dig	Serial	bartg.org.uk
21	2300	22	0100	1.8-28	Run for the Bacon QRP Contest	CW	RST, SPC, mbr or pwr	qrptest.com/pigrun
22	2300	23	0600	144	144 MHz Fall Sprint	CW Ph Dig	4-char grid square	packratvhf.com
24	2000	24	2100	3.5	UKEICC 80m Contest	CW	6-char grid square	www.ukelcc.com
25	1900	25	2030	3.5	RSGB 80m Autumn Series, Data	Dig	RST, serial	www.rsgbcc.org
27	0000	28	2359	3.5-28	CQ Worldwide DX Contest, RTTY	Dig	RST, CQ zone, US/VE state/prov	www.cqwwrtty.com
27	1200	28	1159	3.5-28	YU DX Contest	CW Ph	RS(T), YU/YT county or serial	www.yudx.yu1srs.org.rs
27	1200	28	1200	1.8-28	Maine QSO Party	CW Ph	RS(T), ME county or SPC	www.ws1sm.com
27	1400	27	1800	144,432	AGCW VHF/UHF Contest	CW	RST, serial, pwr, 6-char grid square	www.agcw.de
27	1400	27	2200	3.5-28	Masonic Lodges on the Air	Ph	Lodge name, lodge no., jurisdiction or SPC	cqmorelight.com
27	2000	28	2359	1.8-14,28	AWA Amplitude Modulation QSO Party	Ph	Name, SPC	antiquewireless.org
28	0700	28	1000	50	UBA ON Contest, 6m	CW Ph	RS(T), serial, ON (for ON)	www.uba.be
30	2300	1	0600	222	222 MHz Fall Sprint	CW Ph Dig	4-char grid square	packratvhf.com

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.

ARRL VEC Volunteer Examiner Honor Roll

The ARRL VEC Honor Roll recognizes the top 10 Volunteer Examiners in each ARRL Division according to the total number of ARRL exam sessions in which they have participated since their accreditations. Considering each session requires an average time commitment of 2 to 4 hours or more, the thousands of hours these VEs have invested represent extraordinary dedication! Whether you are one of our VE Teams that tests once a week, once a month, or once a year, we want to express our warmest appreciation to all volunteers for your generous contribution to the ARRL VEC program.

If you are an ARRL VE, you can view your session stats online at www.arrl.org/ve-session-counts.
If you are not a VE, become one today! See www.arrl.org/become-an-arrl-ve.



Volunteer Examiner	Sessions	Accreditation Date	Volunteer Examiner	Sessions	Accreditation Date	Volunteer Examiner	Sessions	Accreditation Date
Atlantic			Hudson (continued)			Rocky Mountain		
Nelson Rotz, KC3PAP	724	30-Aug-22	John Kiernan, KE2UN	326	01-Jul-91	Robert Vosper, KZ1B	945	09-Jul-10
Donald Rees, K3PCT	550	28-Apr-23	Walter Lesnowich, W2EE	324	06-Mar-08	Thomas McCurdy, AJ7TM	471	26-Jun-18
Howard Gillott, KC3VJQ	367	24-Jan-24	Thomas Carrubba, KA2D	308	01-Sep-93	Robert Hamilton, N0RN	441	19-May-87
James McCloskey, NS3K	362	14-Nov-94	Robert Casino, N2GDY	300	03-Jun-08	Jeffrey Weinberg, W0QO	355	01-Apr-93
George Brechmann, N3HBT	328	01-Apr-91	Carlos Prior, KE2TT	284	01-Jun-90	David Avery, N0HEQ	302	13-Jan-88
Jobst Vandrey, AC0LP	324	23-Jun-08	Midwest			Gary Zabriskie, N7ARE	272	20-Nov-84
Arthur Clemons, N8BLK	310	01-Mar-01	Chris Hunt, N0YH	872	05-Aug-20	David Sharpe, K10HG	259	02-Feb-98
Edward Genoino, WA2NDA	298	10-Jul-85	David Bartholomew, AB0TO	821	22-Mar-02	Martin Soffran, NM5MS	240	21-Mar-94
Cully Phillips, N3HTZ	240	01-Sep-91	Ralph Waldren, N0OTS	779	03-Jan-20	David Bratcher, AK0MR	215	23-Sep-08
Michael Harla, N2MHO	228	12-Apr-06	Kevin Naumann, N0WDG	718	17-Nov-02	Zachary Gunyan, KE7WYG	205	06-May-24
Central			Harry Steger, W0HMS	687	26-Aug-08	Southeastern		
Dennis Keyfauver, K3DCK	509	29-Dec-22	Roland Kramer, W0RL	569	21-Jun-01	***Gary Pike, KA4KBX	10,823	28-Jun-90
Ed Wagner, AB9FN	437	01-Jul-02	Nick Catrow, N0DAD	445	31-May-17	***Justin Pike, KJ4AXF	8,879	12-Nov-12
Allan Bukowski, N9ZD	370	01-Jun-92	Kenneth Simila, KC0VMY	318	18-Feb-07	***Collin Pike, WE4RR	8,838	26-Apr-11
Eldon Boehm, NK9U	354	21-Nov-86	Edwin Berkel, AE0EB	282	06-Jan-15	***Anna Pike, KD4PCU	7,262	18-Aug-09
Donald Hlinsky, N9IU	347	01-Mar-91	John Mountain, KJ0MTN	256	28-Sep-09	***Patrick Pike, KJ4AXD	5,657	13-Oct-15
Brian Eder, WB9UGX	319	01-Jan-92	New England			**Ryan Krenzischek, W4NTR	2,099	04-Jan-13
Timothy Pechtold, AA9BV	286	01-Nov-92	**Paul Lux, K1PL	2,701	25-Jan-85	*John Reynolds, W4TXA	1,668	08-Jun-16
Frederick Baguhn, W9GOC	280	16-May-02	*Bob Phinney, K5TEC	1,718	20-Jan-14	*Tonja Jesko, WV2P	1,392	23-Aug-23
James Rinehart, K9RU	279	01-Aug-91	Robert Latippe, NC1RL	693	10-Mar-22	Stanley Whitfield, K4SHW	994	26-Sep-19
David Pritchard, W9QL	272	12-Apr-01	William Poulin, WZ1L	656	01-Sep-91	Robert Fauci, N1UVO	991	28-Mar-18
Dakota			Gregory Paul, KC1MND	548	03-Jun-20	Southwestern		
Jeffrey Goodnuff, W0KF	362	17-Jun-03	Phillip Temples, K9HI	520	12-May-89	*Bill Martin, AI0D	1,075	01-Nov-84
John Schwarz, AE0AL	337	26-Oct-94	Bruce Anderson, W1LUS	415	11-Feb-88	David Morrill, N7TWT	521	20-Jul-00
Shep Shepardson, N0NMZ	335	12-Mar-01	Robert Beaudet, W1YRC	413	01-Aug-90	William Peters, K1WMP	391	26-Jun-23
Joel Dunham, NC1D	287	26-Jul-23	Barbara Irby, KC1KGS	389	05-Aug-19	Pete Morrison, K6VVR	386	03-Apr-07
Douglas Nelson, AA0AW	264	01-May-90	Brandin Hess, WB1BR	376	24-Sep-15	Richard Buck, KC7OCT	373	21-May-97
Daniel Royer, KE0OR	261	01-Jul-91	Northwestern			Donald Kramer, WA6UVW	354	08-May-98
James Rice, N0OA	244	04-Dec-00	David Braucht, KK7QJK	721	01-May-24	Heather Parker, KM6Z	353	14-Feb-20
Robert Tracy, N0TC	209	30-Jul-86	Stephen Hutchings, WM7X	637	13-Apr-15	Bruce Zieminski, WA6BZ	321	25-Mar-02
Karl Erikson, WA2DEE	181	08-Jan-90	Peter DeKesles, KJ7IEA	622	22-Dec-22	Robert Smith, WB6ODR	294	10-Mar-99
Edward Van Cleave, W0VC	169	01-Jun-92	Mark Hunn, K17SI	557	20-Sep-18	Frank Westphal, K6FW	289	06-Sep-84
Delta			Erin Henrickson, ND7B	466	06-Jan-23	West Gulf		
*Elmer McKenzie, K5MCK	1,075	23-Dec-22	Scott Robinson, AG7T	462	01-Aug-91	**Franz Laugermann, K3FL	2,716	01-Dec-91
Terry Partigiani, W5TMP	918	27-Nov-07	Nathan Zane, KH6IHB	452	01-Apr-93	*Tanner Jones, W9TWJ	1,373	31-Jul-07
Loma Westmoreland, KU5J	835	31-Jan-21	Richard Morgan, KD7GIE	448	11-Aug-00	Daniel Quigley, N7HQ	793	24-Apr-20
Monvel Tandy Maskew, K9FQ	768	18-Jul-18	John Clarke, AC7WW	394	20-Jan-03	Jonathan Diner, N5JLD	702	16-May-11
Darrell Wiggins, W4AI	705	02-Jun-23	Loren Hole, KK7M	381	06-Sep-84	John Paterson, KC5LAA	634	16-Mar-09
Bryan McCammon, K15HAV	464	03-Sep-20	Pacific			Gerald Grant, WB5R	545	04-Jan-85
Rodney Webb, W4WRE	456	21-Mar-17	*Brian Torr, N6IY	1,088	06-Sep-00	Adolph Chris Koehler, K5VCR	536	29-Sep-95
Joshua Johnson, KC5JMJ	371	03-Jun-20	Morris Jones, AD6ZH	603	27-Nov-01	Gerald Crenshaw, WD4BIS	527	27-Feb-98
William Crowden, W4ETA	341	10-Jun-20	Dieter Stussy, KD6LVW	477	27-Jan-94	David Fanelli, KB5PGY	518	01-Oct-91
John Waters, KC5FYA	335	14-Sep-21	Neal Kernes, K3VG	409	07-May-24	Wilbert Cannonier, KK5JJ	475	03-Nov-95
Great Lakes			Larry Loomer, K16LNB	408	03-Dec-08	International		
*Charles Tyrrell, KE8PCB	1,626	03-Sep-20	Robert Perlman, W6BP	392	26-Aug-08	**Robert Girdo, AK2RG	2,046	27-Sep-17
*Bruce Osmon, KE8LT	1,587	16-Nov-18	Bill Nichols, NN7K	378	01-Sep-93	Gregory Croad, NN3Z	433	03-Jan-20
*David Potter, KE8OHG	1,496	03-Jun-20	Gordon Fuller, WB6OVH	363	06-Sep-84	Wayde Nie, AD2GX	365	13-Feb-24
Earl Paazig, W8BR	811	16-Apr-02	Jim Brunk, N6BHX	338	13-Jul-95	Vince D'Eon, AI7LK	226	13-Jan-21
William Bogle, KE8FZY	293	08-Jul-20	Dennis Simon, KB7UTV	321	10-Dec-13	Wesley Printz, W3SE	137	24-Feb-89
Charles Hall, W8HF	286	01-Jun-92	Roanoke			Kazuo Suzuki, N1KS	115	20-Apr-01
Lance Harvala, AB8Y	256	06-Nov-19	Richard Brannen, KA3JCA	372	25-Jan-89	Jay Oka, KH2J	111	01-Aug-91
Roger Weith, KE8QGV	252	28-Feb-22	Judy Friel, AC4RG	327	01-Feb-91	Yuri Kuwana, N1ENV	110	24-May-10
Stanley Arnett, AC8W	239	06-Sep-84	Terry Sanner, WV8V	267	06-Sep-84	Masatoshi Shimizu, AH6KY	109	07-Jul-09
Chris Anderson, K8VJ	235	09-Feb-90	William Smith, KQ1S	265	20-Jun-12	Masanori Kawakami, AI9C	96	04-Dec-97
Hudson			David Snyder, W4SAR	261	01-May-93			
Alan Crosswell, N2YGK	534	26-Oct-94	Larry Withrow, AF4HX	239	17-Dec-98			
Fritz Boigris, KB2O	498	26-Oct-84	David Poe, W8IW	228	13-Mar-07			
Jeremy Griffel, K2GRI	487	03-Dec-20	Edwin Williams, KN4KL	224	01-Jan-92			
Sid Markowitz, K2GG	468	27-Sep-94	John Kanode, N4MM	218	07-Jun-85			
Michael Abbey, KC2NJ	403	06-Jul-23	Maurice Brown, N8VA	195	31-Mar-97			

*Denotes participation in over 1,000 sessions.
**Denotes participation in over 2,000 sessions.
***Denotes participation in over 5,000 sessions.
****Denotes participation in over 10,000 sessions.

Congratulations to Elmer McKenzie, K5MCK, from Gloster, Mississippi (Delta Division), who is the latest VE to reach 1,000 session participation!

Celebrating Our Legacy

Uncovering My Call Sign's History

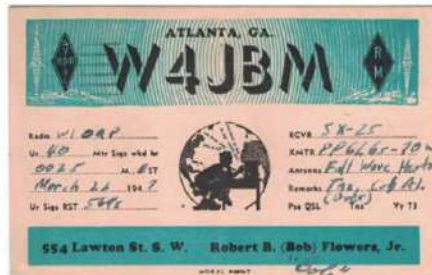
A few years back, I dug into the history of my vanity call sign, W4JBM. My search began with looking through old issues of *QST*, in which I found two mentions of the call sign in the "Station Activities" section of the January and July 1947 issues. But it wasn't until recently that I discovered a name. On eBay, someone was selling a vintage 1947 QSL card sent by Robert B. "Bob" Flowers, Jr., W4JBM — I quickly purchased it!

I searched the Census Bureau's online records and discovered that Bob was 9 years old in 1940, making him around 16 at the time the QSL card was sent. Next, I searched through scanned copies of the *Radio Amateur Callbook Magazine* on www.archive.org and found that Bob had moved around a bit, eventually settling in a new call district with a new call sign — WA2DUG; Scotia, New York.

Once I knew he had moved to a new city, I could search for more information. I learned that Bob followed in his father's footsteps and worked as an engineer for General Electric (GE). He was also a licensed pilot. Unfortunately, Bob died in a plane crash at the age of 37.

Parts of Bob's story resonate with me. Although I did not get my license as young as 9 years old, I did build my first crystal radio set when I was 6 or 7 and have been tinkering with radios ever since. My father and I also both held careers in electrical engineering, and my dad was working for GE when I was born in 1963.

Bob's 78-year-old QSL card is a reminder that although a lot has



The QSL card Robert B. "Bob" Flowers, Jr., W4JBM, sent after a QSO with W1OQP in March 1947.

been written about the history of ham radio, there are still many individual stories from decades past that remain uncovered.

Jim McClanahan, W4JBM
Bowdon Junction, Georgia

Never Losing Focus of the Ultimate Goal

I became curious about ham radio at a young age and always wanted to earn my FCC license. My uncle saw that I was interested in working with radios and electronics, so we built a crystal radio together. This sparked my quest to obtain all the information I could on the subject matter.

Later in life, one of my uncle's friends let me try out his transceiver. I couldn't afford to purchase one at the time, and I didn't have an amateur radio license yet, but these setbacks didn't stop me from obtaining used equipment like hand-held two-way radios, 21-channel CB radios, and Morse code keys with amplifier speakers to practice on.

When I entered the US Coast Guard as an electronics technician, I had to learn about marine band frequencies and how to work with all kinds of radio receivers. This meant I had to set aside my goal of getting my amateur radio license to focus on my specialty.

After my service in the coast guard, I pursued an electrical engineering degree at Purdue University and joined the Purdue Amateur Radio Club, W9YB, where I was exposed to the many facets of amateur radio. I tried to study for my amateur radio license and learn Morse code in between classes and labs, but my main motivation at this time was to graduate and find a career in medical electronics.

During my years of work in the medical telemetry field for several major electronic companies, like Hewlett-Packard, Agilent Technologies, and Philips, I gained a wealth of knowledge on the radio spectrum. Many of my co-workers throughout the years were amateur radio operators and had their FCC first-class licenses. They reassured me that I would obtain my amateur license one day and were kind enough to act as mentors. Finally, I achieved my Technician-class license, and, with encouragement from my mentors, I went on to pass the General and Amateur Extra exams.

Many of life's distractions caused me to veer off course, but the main key for acquiring my licenses was staying focused. I never stopped trying to attain my goal of acquiring an amateur radio license.

George Pazak, KD9FCI
Dyer, Indiana

Send reminiscences of your early days in radio to celebrate@arrl.org. Submissions selected for publication will be edited for space and clarity. Material published in "Celebrating Our Legacy" may also appear in other ARRL media. The publishers of *QST* assume no responsibility for statements made in this column.

Classic Radio

Hallicrafters Premium, General-Coverage Receivers

In 1951, Hallicrafters designed the S-76, a receiver that featured the first 50 kHz low-frequency intermediate frequency (IF) for improved selectivity using only inductive and capacitive components. Soon after, they constructed a group of general-coverage receivers that had this feature and built on the advances they made with the S-76.

Four Receivers that Built Upon 50 kHz IF for SSB

In 1954, the SX-96 used 50 kHz IF and combined the IF with the ability to select upper sideband (USB) or lower sideband (LSB). (This same year, the high-priced and rare SX-88 general-coverage receiver became available without that feature, but with two different high IFs to get continuous coverage from 535 kHz to 33 MHz by switching the first IF so it didn't fall in the frequency band covered. There weren't any later models of this receiver that had the same basic design.) The SX-96 led to the SX-100 in 1955, which also used the 1650 kHz first IF, a 50 kHz second IF, and two crystals at about 1600 and 1700 kHz to convert the first IF to the second IF, with the ability to change USB or LSB to the same sideband for processing by the 50 kHz high-selectivity final IF.

Using two crystals in the conversion between the 1650 kHz IF and the 50 kHz IF to select sidebands, a product detector, and automatic gain control (AGC) for SSB and CW was a major step forward in amateur radio receivers. The low-frequency final IF provided much of the benefit to Hallicrafters, Hammarlund,

National, and Radio Manufacturing Engineers (RME) ham-band and general-coverage receivers that were provided by mechanical filters (such as Collins Radio) or crystal lattice filters (such as Heathkit and many transceiver manufacturers) on other receivers.

The SX-100 went on to become the SX-111 in 1960, and the SX-122 in 1964. Both receivers used the same sideband selection system of the SX-96 and SX-100. Several other Hallicrafters receivers looked quite similar — the S-85, SX-99, and other single-conversion receivers — but they weren't premium models. The SX-122 made an important step forward following the S-76, SX-96, and SX-100; the SX-122 (and the later MK1 version of the ham-band-only SX-111) included a product detector for SSB and CW in addition to the AM diode envelope detector, plus AGC of CW and SSB.

Other Hallicrafters Models that Used Selectable Sideband

The 50 kHz final IF spread to many Hallicrafters receivers, not just the S-76, SX-96, SX-100, SX-122, and SX-111. It also found its way onto the SX-88, SX-101, SX-115, and SX-117; the SX-101, SX-115, and SX-117 all used two crystals to convert from the second-last IF to the final IF. See the sidebar "Noteworthy Dates in Hallicrafters History" for a timeline of their premium, general-coverage receivers.

R. L. Drake Built on 50 kHz with a Product Detector

R. L. Drake is most associated with a 50 kHz final IF for excellent and versatile selectivity for SSB and CW,



Hallicrafters S-76.



Hallicrafters SX-96.



Hallicrafters SX-100.

as well as AM and RTTY. While the 50 kHz IF first appeared on the Hallicrafters S-76 receiver in 1951, in 1957, the Drake 1A combined the 50 kHz IF for selectivity with a product detector, SSB, and CW AGC years before Hallicrafters added a product detector and AGC for vastly improved SSB and CW performance. All the Drake receivers that made the 50 kHz IF so popular followed in the footsteps of Collins Radio, with their historic 75A and 75A-1 of 1946; the advance was the use of a crystal-controlled first conversion and a tunable first IF, which was used on Collins Radio's 75A-1, 75A-2, 75A-3, 75A-4, 75S-1, all of their S-line equipment, the KWM-1, KWM-2, and KWM-380 transceivers, as well as Drake's 1A, 2A, 2B, 2C, R-4, R-4A, R-4B, R-4C, R-7, and R-7A, among other Drake products.

Other Manufacturers Adopt Low-Frequency IF

Hammarlund, National, and RME all eventually used the low-frequency IF idea. Hammarlund and National used Collins Radio's idea of crystal-controlled first conversion before going out of the amateur radio equipment business, as did Hallicrafters with the HT-44 and SX-117 and the HT-46 and SX-146 respective transmitter-receiver pairs, and the SX-115 receiver. Product detectors and AGC for CW and SSB also spread rapidly.



Hallicrafters SX-111.



Hallicrafters SX-122.

Noteworthy Dates in Hallicrafters History

1951 — Hallicrafters built the S-76, which established the benchmark for its successors, leading Hallicrafters to build off its design and create a group of general-coverage receivers.

1954 — Building off the S-76 design, Hallicrafters developed the SX-96, which used 50 kHz IF and combined the IF with the ability to select USB or LSB.

1955 — The SX-96 led to the SX-100, which used two crystals at about 1600 and 1700 kHz to convert the first IF to the second IF, with the ability to change USB and LSB to the same sideband for processing by the 50 kHz high-selectivity final IF.

1960 — The SX-100 went on to become the SX-111.

1964 — The SX-111 became the SX-122, which included a product detector for SSB and CW, in addition to the AM diode envelope detector and AGC of CW and SSB.

All photos courtesy of www.rigpix.com.

100, 50, and 25 Years Ago

September 1925

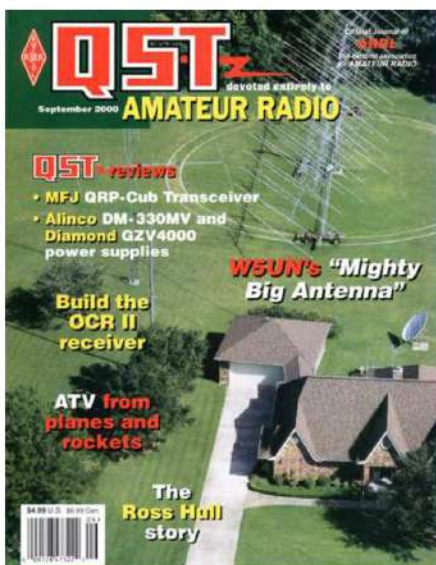
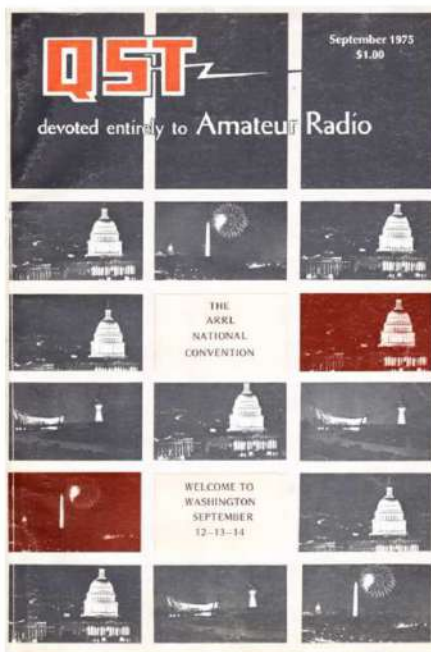
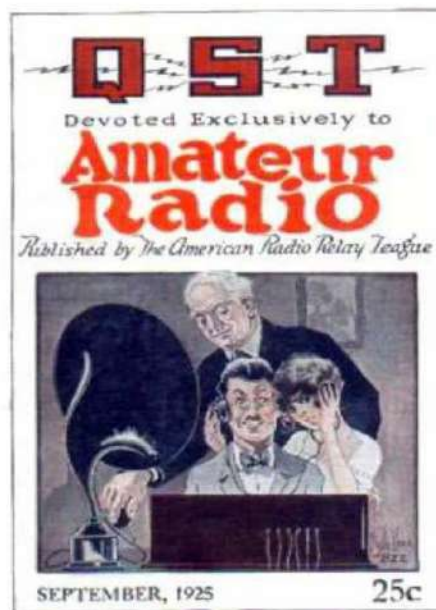
- Clyde Darr, 8ZZ, provides the cover art, which features a young couple sharing a pair of earphones to listen to the radio as the chaperoning father prepares to plug in the loudspeaker.
- In "Editorials: Election Time," Kenneth Warner, 1BHW, reports on the elections taking place; seven directors are elected to govern the Board by managing affairs, appointing officers, and determining policies.
- J. A. Mitchell reports on various methods for locating power leaks, including real line leaks and troubleshooting issues, in "Locating 'Power Leaks' by Radio."
- Many units are required in an average transmitting set. R. H. Chadwick lists them in "Transformers and Reactors in Radio Sets: Part 1."
- In "Who's Who in Amateur Wireless," W. M. Sutton, W. R. Pottle, and W. M. Rowan are appointed as the "Three New Canadian Division Managers."
- A. L. Budlong, 1ASN, states the monthly report of Seattle is meagre due to the absence of "heard" and "worked" stations in "The Month With NRRL."
- On May 30, the first general meeting of the French Section of the I.A.R.U. was held in Paris, recorded in "I.A.R.U. News."

September 1975

- The cover features an array of photos of Washington, DC, during the Bicentennial celebration.
- Raymond C. Petit, W7GHM, lists several reasons that a wider bandwidth for CW reception is commonly used in "Coherent CW: Amateur Radio's New State of the Art?"
- VHF enthusiasts learn the basics and mechanical details of building converters in "Construction Hints for VHF Converters."
- The electromagnetic pulse can damage radio equipment thousands of miles away, which is essential to radio amateurs, as understanding how to protect equipment can make the amateur a vital asset in the event of a catastrophe. Dr. C. R. Fisher, KØTYB/K4KGN; Dr. D. B. Nelson, and P. R. Barnes bring awareness to this in "EMP and the Radio Amateur."
- On July 16, Robert M. Booth, Jr., W3PS, delivered the League's comments and counterproposals to the FCC on behalf of ARRL's General Counsel, Dave Sumner, K1ZND, writes in "Restructuring."
- Pollution caused by heated air can be limited when using suitable CW abbreviations, notes Edward Biro, K6NB, in "Reducing Air Pollution."
- In "The World Above 50 Mc.," Bill Tynan, W3KMY, reports on amateur radio's role in emergency communications not being as effective above 50 MHz.

September 2000

- The cover features a view from the air, capturing the enormity of W5UN's "Mighty Big Antenna." Details can be found in "MBA: The Mighty Big Antenna," by David Blaschke, W5UN.
- In "It Seems To Us...Amateur Radio Resources for Learning," David Sumner, K1ZZ, discusses two initiatives to provide improved educational opportunities through Amateur Radio brought by the ARRL Board of Directors.
- Dan Wissell, N1BYT, reports on the design of the OCR II, a receiver that contains components of the popular SLR and OCR, in "The OCR II Receiver."
- The first and most versatile airborne ATV transmitter was designed as a self-contained unit that could be easily attached to any suitable model airplane using rubber bands; Steve Cerwin, WA5FRF, shares the details in "Amateur Television from Model Planes and Rockets."
- Australian-born amateur Ross Hull is highlighted as one of the greatest VHF and UHF pioneers of the 20th century in "The Ross Hull Story," by Eric Jamieson, VK5LP.
- The 14th School Club Roundup continued throughout the school year, and more than 900 student operators were able to participate, as shared by Lew Malchick, N2RQ, in "School Club Roundup, 2000."



Silent Keys

It is with deep regret that we record the passing of these radio amateurs:

W1ARK KC1AUU ♦♦K1BUB N1DCG ♦KA1DE ♦KA1EPI K1EQD ♦K1HCY WA1HEW K1ISR W1JWN ♦♦♦KD1K ♦KC1KO N1MNX ♦KB1QGL ♦K1RFO ♦N1RMP K1TSV ♦N1UZ K1WMS W2HR ♦W2IM W2IOG WB2IVM W2KEN N2NO N2QJM	King, Robert W., Salem, OR Klane, Laurence, Sharon, MA Gravel, Robert E., Westfield, MA Murray, Wayne R., Jr., Deerfield, NH Thompson, Hosmer, Swanzey, NH Grimaldi, Albert, Windsor, CT Smallwood, Darryl F., Patten, ME Clements, Antoinette B., Charlotte, VT Dowling, Craig R., York, PA Simonian, Edward C., Youngsville, NC Noble, John W., Sr., Agawam, MA ♦♦♦KD1K ♦KC1KO N1MNX ♦KB1QGL ♦K1RFO ♦N1RMP K1TSV ♦N1UZ K1WMS W2HR ♦W2IM W2IOG WB2IVM W2KEN N2NO N2QJM	KY4S W4SW KD4YCM KJ4YTO ♦KZ5AT ♦KD5DE ♦N5FH ♦W5GZT N5IFR KG5JF ♦WB5ISO ♦K5JTM ♦WB5JW W5KQJ ♦W5LG KE5MKU ♦♦W5MQ ♦KD5NFE W5NQ KA5OCS ♦AF5PK K5TJR N5TWR ♦♦♦N5TY N5UJC ♦KF5VE W5WBT ♦♦KB5WI ♦KD5WTM ♦N5XIJ ♦KY5Z KD5ZBZ N6DCC ♦♦WA6HPW ♦KK6KPO ♦WB6MIE KA6MQP KG6OBQ ♦AD6OI KC6OJW K6REL ♦N6XWF ♦K7AOP WA7AQH ♦♦N7CEU ♦KL7FHK ♦AB7HB KA7JUM ♦♦WA7LEV ♦KE7NNW KE7NRA WB7PTI WU7Q K7SRD KK7UF ♦KF7VKW ♦KD7VWE W7ZI ♦W7ZRR WD8CAB WD8CKA ♦WO8D N8FDW	Pajerski, Eugene L., Aiken, SC Keiser, Bernhard E., Vienna, VA Abbott, Norris E., North Chesterfield, VA Lewis, Ricky L., Sr., Martinsville, VA Bennett, Arden L., Jr., Oceanside, CA Sojka, Charles M., Shreveport, LA Hoskins, Floyd L., Houghton, LA Schrivener, Rod, Kearney, MO D'Elia, Michael J., Georgetown, TX Taylor, Steve G., Spurger, TX Cochran, Wendell F., Oklahoma City, OK McCrocklin, James T., Marble Falls, TX Hock, Leslie B., Houston, TX Smith, Lilburn R., Fort Worth, TX Hauschulz, Doyle W., Las Vegas, NM Hathaway, Joe, Midland, TX Tomlinson, Ben R., Lonoke, AR Evatt, Jerri J., Mansfield, AR Deer, Raymond D., Sr., Sallisaw, OK Rockow, Leslie W., McGregor, TX Hale, Gerry C., Azle, TX Robertson, Thomas J., Daingerfield, TX Falgout, Sanders J., III, Lafayette, LA Knudson, Kenneth D., Godley, TX Kent, William J., Corrales, NM Hewett, Joe D., Longview, TX Maddux, Joe T., Angels Camp, CA Hebert, Weston L., Kaplan, LA Clawson, John A., Honobia, OK Christian, Arthur R., Boynton, OK Priest, Robert, Abernathy, TX Ellis, Ike L., Farmersville, TX King, Ricci A., Sacramento, CA Hagee, Charles R., Mooresville, IN Hill, Michael J., San Francisco, CA Dinkel, Anthony O., Umpqua, OR Brazier, Philip J., Sr., Fort Worth, TX Cannon, Craig M., Elko, NV Peschel, Heiko, Foothill Ranch, CA O'Brien, Michael T., Venice, CA Lueck, Richard E., Concord, CA Baker, Danny L., Oriental, NC Panattoni, Jerry L., Yakima, WA Morissette, Donald D., Nine Mile Falls, WA Cook, Alan V., San Antonio, TX Levandowski, Martin F., Montague, MI Fineberg, Bernard J., Kennewick, WA Dodge, Norman E., Seattle, WA Vancil, Lloyd E., Lebanon, OR Johnson, Peter T., Stanwood, WA Pulsipher, Ronald E., McCleary, WA Ray, James D., Phoenix, AZ Flud, William M., Adams, TN Safranek, Kenneth R., Spokane, WA Maden, Michael A., Tonasket, WA Town, George E., Cowiche, WA Pace, Dan H., American Fork, UT Huey, Michael J., Beaverton, OR Stimmel, Monty C., Spokane, WA Momborg, Scott D., Cincinnati, OH Harvey, Zachary S., Moundsville, WV Hudson, Herman A., Muskegon, MI Suder, Stacy I., Buckhannon, WV	♦KC8FJO ♦NB8H KC8MFT ♦N8MPU ♦KC8SDL N8TTR N8TVI W8UEE ♦N8WBP ♦N9BL ♦♦K9HBG W9IPV K9JWJ KB9LVI KB9MPD N9MSL ♦KB9ON K9OTY KC9RFO WB9RQU K9SGK KC9TEW KB9UXH W0ERE ♦K0FOG K0GIK ♦KD0GIX KA0GMY KA0GRP ♦WD0HDV KC0IDF ♦♦KC0J ♦♦W0JAD N0JW ♦KD0KHT KC0KTI KD0TG ♦WA0TJT KB0TOT ♦N0URL W0WDC N0YSZ	Hall, Alvin E., Cincinnati, OH Running, Thomas M., Cincinnati, OH Gorsuch, Elizabeth A., Lindsie, WV Smith, John P., Allegan, MI Hall, Robert, Jr., Bay City, MI Chowning, Michael, Cincinnati, OH Nikel, Scott E., Harrison Township, MI Adams, John V., Fairfax Station, VA Peirano, William B., Cincinnati, OH Charles, Thomas L., Oshkosh, WI Waters, Leon, Jr., Paris, TN Sanstrom, David D., Saint Joseph, IL Mahuron, Jimmy G., Salem, IN Kimmel, Quintin L., Woodlawn, IL Dahlberg, Verner G., Grantsburg, MN Coe, Judith G., Indianapolis, IN Gleeson, James, Plainfield, IL Schaal, Dennis A., Platteville, WI White, Wendel W., Griggsville, IL Nolan, Richard A., Kohler, WI Cook, Stephen O., Indianapolis, IN Kohn, Jeff S., Schererville, IN Billingsley, Charles R., Sr., Lacon, IL Gallo, Allan C., Nixa, MO Jones, Reed H., Mt. Pleasant, IA Ross, Hal, Wichita, KS Croy, Paul H., Cedar Rapids, IA Mowels, Steven G., Sr., Raleigh, NC Pearson, Brian G., Wellington, FL Joynt, Delores, Roseland, NE Eckler, Louis J., Tonganoxie, KS Gustafson, Robert P., St. Genevieve, MO Davis, James A., Renton, WA Knox, Dick J., Thornton, CO Coiner, Lawrence R., Olathe, KS Duehr, Karen, Elizabeth, CO Herman, Doug, Iowa City, IA Kaiser, Keith D., Kansas City, MO Digby, Charles B., Leawood, KS Wilson, Robert, Sioux Falls, SD Becker, Beverly M., Cedar Rapids, IA Pearson, Sonia G., Saint Joseph, MO
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The July 2025 Silent Key column listed Winfred L. Morris, Jr.'s, AD6C, hometown incorrectly. The listing should read: Winfred L. Morris, Jr., AD6C, Thousand Oaks, CA

- ♦ ARRL Life Member
- ♦ Current Diamond Club
- ♦ Maxim Society
- ♦ Veteran
- ♦ Former call sign

For information on how to list a Silent Key in QST, please visit www.arri.org/silent-key-submission-guidelines.

Note: Silent Key reports must confirm the death by one of the following means: a copy of a newspaper obituary notice or death certificate, or a letter from the family lawyer or executor. Please be sure to include the amateur's name, address, and call sign. Allow several months for the listing to appear.

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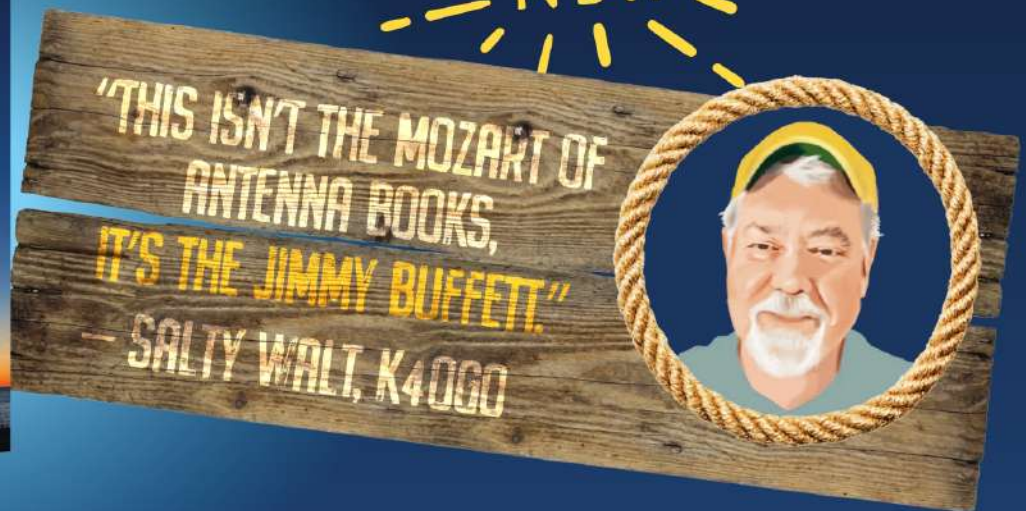
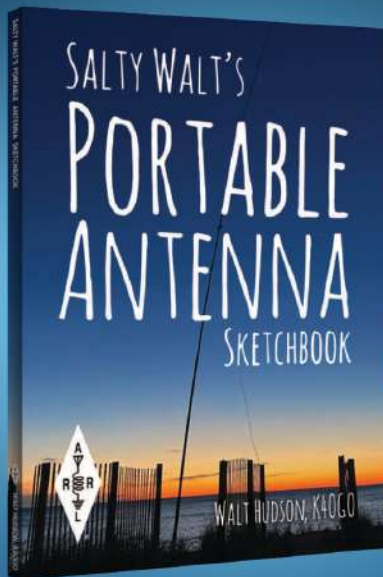
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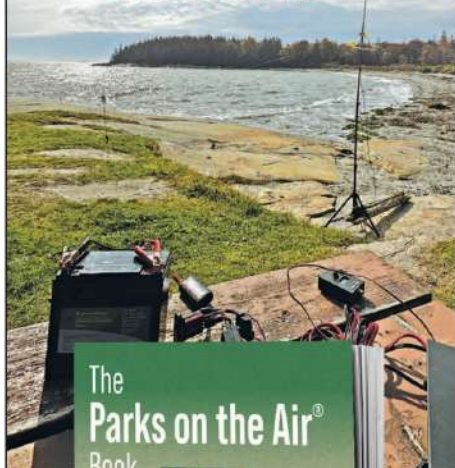
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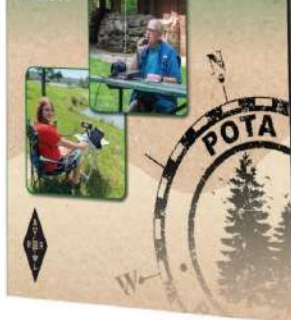
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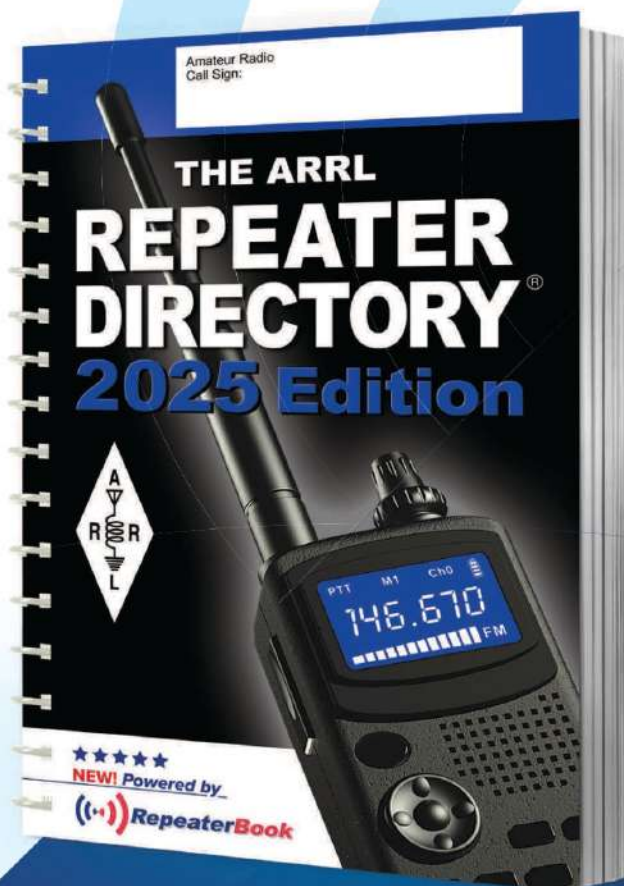
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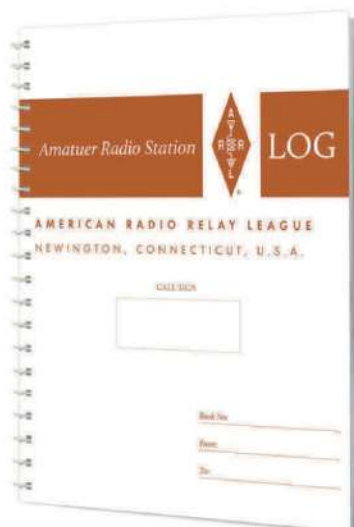


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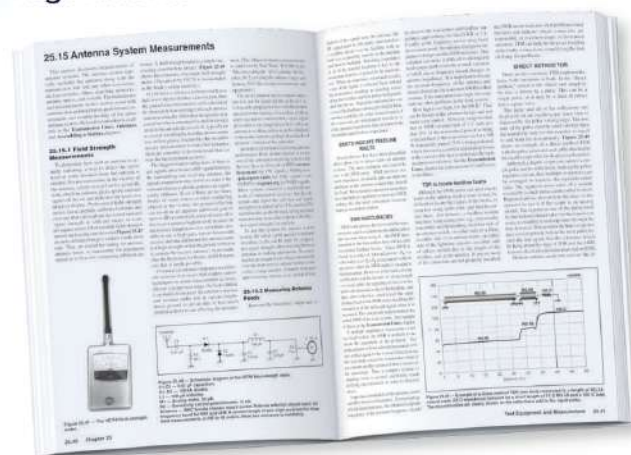


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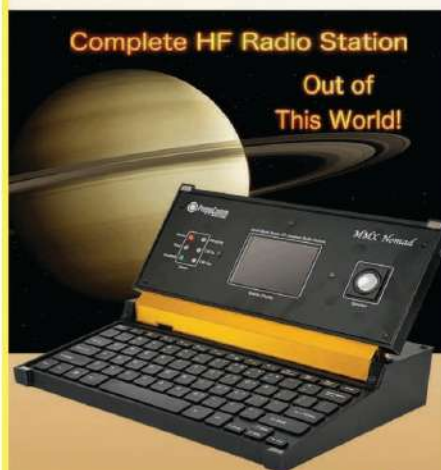
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Power Rating	1.5KW (1.8~60MHz) 1KW (144MHz)	2KW (1.8~60MHz) 1KW (144MHz)	200W (140~525MHz)
Tolerance	±10% at Full Scale	±10% at Full Scale	±10% at Full Scale
SWR Measurement	1:1~1:∞	1:1~1:∞	1:1~1:∞
SWR Detection Sensitivity	4W MIN	4W MIN	4W MIN
Input/Output Impedance	50 ohms	50 ohms	50 ohms
Input/Output Connectors	SO-239	SO-239	SO-239 or N-Type

CN-501 Economy Series

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Power Range: Forward	20/200/2KW	30/300/3KW	20/200W	2/20W
Tolerance	±10% at Full Scale	±10% at Full Scale	±10% at Full Scale	±10% at Full Scale
SWR Measurement	1:1~1:∞	1:1~1:∞	1:1~1:∞	1:1~1:∞
SWR Detection Sensitivity	5W MIN	5W MIN	5W MIN	0.4W
Input/Output Impedance	50 ohms	50 ohms	50 ohms	50 ohms
Input/Output Connectors	SO-239	SO-239	SO-239 or N-Type	N-Type

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Connector: SO 239
Output Port: 2



CS-201GII

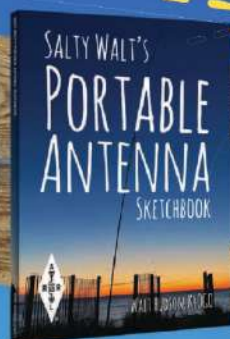
Frequency Range (up to): 2 GHz
Power Rating:
 1.5 kW CW (up to 30 MHz)
 250 W CW (up to 1 GHz)
 150 W CW (up to 2 GHz)
VSWR: Below 1:1.3 at 1.3 GHz
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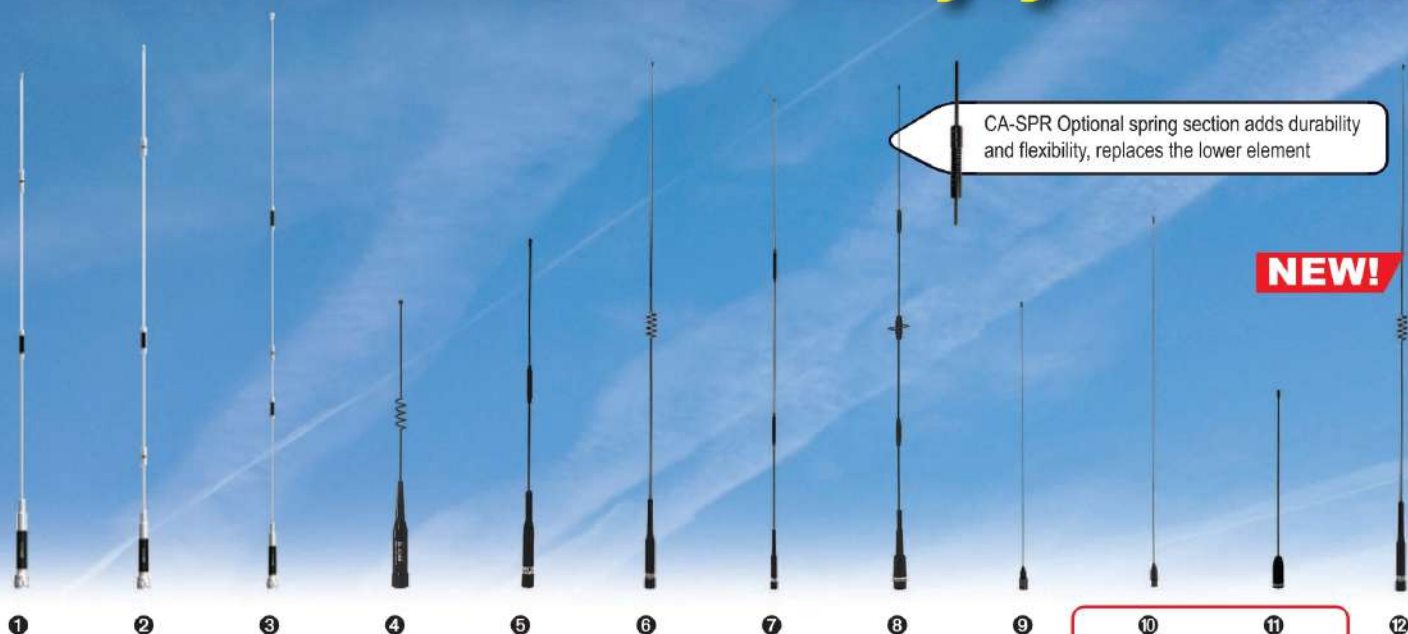


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3 COMET CSB-790A DUAL-BAND 2M/440MHz w/FOLD-OVER

2M: 7/8 wave center load • 440MHz: 5/8 wave x 3 center load • VSWR: 1.5:1 or less • Length: 62" • Conn: PL-259 • Max Pwr: 150W

4 COMET B-10/B-10NMO DUAL-BAND 2M/440MHz

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5 COMET SBB-2/SBB-2NMO DUAL-BAND 2M/440MHz

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6 COMET SBB-5/SBB-5NMO DUAL-BAND 2M/440MHz w/FOLD-OVER

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7 COMET SBB-7/SBB-7NMO DUAL-BAND 2M/440MHz w/FOLD-OVER

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11 COMET SMA-503, SMA-503J DUAL BAND 2M/440MHz HT ANTENNA

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