



The RELAY)))

DECEMBER 2022



The Official Publication of the Arrowhead Radio Amateur Club

A.R.A.C. Inc.

P.O. Box 7164 Duluth MN 55807-7164

<http://www.thearac.org>

Dues: Member \$20/Family \$25

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Holiday Gift Ideas & Buying Guide 2022 Editors' Pick: Heil Pro 7 Headset

Sound quality is critical in ham radio. **Bob Heil's** lifetime of innovation in audio technology has set the standard in concerts, home theater systems and broadcast media. An amateur radio operator since his teens, Bob-K9EID naturally also developed superior audio products for ham radio.

Founded in 1966, **Heil Sound** has a division called Heil Ham Radio, an excellent resource for headsets, microphones, receive audio, booms, mounts, accessories and adapters. Though we mentioned last year's Heil Pro 7 BU headset in our Accessories page, this year's newly updated Heil Pro 7 is our favorite Holiday Gift Pick of 2022. Here's why:

The Heil Pro 7 is an aviation-style headset designed for amateur radio use in high-noise environments. The specially designed foam-gel ear pads provide 26 dB outside noise reduction and provide exceptional comfort. A true dual-channel, stereo headset, the Pro 7 features an audio balance control that allows the user to adjust the level of the left earphone to match the right. A unique phase-reversal switch greatly helps the listener "dig out" weak signals. The latest version of the Pro 7 features a monitor jack, which allows a second operator to plug in headphones and monitor audio.

The flexible gooseneck mic boom on Pro 7s may be rotated for use on either the right or left ear. Two production versions are available, depending on whether you require a dynamic or electret microphone element. However, the microphone elements are easily interchangeable, allowing you to swap out elements to be used with different rigs or for contesting or DX purposes. Replacement elements are available in full-range iC Electret, full-range Dynamic, and DX Narrow contesting options for \$69 each. Pro 7 headsets include the following accessories:

- Large PTT Switch
- Military grade straight cable
- Military grade coiled cable
- Extra set of ear pads
- Removable and washable cotton ear pad covers.

The balance control located on the left speaker controls the left speaker. To use, set a comfortable right side level with the AF gain of the receiver. You can then adjust the left side speaker where necessary to balance the audio between the speakers. In most cases, the balance control will be close to maximum. Visit HeilHamRadio.com for additional information on technical specifications, as well as well as matching the correct cables to your radio. *More Holiday Gift Ideas are continued on Page 14...*



HEIL PRO 7 Dynamic or Pro 7 iC

Available in Blue or Black, with your choice of a low distortion dynamic HC-7 microphone element or the Heil iC electret microphone element.

\$299.00 at HeilHamRadio.com

The Relay Co-Editors:
Kim & Steve Waller

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WINTER 2022

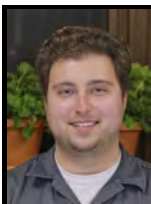
ARAC Board Meeting - November 1, 2022

PRESIDENT



N0VRM
Gene Ellefsen
3710 Chambersburg Ave
Duluth, MN 55811
218-390-3272
Ispitech@mail.com

VICE PRESIDENT



K0DJP
David Pyrlík

david.pyrlík@gmail.com

SECRETARY



KF0GJW
Melinda Nelson

TREASURER



KN0NUL
Bruce Carlson
906 Anderson Rd
Duluth, MN 55811
763-315-2967
carlsbr@gmail.com

3RD YEAR BOARD



KD9ABS
Gary Minter
1621 N 26th St
Superior WI 54880

2ND YEAR BOARD



AA0AC
Dave Davis

218-348-6649
aa0ac@outlook.com

1ST YEAR BOARD



AA0AW
Doug Nelson

aa0aw@arrl.net

Board Members

Gene Ellefsen – N0VRM, Dave Pyrlík – K0DJP, Bruce Carlson – KN0NUL, Gary Minter – KD9ABS, Melinda Nelson – KF0GJW, Dave Davis – AA0AC, Grant Forsyth – KC0WUP

Board Advisors (Non-Board Members)

Randy Wabik – KR0B

Guests: Elmer Berg – KC0NGY, Del Minter – KE0CLI

Meeting called to order by President Gene – N0VRM at 18:35 (6:35 pm)

Minutes:

Minutes were sent via email. Motion to approve Doug Nelson – AA0AW, Seconded by Gene Ellefsen – N0VRM, motion passed.

Treasurer's Report:

Checking: \$1,068.32

Savings: \$2,374.93

Repeater: \$4,667.26

Subtotal Cash \$8,110.51

Winter CD: \$1,730.42

Summer CD: \$0.00

Subtotal CD: \$1,730.42

Assets Subtotal: \$9,840.93

Motion to approve by Doug Nelson – AA0AW, seconded by Melinda Nelson – KF0GJW, motion passed.

if you are looking to test or upgrade, please contact Doug Nelson at AA0AW@arrl.net

Christmas Party:

Christmas party will be held December 8th at 18:00 (6:00 pm), In the past we have done up to \$300.00 for food, and \$100.00 in prizes. Will also have elections at this meeting.

- ♦ Motion made to spend up to \$300.00 for food by Melinda Nelson – KF0GJW, seconded by Gary Minter – KD9ABS, motion approved.

Continued on Page 3

ARAC Board Meeting continued

- ◆ Motion made to give \$100.00 in cash prizes by Bruce Carlson – KN0NUL, seconded by Gary Minter – KD9ABS, motion approved.
- ◆ Potluck – please bring a dish to share and any perishable food to donate.

Bell Ringing:

Thursday December 15th. Please feel free to dress up sing carols. Just have fun. There is a sign-up sheet. If you are interested, please let Gene Ellefsen – N0VRM know.

Repeater:

Randy Wabik – KR0B, Will be ordering the controller tomorrow 11-2-2022. Will also be looking at buying a new UPS as the one that was donated to the club is 9 years old already. About \$400 for the UPS and \$325 for the controller.

Testing:

Had a testing session last Sunday for Wendy Stanford – KO4YJO. Sent out on the nets that if anyone was interested, we would also take them in and there was no interest. Will have a test for the Technician Class in January. As always if you are looking to test or upgrade, please contact Doug Nelson at AA0AW@arrl.net

Education:

Class is on Tuesday's.

Old Business:

- ◆ ARRL Club Grant – Gene is still working on the application for the second round of grants.
- ◆ 501C3 – Still working on the application.

Motion to adjourn by Doug Nelson – AA0AW, seconded by Bruce Carlson – KN0NUL, motion passed at 19:04 (7:04 pm)





ARAC Club Meeting Minutes

November 10, 2022

Present:

President: Gene Ellefsen – N0VRM
Treasurer/Membership: Bruce Carlson – KN0NUL
Secretary: Melinda Nelson – KF0GJW
First Year Board: Doug Nelson – AA0AW
Second Year Board: Dave Davis – AA0AC
Special Events: Open/Gene Ellefsen – N0VRM (acting)
Parliamentarian: Grant Forsyth – KC0WUP
Repeater: Dave Pyrlík – K0DJP
Testing: Doug Nelson – AA0AW
Repeater: Randy Wabik – KR0B
HamFest/Education: Bob Schulz – KC0NFB

Absent:

Vice President: Dave Pyrlík – K0DJP
Third Year Board: Gary Minter – KD9ABS
Property/Picnic: Scott Ahlgren – N0VYU
Chaplin:
Web Site: Thomas Dorr – KE0RHA
Newsletter/Historian: Kim Waller – KE0NQS
Newsletter/Historian: Scott Waller – KE0NQT

Meeting called to order at 19:04 (7:04 PM) by President Gene Ellefsen – N0VRM. Thirty-two (32) members in attendance.

Minutes:

Minutes are posted on the website and in the newsletter.

Treasurer's Report:

Checking: \$1,068.32
Savings: \$2,374.93
Repeater: \$4,667.26
Subtotal Cash \$8,110.51

Winter CD: \$1,730.42
Summer CD: \$0.00
Subtotal CD: \$1,730.42

Assets Subtotal: \$9,840.93

Are there any questions? No questions. Motion to accept as presented by Doug Nelson – AA0AW, seconded by Robert Schulz – KC0NFB, motion passed.

Christmas Party:

Meeting will be on December 8th start at 18:00 (6:00 PM)

Board approved the following:

Up to but not exceed \$300.00 for food. John Pouchak – AA0JP. Motion passed.

Up to but not exceed \$100.00 for prize. Dave Davis – AA0AC. Motion passed. (The board will be handing out cash for these prizes and you may only win once.)

Please bring any perishable food that you want to donate for the food drive.

Continued on Page 5



ARAC Club Meeting Minutes, continued

Education:

Bob Schulz – KC0NFB – Nothing new to report. New class information to come in February.

Testing:

Doug Nelson – AA0AW there will be a testing session January 10th. We had an upgrade from Technician to General a little over a week ago. If anyone needs testing contact Doug Nelson at AA0AW@ARRL.net and they will test individually. **Do not forget to get your FRN number prior to testing.** You can go to FCC.gov/uls and register. You will also need an email address going forward.

Repeater:

Randy Wabik – KR0B, ordered the controller for Mahtowa. David Pырlik – K0DJP found an amplifier and donated to the club. Dave Davis – AA0AC found a UPS to donate to the club as well. After the 1st of the new year will look into servicing the generator.

Salvation Army Bell Ringing:

We will be doing bell ringing on December 15th from 11:00 am to 20:00 (8:00pm) at the Burning Tree Plaza Super One Foods. There is a sing-up sheet. If you are planning on ringing bells, please have fun, dress up in holiday spirit. If you are interested, please contact Gene Ellefsen – N0VRM.

Nominations for Board of Officers and Board Members:

President: Nomination of Gene Ellefsen – N0VRM

Vice President: Nomination of Dave Pырlik – K0DJP

Treasurer/Membership: Nomination of Sam Fray – KE0YTM

Secretary: Nomination of Melinda Nelson – KF0GJW

First Year Board Member: Nomination of Gary Minter – KD9ABS, Dennis Anderson – W0DIO, Jon Nelson – N0UOZ

Also looking for a nomination for the Thomas J Reibold Award W9IBM Memorial Award for someone who goes above and beyond to promote amateur radio here in the Twin Ports. If you know someone who deserves that please submit your nomination in writing to a board member.

New Business:

Dues are due – you can start paying now to Bruce Carlson – KN0NUL

Looking for Net Control Operators.

Door Prize was won by Paul Gilsdorf – KF0GEX

Motion to adjourn by Doug Nelson – AA0AW, seconded by Robin Davis, motion passed at 19:33 (7:33 PM). Program was a from ARRL representative Bill Lippert – AC0W, Dakota Division Director.





Prez Sez ...

HO HO HO MERRY CHRISTMAS!

Thursday, December 8 is the Annual ARAC Christmas Party! Starting at 6:00 PM, we'll have our Business meeting with the Election of Officers. We have 3 people running for First Year Board:

| | |
|-----------------|--------|
| Dennis Anderson | WØDIO |
| Jon Nelson | NØUOZX |
| Gary Minter | KD9ABS |

After the Elections we will enjoy the Pot Luck meal, so please bring your favorite dish to share. The Club will provide Meat & Cheese Trays, so come and enjoy some fellowship and good times.

Gene Ellefsen NØVRM



LOOKING for an Amateur Radio License TESTING SESSION?

Schedule your own Testing Session TODAY!

Contact Doug Nelson-AA0AW at aa0aw@arrl.net or 218-391-5874

All Exam Candidates are REQUIRED to have an FCC Registration Number (FRN) before exam day, which will require your email address.

Not Currently Licensed? For New License Candidate FRN registration: go to www.fcc.gov/new-users-guide-getting-started-universal-licensing-system-uls

Upgrading to General or Expert Class & not sure you have an FRN number? go to <https://wireless2.fcc.gov/UlsApp/UlsSearch/searchLicense.jsp>

Upgrade Candidates: Please bring a copy of your current license to the exam session.

CW Abbreviations

- | | | | |
|--------------------------|-------------------|--------------------------|-------------------|
| AR End of Message | AS Pse QRX | BK Back to You | SK End of Contact |
| TU Thank You | PSE Please | K Invite to Transmit | |
| QST Calling all Amateurs | QRL Are You Busy? | QRU Have anything for me | |
| QRV Are You Ready? | QRX Standby | QRS Transit Slower | |

| | | | | | |
|---|---------|---|----------|---|-----------|
| A | ●■■■ | M | ■■■■ | Y | ■■■■● |
| B | ■■■■● | N | ■■■● | Z | ■■■■●● |
| C | ■■■■●● | O | ■■■■■ | 1 | ●■■■■■ |
| D | ■■■■●●● | P | ■■■■●● | 2 | ●●■■■■■ |
| E | ● | Q | ■■■■●●● | 3 | ●●●■■■■■ |
| F | ●●■■■■ | R | ■■■■●● | 4 | ●●●●■■■■ |
| G | ■■■■●● | S | ●●● | 5 | ●●●●● |
| H | ●●●● | T | ■■■ | 6 | ■■■■●●●● |
| I | ●● | U | ●●■■■ | 7 | ●●●●●● |
| J | ■■■■■■■ | V | ●●●■■■ | 8 | ■■■■■■■● |
| K | ■■■■●●■ | W | ■■■■●●● | 9 | ■■■■■■■●● |
| L | ■■■■●●● | X | ■■■■●●●● | 0 | ■■■■■■■■■ |



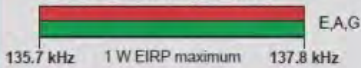
US Amateur Radio Bands

US AMATEUR POWER LIMITS

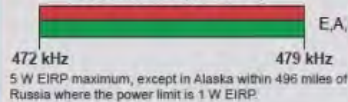
FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

On March 28, 2017, the Federal Communications Commission adopted rules that will allow Amateur Radio access to 472-479 kHz (630 meters) and to 135.7-137.8 kHz (2,200 meters). However, amateurs cannot use these frequencies until 30 days after the Report and Order is published in the Federal Register and the final procedures for registering stations with the Utilities Telecom Council (UTC) have been approved and announced. At the time this chart was created, the Report and Order had not been published and the UTC online registration site is not yet available. Follow ARRL news for further information. New charts will be published at www.arrl.org/graphical-frequency-allocations when the bands are fully available for use.

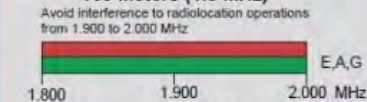
2,200 Meters (135 kHz)



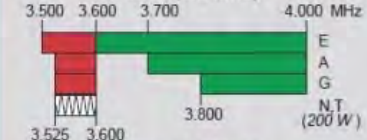
630 Meters (472 kHz)



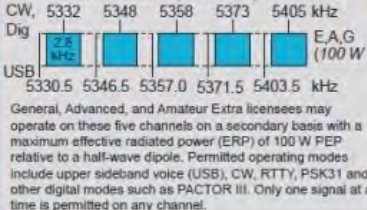
160 Meters (1.8 MHz)



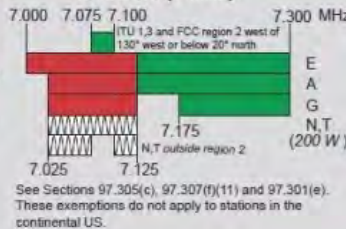
80 Meters (3.5 MHz)



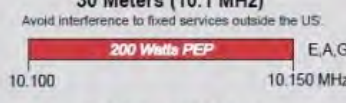
60 Meters (5.3 MHz)



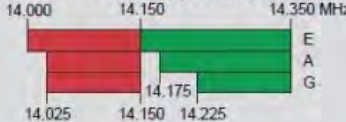
40 Meters (7 MHz)



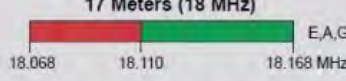
30 Meters (10.1 MHz)



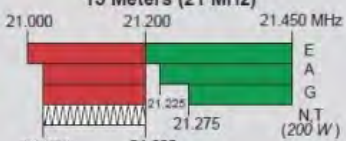
20 Meters (14 MHz)



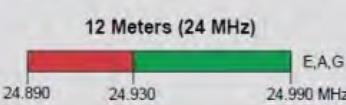
17 Meters (18 MHz)



15 Meters (21 MHz)



12 Meters (24 MHz)



Effective Date for
2,200 and 630 Meters
to be announced



ARRL The national association for
AMATEUR RADIO

KEY

Note:
CW operation is permitted throughout all amateur bands.

MCW is authorized above 50.1 MHz, except for 144.0-144.1 and 219-220 MHz.

Test transmissions are authorized above 51 MHz, except for 219-220 MHz.

- = RTTY and data
- = phone and image
- = CW only
- = SSB phone
- = USB phone, CW, RTTY, and data
- = Fixed digital message forwarding systems only

- E = Amateur Extra
- A = Advanced
- G = General
- T = Technician
- N = Novice

See **ARRLWeb** at www.arrl.org for detailed band plans.

ARRL We're At Your Service

ARRL Headquarters:
860-594-0200 (Fax 860-594-0259)
email: hq@arrl.org

Publication Orders:
www.arrl.org/shop
Toll-Free 1-888-277-5289 (860-594-0355)
email: orders@arrl.org

Membership/Circulation Desk:
www.arrl.org/membership
Toll-Free 1-888-277-5289 (860-594-0336)
email: membership@arrl.org

Getting Started in Amateur Radio:
Toll-Free 1-800-326-3942 (860-594-0355)
email: ncwham@arrl.org

Exams: 860-594-0300 email: vec@arrl.org

*Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.

‡ No pulse emissions

All licensees except Novices are authorized all modes on the following frequencies:

| | | |
|---------------|-----------------|-------------------|
| 2300-2310 MHz | 10.0-10.5 GHz ‡ | 122.25-123.0 GHz |
| 2390-2450 MHz | 24.0-24.25 GHz | 134-141 GHz |
| 3300-3500 MHz | 47.0-47.2 GHz | 241-250 GHz |
| 5650-5925 MHz | 76.0-81.0 GHz | All above 275 GHz |

NETS

Have a favorite HF/6m/2m/1.25m/70cm net that you check into or listen in on? Also, please send corrections and we will add it to the list below - Kim KEØNQS at my email KEØNQS.mn@gmail.com.

- **Northland Weather Group Net:** Mondays 2000 on the ARAC repeater (146.940 MHz with a tone of 103.5 and standard offset).
- **Minnesota D-Star Net:** Sundays at 19:30 on Reflector 53A
- **Minnesota Section Net** 1200 and 1730 on 3.860 [Net Manager: NØYR] http://www.mn-section.org/dept_stm.html
- The non-non-net: Evenings 2000 144.200 USB except for Sunday evenings.
- Badger WX Net: 0500-0715 on 3.985. Give 24 hour high/low/current temperature, precipitation and snowfall.
- **PICONET:** 3.925 from 0900-1100 CT Mon-Sat and 1600-1700 CT Mon-Fri. Info at: <http://www.piconet3925.com>
- Michigan Upper Peninsula Net: 1600 (CST) on 3.921 MHz Sun-Sat and 1200 Sun. Info: <http://www.michupnet.com>
- Great Lakes Marine/Maritime Mobile Net: Morning 07:30 - 3.932; 08:15 - 7.261 MHz and evening 18:30 - 3.1730927; 19:15 - 7.268 MHz. Weekend extra net: 10:00 - 7.261/7.268 MHz. All CST, LSB and +/- QRM. See: <http://www.sailblogs.com/member/glimmnet/>
- MIDCARS: 07:30-13:00 - 7.258 MHz. See: <http://www.midcars.net>
- Iowa snowbird net on 14.257MHz, M-W-F at 10:00 am Local Time. This is an open net.
- Spider Web Net (Marco Island FL) on 14.347 every morning at 0730 CST/CDT: <http://www.spiderwebnet.net>
- Maritime Mobile Service Network: Daily at 1100—2100 Central on 14.300. <http://mmsn.org> and <http://www.14300.net>
- RV Radio Network: Every day at 1900 Central on 7.265 MHz. Web site: <http://www.rvradionetwork.com>
- Upper Midwest Ten Meter Net: Every Thursday Evening @ 8 PM – 28.480 MHz USB
- Wisconsin Sideband Net: Daily @ 5:15 PM – 3985 [or 3982.5] KHz LSB
- Hobby Helpers Net - Tuesday @ 8 PM – 28.330 MHz USB (Isanti MN) LSB [Net Manager: WOØA].
- Northstar Trader Net: 3.908 +/- at 0830 CST Sundays
- WARFA: 3.908 +/- Sun/Tue/Thu nights at 2200 CST, <http://warfa.org/>
- Youth Net: 14.320-14330 Sundays 1800-1900 UTC, Net Control: AC8PI
- YACHT: Saturdays 1900 CST on EchoLink #481872, <http://yachthams.webstarts.com>
- Northwestern Ontario ARES Net: Evenings at 20:15 (Central) on +/- 3.750Mhz
- The Iron Range Net: Saturdays at 0800 Central time on or near 3.919 Mhz. Look them up on Facebook!
- FORX Net: Mondays at 1900 Central at 3.941 Mhz +/- QRM. WAØJXT — Grand Forks, North Dakota
- HF CW: Fridays 08:00 CST, 7.112 MHz. Informal slow speed CW Net. W8IRT NCS. Email: w8irt@aol.com
- Minnesota ARES Digital Net: Thursdays at 2000 CST, 3.5835 MHz USB +/- QRM, Mode: Olivia 8/500.
- SARA Digital Net: Sundays at 1900 Local, 3.582.150 MHz USB +/- QRM, Mode: BPSK31/BPSK63
- Spider Web Net (Marco Island FL): 14.347 every morning at 0730 CST/CDT: <http://www.spiderwebnet.net>
- Broadcaster Net: 7.231 or 3.855 M/W/F @ 1500 UTC. 14.255 M-F @ 2130 UTC. <http://www.cbsretirees.com/ham.htm>
- Old Military Radio Net: 7.268 +/- nightly at 0200z. Other times/Frequencies too. See: <http://www.mrca.ar88.net/>
- Rag Chew Crew/Tailgaters/Freewheelers Nets: 3.916 +/- nightly at 1900 CST, <http://www.tailgatersnet.com>
- North South Net: 7.214.6 +/- at 0700 CST, Monday-Saturday



Next ARAC Board Meeting

Tuesday, December 6, 2022
@ 6:30 p.m.
Sammy's Pizza



ARAC CHRISTMAS PARTY 6:00 p.m.

Thursday, December 8th
at the Coppertop Church!

POTLUCK
Please bring your
favorite dish to share!
*The Club will provide meat
& cheese trays*



DOING
THE MOST
GOOD



Don't forget to bring **non-perishable food items**
for the **Salvation Army Food Shelf** to share with
families in need this holiday season!



DULUTH AREA REPEATERS

ARAC System WØGKP

| Frequency | Offset | Tone | Location |
|-----------|--------|-------|------------------------|
| 146.940 | minus | 103.5 | Duluth |
| 146.940 | minus | 107.2 | Lakeside (recv) |
| 146.940 | minus | 151.4 | Two Harbors (recv) |
| 146.940 | minus | 100.0 | Gary-New Duluth (recv) |
| 146.940 | minus | 110.9 | Cloquet (recv) |
| 147.000 | minus | 103.5 | Mahtowa |
| 444.100 | plus | 103.5 | Duluth UHF Link |

N9MMU/N9QWH System (WI)

| | | | |
|---------|-------|-------|---------------|
| 145.310 | minus | 110.9 | Duluth |
| 145.490 | minus | 110.9 | Solon Springs |
| 147.255 | plus | 110.9 | Hayward |
| 145.110 | minus | 110.9 | Rice Lake |
| 147.345 | minus | 136.5 | Holcombe |
| 145.230 | minus | 110.9 | Eau Claire |

WECOMM – WI Statewide Linked System WE9COM

| | | | |
|---------|------|-------|---|
| 147.075 | plus | 110.9 | Meteor Hill (closest repeater to Duluth) |
|---------|------|-------|---|

LSAC System #1

| | | | |
|---------|---------|-------|---------------------------|
| 147.330 | plus | 151.4 | Proctor |
| 147.330 | plus | 103.5 | Duluth (recv for Proctor) |
| 147.270 | plus | 114.8 | Two Harbors |
| 147.270 | plus | 103.5 | Wales |
| 147.090 | plus | 114.8 | Silver Bay |
| 145.410 | minus | 114.8 | Finland |
| 147.300 | plus | 114.8 | Isabella |
| 145.150 | minus | 103.5 | Washburn, WI |
| 146.700 | minus | 103.5 | Bayfield, WI |
| 443.850 | 5.00 | none | Bayfield, WI |
| 147.165 | plus | 110.9 | Hurley, WI |
| 146.640 | minus | 151.4 | Ely |
| 443.500 | 5.00 | 141.3 | Gilbert |
| 147.060 | plus | 103.5 | Virginia |
| 147.360 | plus | 162.2 | Cook |
| 147.165 | plus | 114.8 | Coleraine |
| 443.925 | 5.00 | 110.9 | Brainerd |
| 443.200 | 5.00 | 114.8 | Tamarack |
| 147.360 | plus | 203.5 | Aitkin |
| 146.865 | minus | 146.2 | Giese |
| 147.570 | simplex | 146.2 | Hinckley |
| 444.575 | 5.00 | 146.2 | Hinckley |
| 443.325 | 5.00 | 146.2 | Isanti |

NARC System NAØRC

| | | | |
|---------|-------|-------|--------------------------------|
| 147.135 | minus | 1Ø3.5 | Knife River |
| 145.45Ø | minus | 114.8 | Park Point (rcv) |
| 147.135 | plus | 114.8 | Knife River - Park Point (rcv) |

Stand Alone Repeaters

| | | | |
|---------|-------|-------|------------------|
| 145.21Ø | minus | 11Ø.9 | Clam Lake, WI |
| 146.88Ø | minus | 123.Ø | Grand Rapids. MN |
| 146.91Ø | minus | 146.2 | Duxbury, MN |

Fusion

Fusion (Analog has tone and C4FM digital with no tone)

| | | | |
|---------|-------|-------|--|
| 147.15Ø | plus | 151.4 | NTØB Gilbert, MN Fusion Repeater |
| 145.17Ø | minus | 11Ø.9 | WA9KLM Superior – Douglas County RACES/ARES Fusion Repeater (Digital only) Fusion Room 28373 |

443.1ØØ 5.ØØ1Ø3.5 KBØYHX Cloquet - Carlton County RACES/ARES Fusion Repeater

Fusion continued

444.3ØØ 5.ØØ 1Ø3.5 NØEO Spirit Valley Amateurs Fusion Repeater WIRES-X NØEO (Analog only) Fusion Room 40494

444.3ØØ 5.ØØ 1Ø3.5 NØEO Spirit Valley Amateurs Fusion Repeater WIRES-X NØEO (Analog only) Fusion Room 40494

444.400 5.00 103.5 NAØRC Knife River, MN – Wires X Connected to NØEO Room 40494

444.500 5.00 103.5 NØLCR Two Harbors, MN – Wires X Connected to NØEO Room 40494

444.600 5.00 103.5 NØLCR Silver Bay, MN – Wires X Connected to NØEO Room 40494

D Star

147.375 plus NØEO D Star
442.200 plus NØEO D Star

Revised by KCØWDQ on 4/29/2022 for The ARAC Relay

ST. Louis County Department of Emergency Services Net Control Roster

| | | | |
|-------|----------------|--------|-----------------|
| N9DMG | Scott Swanson | NØVRM | Gene Ellefsen |
| AAØAW | Doug Nelson | KCØWDQ | Paul Dallavia |
| WØNWO | Dave Miller | WØDIO | Dennis Anderson |
| KØDSL | Diane Saunders | AAØME | Randy Johnson |

Sunday Nights at 21ØØ on the ARAC System
(See Calendar for net control schedule)

Ten Meter SSB Net Control Roster

| | | | |
|-------|-----------------|-------|----------------|
| AAØAW | Doug Nelson | WØLWU | Joe Meese |
| NUØW | Gary Hanson | K9KDK | Al Babcock |
| WØDIO | Dennis Anderson | NØVRM | Gene Ellefsen |
| AAØME | Randy Johnson | KØDSL | Diane Saunders |

Sunday Nights at 2ØØØ on 28.45Ø MHz USB

Ten Meter CW Net Control Roster

| | | | |
|-------|-------------|-------|-------------|
| AAØAW | Doug Nelson | NØPDG | Mike Lovold |
|-------|-------------|-------|-------------|

Sunday Nights at 193Ø on 28.125 MHz

Northland Weather Group Net Control Roster

KCØMKS Jeff Nast

Monday Nights at 2ØØØ on the ARAC System

Douglas County Net

Tuesday Nights at 2ØØØ on 145.49Ø (N9QWH System)

Central Carlton County Net

Tuesday Nights at 2Ø3Ø on the ARAC System

Lake County RACES/ARES Net

2nd & 4th Wednesday Nights at 19ØØ on the LSAC 1 System

Elmers

El-mer / el-mær / [el-mer]

1. a male given name: from Old English words meaning "noble" and "famous."
2. an adhesive used to bond like or unlike materials
3. An experienced ham radio operator who mentors new and prospective hams.

| Name | Call Sign | Expertise |
|--------------|-----------|--|
| Jeff Nast | KCØMKS | APRS, EchoLink, WinLink, Fusion, Contesting |
| Bob Schulz | KCØNFB | Contesting |
| Jim Anderson | NØJWA | QsoNet |
| Doug Nelson | AAØAW | HF, VHF/UHF, Contesting, Packet, APRS, Morse Code, VE testing, Echolink, Allstar, EmCom... |

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Contact Kim or Steve Waller to include your name in this listing!

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Members, please check your name and email address for accuracy. If you are not on this list and want to be on the list, contact us with your info. If you need to make a change, please let us know at KEØNQS.mn@gmail.com Or KEØNQT@gmail.com



SUNDAY NIGHT NETS
 1930 - CW - 28.125 MHz USB-CW
 2000 - USB 28.450 MHz
 2100 - Southern St. Louis County
 Emergency Services Net
MONDAY NIGHT NETS
 2000 - Northland WX Net - ARAC Repeater

DECEMBER

CLUB EVENTS

TUESDAY NIGHT NETS
 2000 - Douglas Cty 145.490 MHz
 2030 - Central Carlton County
WEDNESDAY NIGHT NETS
 1900 - Lake County - LSAC1
 2nd & 4th Wednesdays
 2100 - BWAR

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|--|--|---|--|-----|---|
| | | | | 1 | 2 | 3 |
| 4 CW 1930 NØPDG USB 2000 NØVRM ES 2100 AAØAW | 5 31 WX 2000 KCØMKS | 6 ARAC BOARD MEETING Sammy's Pizza 6:30 pm DC Net 2000 CC Net 2030 | 7 2100 - BWAR |  8 ARAC Club Meeting & Christmas Party! Coppertop Church 6:00 PM | 9 | 10 |
| 11 CW 1930 AAØAW USB 2000 NØPDG ES 2100 KD9VKI | 12 DC ARES/RACES Mtg 1900 DC EOC WX 2000 KCØMKS | 13 DC Net 2000 CC Net 2030 | 14 Lake County ARES/RACES Meeting 1800 Lake County Net 1900 2100 - BWAR | 15 | 16 | 17 |
| 18 CW 1930 NØPDG USB 2000 AAØAW ES 2100 KCØWDQ | 19 WX 2000 KCØMKS | 20 DC Net 2000 CC Net 2030 | 21 St Louis County ARES/RACES Meeting 1800 2100 - BWAR | 22 Carlton County ARES/RACES Meeting ??? 1900 CC EOC | 23 | 24 |
| 25 MERRY CHRISTMAS! CW 1930 AAØAW USB 2000 WØLWU ES 2100 WØNWØ | 26 WX 2000 KCØMKS | 27 DC Net 2000 CC Net 2030 | 28 Lake County Net 1900 2100 - BWAR | 29 | 30 | 31 ARAC Club Breakfast The Chalet 4833 Miller Trunk Hwy Hermantown, MN 8 AM |
| | | | | | | |

Get this newsletter *faster*
via email!
Email Doug AAØAW at
aa0aw@arrl.net

Next Meeting: Thursday,
December 8th, 2022 - 6 pm
at the Coppertop Church!

ARAC Committee Chairs



Club License Trustee:

Ray Barnes KEØZN

Control Operators:

AAØAW - NØKXT - KCØNFB

Newsletter/Historian:

Kim KEØNQS & Steve KEØNQT
Waller

Education Chair:

Bob Schulz KCØNFB

Hamfest Chair:

Bob Schulz KCØNFB

Chaplain:

Rollie Bockbader KBØCK

Visiting Chaplain:

Parliamentarian:

Grant Forsyth KCØWUP

Website:

Thomas Dorr KEØRHA

Membership:

Bruce Carlson KEØNIT

Property Chair:

Scott Ahlgren NØVYU

Testing:

Doug Nelson AAØAW

Field Day:

Picnic Chair:

Scott Ahlgren, NØVYU

Repeater Chairs:

Randy Haglin NØBZZ
Randy Wabik KAØJZV

Contest Calendar at www.contestcalendar.com

National Contest Journal at www.ncjweb.com

QSO Party Note: State/Province/National QSO Parties are abbreviated with the 2 or 3 letter abbreviation for the state/province/national designation followed by QP for QSO Party:

Examples: Minnesota QSO Party is MNQP
British Columbia QSO Party = BCQP

QRZ web site at www.qrz.com

VHF Propagation site at www.aprs.mountainlake.k12.mn.us

Reminder: The Contest Corral monthly listing of contests can be found in each issue of QST. ARRL sponsored contests can be found in Contest Corral, highlighted, or on the ARRL's web site at arrl.org.



HOLIDAY GIFT IDEAS & BUYING GUIDE

RADIOS & Equipment



ICOM IC-2730A 50W 144/430MHz Dual Band FM Mobile Transceiver. Optional Bluetooth Headset **\$309.95** at HamRadio.com

ICOM IC-9700 VHF/UHF/SHF D-STAR Transceiver
All mode, Tri-band transceiver covers 144,430/440 & 220 MHz Supports CW/AM/SSB/FM/RTTY & D-STAR DV& DD modes **\$1749.95** at HamRadio.com



SDRPLAY DUO
RSPduo Dual Tuner 14-bit SDR Radio Spectrum Processor/ includes SDR-UNO Software

Dual-tuner wideband full featured 14-bit SDR which covers the entire RF spectrum from 1 kHz to 2 GHz giving 10 MHz of spectrum visibility. Combined with the power of SDRUno software for Windows, simultaneously monitor two completely separate 2 MHz bands of spectrum anywhere between 1 kHz and 2 GHz. Three software selectable antenna inputs, and clocking features ideally suited to industrial, scientific and educational applications.

\$289.95 at HamRadio.com



YAESU FT-70DR
Compact Fusion Transceiver
2M/70 cm
Analog +
C4FM Digital

Up to 5W of reliable RF power & 700mW loud audio output

\$174.95 at HamRadio.com



Buddipole BuddiHEX
Portable Hexagonal Beam Antenna

Buddihex™ Ultra Lightweight 6 band (20m – 6m) Portable Hex Beam. A complete and easily transportable antenna system that sets up in 20 minutes. Get ready to light up the airwaves!

\$599 at BuddiPole.com



K1EL K45 CW Modem

Backorder until Feb. due to great review in QST Magazine, but worth the wait!

K45 is the Swiss Army knife of CW keys. A CW keyboard interface, CW reader, iambic paddle keyer, backlit LCD display, and optically isolated keying outputs all in one compact box. The K45 will operate many different modes including RTTY transmit, QRSS, HSCW, and conventional CW up to 99 WPM. K45 is assembled, tested, and ready to go. Powered over USB cable connection to PC, charger, or battery. Email k1el.kitsinfo@gmail.com to reserve.
K45 Modem: **\$239**, Cable Kit: **\$8**



All-New Duplex MMDVM Hotspot Assembled Radio Station

WiFi Digital Voice Modem for DMR, D-STAR, P25.

YSF Raspberry Pi Zero W. UHF in duplex mode

UHF & VHF in simplex mode.

Hotspot will also work mobile in your vehicle if tethered it to your mobile phone network.

\$258.73 at Amazon.com

Continued on Page 15



HOLIDAY GIFT IDEAS & BUYING GUIDE *continued*

SIGNS & PLAQUES



Aluminum Sign, 8.5" X 11"
\$26.99 from Amazon.com



Parking Only Sign, 11"X17"
\$18.99 at Amazon.com



CUSTOM Call Sign Circle Sign, 9 colors,
18" Black Shown, \$89.95. Other Sizes: 8"- \$32.95,
12" - \$54.95, 14" - \$68.95, 24" - \$129.95, 28" - \$178.95,
30" - \$199.95, 32" - \$219.95, 36" - \$349.95
Order at Pamotee.com

HAM RADIO CRIB NOTES

| | | | |
|--|--|--|--|
| RTTY & Data Phone & Image E Amateur Extra | MC CW Only SSB Phone A Advanced | USB Phone, CW, RTTY & Data Fixed Digital Message Forwarding G General | T Technician N Novice |
|--|--|--|--|

| HF BANDS | VHF & UHF BANDS |
|---|--|
| 160 Meters (1.8 MHz) 1800 - 2000 MHz | 50.1 - 6 Meters (50 MHz) 50 - 54 MHz |
| 3.500 - 3.600 - 3.700 - 4.000 MHz 3.525 - 3.600 - 3.800 | 1240 - 23 cm (1240 MHz) 1270 - 1295 |
| 60 Meters (5.3 MHz) 5330.5 - 5346.5 - 5357.0 - 5371.5 - 5403.5 kHz | 1.25 Meters (222 MHz) 219.0 - 220.0 - 222.0 - 225.0 MHz |
| 40 Meters (7 MHz) 7.000 - 7.300 MHz 7.025 - 7.125 - 7.175 | 70 cm (420 MHz) 420.0 - 450.0 MHz |
| 30 Meters (10.1 MHz) 10.100 - 10.150 MHz | 33 cm (920 MHz) 902.0 - 928.0 MHz |
| 20 Meters (14 MHz) 14.000 - 14.350 MHz 14.025 - 14.150 - 14.225 | 2 Meters (144 MHz) 144.0 - 148.0 MHz |

| Q CODES | |
|---------|--|
| QRL | Is the frequency busy? The frequency is busy. Please do not interfere. |
| QRN | Abbreviation for interference from other signals. |
| QRX | Abbreviation for interference from natural or man-made radio. |
| QRV | Shall I increase power? Increase power. |
| QRZ | Shall I decrease power? Decrease power. |
| QRQ | Shall I send faster? Send faster (WPM). |
| QRS | Shall I send more slowly? Send more slowly (WPM). |
| QRT | Shall I stop sending? Stop sending. |
| QRU | Have you anything more for me? I have nothing more for you. |
| QRV | Are you ready? I am ready. |
| QRX | standby. |
| QRZ | Who is calling me? |
| QSL | Abbreviation for signal fading. |
| QSO | Received and understood. |
| QST | Abbreviation for a contact. |
| QTH | General call preceding a message addressed to all amateurs. |
| QTX | I'm listening on _____ kHz. |
| QTY | Change to transmission on another frequency (or to _____ MHz). |
| QTH | What is your location? My location is _____. |

| PHONETIC ALPHABET | |
|---|---|
| CIVILIAN A: ADAM, B: BOB, C: CHARLES, D: DAVID, E: EDWARD, F: FRANK, G: GEORGE, H: HENRY, I: IAN, J: JOHN, K: KING, L: LINCOLN, M: MARY | MILITARY A: ALPHA, B: BRAVO, C: CHARLIE, D: DELTA, E: ECHO, F: FOXTROT, G: GOLF, H: HOTEL, I: INDIA, J: JULIETT, K: KAY, L: LIMA, M: MIKE |

| MORSE CODE |
|---|
| AMERICAN (MORSE) A: •••—, B: —•••, C: —•—•, D: —•—•, E: ••••, F: ••—•, G: —•—•, H: —•••, I: ••—•, J: —•—•, K: —•—•, L: —•••, M: —•—•, N: —•—•, O: —•—•, P: —•—•, Q: —•—•, R: —•—•, S: —•—•, T: —•—•, U: —•—•, V: —•—•, W: —•—•, X: —•—•, Y: —•—•, Z: —•—• |

| INTERNATIONAL (ITU) |
|--|
| A: •••—, B: —•••, C: —•—•, D: —•—•, E: ••••, F: ••—•, G: —•—•, H: —•••, I: ••—•, J: —•—•, K: —•—•, L: —•••, M: —•—•, N: —•—•, O: —•—•, P: —•—•, Q: —•—•, R: —•—•, S: —•—•, T: —•—•, U: —•—•, V: —•—•, W: —•—•, X: —•—•, Y: —•—•, Z: —•—• |

| PUNCTUATION |
|--|
| /: Break in transmission (): End of transmission . : End of message : : Call sign ! : Attention ? : Question # : End of transmission @ : Attention & : Attention * : Attention + : Attention - : Attention = : Attention > : Attention < : Attention & : Attention * : Attention + : Attention - : Attention = : Attention > : Attention < : Attention |

Ham Radio Crib Notes Vintage-Look METAL Sign

NOT a poster, this 16"x12" metal sign features data on HF Bands, VHF & UHF Bands, Q Codes, Phonetic Alphabet, Morse Code, and International Code. A Great addition to every ham shack!

\$18.99 at Amazon.com



MFJ 115 Deluxe World Map 24 Hour Quartz Wall Clock

Set this clock to GMT and you'll know what time it is in designated areas of the world at any time of the day. Premiere cities outline the trim of this 12" clock. Each city has a + or - number from GMT. Simply add or subtract to know the time in each city.

\$57.54 at Amazon.com

Continued on Page 16



HOLIDAY GIFT IDEAS & BUYING GUIDE *continued*

APPAREL



HAM RADIO LENGEND Vintage-look Hats
Embroidered Cotton Twill, One Size, 3 Colors

\$29.99 each at [Amazon.com](#)



Men's Tee, Sizes S-3XL
Women's Tee, XS-3XL
8 colors: black, navy, kelly green, dark heather, heather grey, heather blue, purple, royal blue

All Sizes \$19 at [Amazon.com](#)



Ham Radio Christmas Sweatshirt

5 Colors, S-2XL

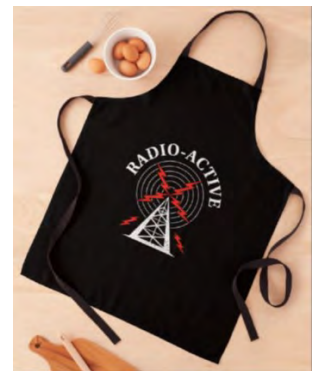
\$33.95 at [Amazon.com](#)



CW 73 Bucket Hat
\$17.57 at [RedBubble.com](#)



Legendary HEIL Ham Radio Tee - \$20-\$24; sizes S to 3XL [HeilHamRadio.com](#)



"Radio Active" Apron
One Size
\$18.33 at [RedBubble.com](#)



Stars & Stripes Knit Scarf
\$20.00 at [Amazon.com](#)

SWR Meter Tee: Men S-3X, Women XS-3X

9 Colors: black, navy, kelly green, olive green, dark heather, heather grey, heather blue, purple, royal blue

All Sizes \$19 at [Amazon.com](#)



Ham Radio The Original Social Network Classic Hoodie
15 colors, Unisex Sizes S-5XL. Price varies with size.

\$25.99 - \$36.99 at [printerval.com](#)

Continued on Page 17



HOLIDAY GIFT IDEAS & BUYING GUIDE *continued*

Accessories



"I'm Radio" Active" Pop Socket grip for phones & tablets, **\$12.99** at Amazon.com

LM-WEDGE

Plastic device holder wedges between seat and console.

Adjustable viewing angle, provides multiple options for installing two devices:

Mobile Radio Remote Head, HT, Microphone.

Cell phone attaches with the optional LM-H holder. Any combination you prefer. Customize mounting with your equipment manufacturer's head bracket.

\$45 at LidoRadio.com



Twists vertically or horizontally



Drinkware



"I'm an Awesome Ham Radio Dad" or "I'm an Awesome Ham Radio Mom"
Insulated Stemless Wine Glass
\$29.95 each at Amazon.com

"I Think therefore I HAM"

16 oz pub beer glass
\$29.95 from Amazon.com



Personalized "Amateur Radio Knowledge/ I'm Radio-Active" 20 Oz. Insulated Cup with Lid
\$24.99 at Amazon.com



"May The Morse Be With You" 11 oz Mug
\$8.95 at Amazon.com



"Ham Radio Operator" Mug
American Flag on Black
\$16 at printerval.com



"Ham Radio the Original Social Network"
11 oz Mug - **\$10.95** 15 oz Mug - **\$14.95**
at printerval.com

Continued on Page 18



MORE FUN GIFT IDEAS ...



OontZ Upgraded Angle 3 Bluetooth Speaker

HIGHER QUALITY CRYSTAL CLEAR STEREO SOUND: Designed and Engineered by Cambridge Sound Works in the USA, with the highest quality components.

LOUDER VOLUME WITH ZERO DISTORTION: Surprisingly loud with no distortion, even at maximum volume. **POWERFUL 10 WATTS OF OUTPUT VOLTAGE**

INDOOR AND OUTDOOR USE: Incredible **BLUETOOTH (5.0) RANGE OF 100 FEET** meaning **CONSTANT UNINTERRUPTED MUSIC**

IPX5 WATER RESISTANT – Splashproof making it the

IDEAL SHOWER SPEAKER or for TRIPS TO THE BEACH , POOL or DOCK
2 CHANNEL PAIRING MODE: Buy 2 & Pair as Right & Left Channel Speakers!

Choice of 6 colors. **\$29.99** at Amazon.com

Smartphone Photo Printer

Works with all iPhones, iPads and Galaxy/Android devices to make borderless 4"x 6" color prints in seconds.

Works from your mobile device with no computer & plugs into AC outlet

Simply download the free app to crop, edit, apply filters and make collages and ID photos

Ideal for parties, school projects, scrapbooking and more

Compatible with iPhone/iPad (iOS 6.0 or later) & Galaxy/Android (OS 4.0.3 or later)

Includes 1 ink cartridge and 10 photo papers

\$135.99
with Code **GIFT20**
at
SharperImage.com



ADASION 12x56 HD Monocular Telescope with Smartphone Adapter

-Upgraded Tripod, & Hand Strap

-High Power Monocular with Clear Low-Light Vision

-Lightweight Monocular convenient for Bird Watching, Nature Photos, Camping & Hunting

-IPX7 Nitrogen-filled: provides waterproof, fog proof, dustproof and shockproof protection in any weather and any conditions.

\$116.95 at Amazon.com



8-In-1 Emergency Auto Tool. Fits in your pocket, yet has eight essential gadgets: digital tire gauge nozzle, LED flashlight, flashing red emergency LED, Phillips head screwdriver, flat head screwdriver, bottle opener, knife and automatic glass breaker.

\$31.99 with Code **GIFT20** at SharperImage.com



Contest Calendar - December 2022

[+ QRP ARCI Topband Sprint](#)

[+ Walk for the Bacon QRP Contest](#)

[+ CWops Test](#)

[+ CWops Test](#)

[+ RTTYOPS Weeksprint](#)

[+ NRAU 10m Activity Contest](#)

[+ SKCC Sprint Europe](#)

[+ NCCC RTTY Sprint](#)

[+ QRP Fox Hunt](#)

[+ NCCC Sprint](#)

[+ K1USN Slow Speed Test](#)

[+ ARRL 160-Meter Contest](#)

[+ Kalbar Contest](#)

[+ UFT Meeting](#)

[+ Wake-Up! QRP Sprint](#)

[+ PRO CW Contest](#)

[+ INORC Contest](#)

[+ FT Roundup](#)

[+ K1USN Slow Speed Test](#)

0000Z-0300Z, Dec 1

0000Z-0100Z, Dec 1 and

0200Z-0300Z, Dec 2

0300Z-0400Z, Dec 1

0700Z-0800Z, Dec 1

1700Z-1900Z, Dec 1

1800Z-1900Z, Dec 1 (CW) and

1900Z-2000Z, Dec 1 (SSB) and

2000Z-2100Z, Dec 1 (FM) and

2100Z-2200Z, Dec 1 (Dig)

2000Z-2200Z, Dec 1

0145Z-0215Z, Dec 2

0200Z-0330Z, Dec 2

0230Z-0300Z, Dec 2

2000Z-2100Z, Dec 2

2200Z, Dec 2 to 1600Z, Dec 4

0000Z, Dec 3 to 2359Z, Dec 4

0500Z-0800Z, Dec 3 and

1500Z-1800Z, Dec 3 and

0700Z-1000Z, Dec 4

0600Z-0629Z, Dec 3 and

0630Z-0659Z, Dec 3 and

0700Z-0729Z, Dec 3 and

0730Z-0800Z, Dec 3

1200Z, Dec 3 to 1159Z, Dec 4

1400Z, Dec 3 to 1359Z, Dec 4

1800Z, Dec 3 to 2359Z, Dec 4

0000Z-0100Z, Dec 5

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Contest Calendar - December 2022, Continued

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|---|--------------------------------|
| <u>+ ICWC Medium Speed Test</u> | 1300Z-1400Z, Dec 5 |
| <u>+ OK1WC Memorial</u> | 1630Z-1729Z, Dec 5 |
| <u>+ ICWC Medium Speed Test</u> | 1900Z-2000Z, Dec 5 |
| <u>+ Worldwide Sideband Activity Contest</u> | 0100Z-0159Z, Dec 6 |
| <u>+ ARS Spartan Sprint</u> | 0200Z-0400Z, Dec 6 |
| <u>+ ICWC Medium Speed Test</u> | 0300Z-0400Z, Dec 6 |
| <u>+ RTTYOPS Weeksprint</u> | 1700Z-1900Z, Dec 6 |
| <u>+ QRP Fox Hunt</u> | 0200Z-0330Z, Dec 7 |
| <u>+ Phone Weekly Test</u> | 0230Z-0300Z, Dec 7 |
| <u>+ A1Club AWT</u> | 1200Z-1300Z, Dec 7 |
| <u>+ CWops Test</u> | 1300Z-1400Z, Dec 7 |
| <u>+ Mini-Test 40</u> | 1700Z-1759Z, Dec 7 |
| <u>+ VHF-UHF FT8 Activity Contest</u> | 1700Z-2100Z, Dec 7 |
| <u>+ Mini-Test 80</u> | 1800Z-1859Z, Dec 7 |
| <u>+ CWops Test</u> | 1900Z-2000Z, Dec 7 |
| <u>+ CWops Test</u> | 0300Z-0400Z, Dec 8 |
| <u>+ CWops Test</u> | 0700Z-0800Z, Dec 8 |
| <u>+ RTTYOPS Weeksprint</u> | 1700Z-1900Z, Dec 8 |
| <u>+ EACW Meeting</u> | 1900Z-2000Z, Dec 8 |
| <u>+ NCCC RTTY Sprint</u> | 0145Z-0215Z, Dec 9 |
| <u>+ QRP Fox Hunt</u> | 0200Z-0330Z, Dec 9 |
| <u>+ NCCC Sprint</u> | 0230Z-0300Z, Dec 9 |
| <u>+ K1USN Slow Speed Test</u> | 2000Z-2100Z, Dec 9 |
| <u>+ ARRL 10-Meter Contest</u> | 0000Z, Dec 10 to 2400Z, Dec 11 |
| <u>+ PODXS 070 Club Triple Play Low Band Sprint</u> | 0000Z, Dec 10 to 2359Z, Dec 12 |
| <u>+ TRC Digi Contest</u> | Cancelled for 2022 |
| <u>+ SKCC Weekend Sprintathon</u> | 1200Z, Dec 10 to 2400Z, Dec 11 |
| <u>+ ARI 40/80 Contest</u> | 1300Z, Dec 10 to 1300Z, Dec 11 |

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Contest Calendar - December 2022, Continued

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| <u>+ International Naval Contest</u> | 1600Z, Dec 10 to 1559Z, Dec 11 |
| <u>+ QRP ARCI Holiday Spirits Sprint</u> | 2000Z-2300Z, Dec 11 |
| <u>+ CQC Great Colorado Snowshoe Run</u> | 2100Z-2259Z, Dec 11 |
| <u>+ K1USN Slow Speed Test</u> | 0000Z-0100Z, Dec 12 |
| <u>+ 4 States QRP Group Second Sunday Sprint</u> | 0100Z-0300Z, Dec 12 |
| <u>+ ICWC Medium Speed Test</u> | 1300Z-1400Z, Dec 12 |
| <u>+ OK1WC Memorial</u> | 1630Z-1729Z, Dec 12 |
| <u>+ ICWC Medium Speed Test</u> | 1900Z-2000Z, Dec 12 |
| <u>+ Worldwide Sideband Activity Contest</u> | 0100Z-0159Z, Dec 13 |
| <u>+ ICWC Medium Speed Test</u> | 0300Z-0400Z, Dec 13 |
| <u>+ RTTYOPS Weeksprint</u> | 1700Z-1900Z, Dec 13 |
| <u>+ NAQCC CW Sprint</u> | 0130Z-0330Z, Dec 14 |
| <u>+ QRP Fox Hunt</u> | 0200Z-0330Z, Dec 14 |
| <u>+ Phone Weekly Test</u> | 0230Z-0300Z, Dec 14 |
| <u>+ A1Club AWT</u> | 1200Z-1300Z, Dec 14 |
| <u>+ CWops Test</u> | 1300Z-1400Z, Dec 14 |
| <u>+ Mini-Test 40</u> | 1700Z-1759Z, Dec 14 |
| <u>+ VHF-UHF FT8 Activity Contest</u> | 1700Z-2100Z, Dec 14 |
| <u>+ Mini-Test 80</u> | 1800Z-1859Z, Dec 14 |
| <u>+ CWops Test</u> | 1900Z-2000Z, Dec 14 |
| <u>+ Walk for the Bacon QRP Contest</u> | 0000Z-0100Z, Dec 15 and 0200Z-0300Z, Dec 16 |
| <u>+ CWops Test</u> | 0300Z-0400Z, Dec 15 |
| <u>+ CWops Test</u> | 0700Z-0800Z, Dec 15 |
| <u>+ RTTYOPS Weeksprint</u> | 1700Z-1900Z, Dec 15 |
| <u>+ NTC QSO Party</u> | 1900Z-2000Z, Dec 15 |
| <u>+ NCCC RTTY Sprint</u> | 0145Z-0215Z, Dec 16 |
| <u>+ QRP Fox Hunt</u> | 0200Z-0330Z, Dec 16 |

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Contest Calendar - December 2022, Continued

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| <u>+ NCCC Sprint</u> | 0230Z-0300Z, Dec 16 |
| <u>+ AGB-Party Contest</u> | 1600Z-1700Z, Dec 16 |
| <u>+ Russian 160-Meter Contest</u> | 1800Z-2200Z, Dec 16 |
| <u>+ K1USN Slow Speed Test</u> | 2000Z-2100Z, Dec 16 |
| <u>+ OK DX RTTY Contest</u> | 0000Z-2400Z, Dec 17 |
| <u>+ RAC Winter Contest</u> | 0000Z-2359Z, Dec 17 |
| <u>+ Feld Hell Sprint</u> | 0000Z-2359Z, Dec 17 |
| <u>+ Croatian CW Contest</u> | 1400Z, Dec 17 to 1400Z, Dec 18 |
| <u>+ Stew Perry Topband Challenge</u> | 1500Z, Dec 17 to 1500Z, Dec 18 |
| <u>+ ARRL Rookie Roundup, CW</u> | 1800Z-2359Z, Dec 18 |
| <u>+ Run for the Bacon QRP Contest</u> | 2300Z, Dec 18 to 0100Z, Dec 19 |
| <u>+ K1USN Slow Speed Test</u> | 0000Z-0100Z, Dec 19 |
| <u>+ ICWC Medium Speed Test</u> | 1300Z-1400Z, Dec 19 |
| <u>+ OK1WC Memorial</u> | 1630Z-1729Z, Dec 19 |
| <u>+ ICWC Medium Speed Test</u> | 1900Z-2000Z, Dec 19 |
| <u>+ Worldwide Sideband Activity Contest</u> | 0100Z-0159Z, Dec 20 |
| <u>+ ICWC Medium Speed Test</u> | 0300Z-0400Z, Dec 20 |
| <u>+ RTTYOPS Weeksprint</u> | 1700Z-1900Z, Dec 20 |
| <u>+ NAQCC CW Sprint</u> | 0130Z-0330Z, Dec 21 |
| <u>+ QRP Fox Hunt</u> | 0200Z-0330Z, Dec 21 |
| <u>+ Phone Weekly Test</u> | 0230Z-0300Z, Dec 21 |
| <u>+ A1Club AWT</u> | 1200Z-1300Z, Dec 21 |
| <u>+ CWops Test</u> | 1300Z-1400Z, Dec 21 |
| <u>+ Mini-Test 40</u> | 1700Z-1759Z, Dec 21 |
| <u>+ VHF-UHF FT8 Activity Contest</u> | 1700Z-2100Z, Dec 21 |
| <u>+ Mini-Test 80</u> | 1800Z-1859Z, Dec 21 |
| <u>+ CWops Test</u> | 1900Z-2000Z, Dec 21 |
| <u>+ CWops Test</u> | 0300Z-0400Z, Dec 22 |
| <u>+ CWops Test</u> | 0700Z-0800Z, Dec 22 |

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Contest Calendar - December 2022, Continued

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| <u>+ RTTYOPS Weeksprint</u> | 1700Z-1900Z, Dec 22 |
| <u>+ NCCC RTTY Sprint</u> | 0145Z-0215Z, Dec 23 |
| <u>+ QRP Fox Hunt</u> | 0200Z-0330Z, Dec 23 |
| <u>+ NCCC Sprint</u> | 0230Z-0300Z, Dec 23 |
| <u>+ K1USN Slow Speed Test</u> | 2000Z-2100Z, Dec 23 |
| <u>+ CW QRS Xmas Activity</u> | 0000Z, Dec 24 to 2359Z, Dec 31 |
| <u>+ RAEM Contest</u> | 0000Z-1159Z, Dec 25 |
| <u>+ K1USN Slow Speed Test</u> | 0000Z-0100Z, Dec 26 |
| <u>+ DARC Christmas Contest</u> | 0830Z-1059Z, Dec 26 |
| <u>+ QCX Challenge</u> | 1300Z-1400Z, Dec 26 |
| <u>+ ICWC Medium Speed Test</u> | 1300Z-1400Z, Dec 26 |
| <u>+ OK1WC Memorial</u> | 1630Z-1729Z, Dec 26 |
| <u>+ ICWC Medium Speed Test</u> | 1900Z-2000Z, Dec 26 |
| <u>+ QCX Challenge</u> | 1900Z-2000Z, Dec 26 |
| <u>+ Worldwide Sideband Activity Contest</u> | 0100Z-0159Z, Dec 27 |
| <u>+ ICWC Medium Speed Test</u> | 0300Z-0400Z, Dec 27 |
| <u>+ QCX Challenge</u> | 0300Z-0400Z, Dec 27 |
| <u>+ RTTYOPS Weeksprint</u> | 1700Z-1900Z, Dec 27 |
| <u>+ SKCC Sprint</u> | 0000Z-0200Z, Dec 28 |
| <u>+ QRP Fox Hunt</u> | 0200Z-0330Z, Dec 28 |
| <u>+ Phone Weekly Test</u> | 0230Z-0300Z, Dec 28 |
| <u>+ A1Club AWT</u> | 1200Z-1300Z, Dec 28 |
| <u>+ CWops Test</u> | 1300Z-1400Z, Dec 28 |
| <u>+ Mini-Test 40</u> | 1700Z-1759Z, Dec 28 |
| <u>+ Mini-Test 80</u> | 1800Z-1859Z, Dec 28 |
| <u>+ CWops Test</u> | 1900Z-2000Z, Dec 28 |

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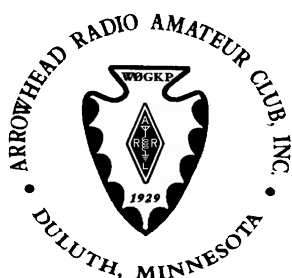
Contest Calendar - December 2022, Continued

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|--|---------------------|
| <u>+ CWops Test</u> | 0300Z-0400Z, Dec 29 |
| <u>+ CWops Test</u> | 0700Z-0800Z, Dec 29 |
| <u>+ RTTYOPS Weeksprint</u> | 1700Z-1900Z, Dec 29 |
| <u>+ NCCC RTTY Sprint</u> | 0145Z-0215Z, Dec 30 |
| <u>+ QRP Fox Hunt</u> | 0200Z-0330Z, Dec 30 |
| <u>+ NCCC Sprint</u> | 0230Z-0300Z, Dec 30 |
| <u>+ YOTA Contest</u> | 1200Z-2359Z, Dec 30 |
| <u>+ K1USN Slow Speed Test</u> | 2000Z-2100Z, Dec 30 |
| <u>+ Bogor Old and New Contest</u> | 0900Z-2359Z, Dec 31 |

Our thanks to **Bruce Horn, WA7BNM** for use of this calendar!
 Visit Bruce at www.contestcalendar.com/contestcal.html



The ARAC RELAY



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