



# The RELAY)))

January 2024

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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## NASA Calls for Ham Radio Help HamSCI Participants Needed !

For 123 years, The Audubon Society has conducted the 23-day Christmas Bird Count from December 14th of each year to January 5th. Beginning on Christmas Day 1900, the annual Count has just concluded its 124th event. Organized into geographical circles, it grew from the U.S. to include Canada, and now has an additional 20 countries participating worldwide. The public joins their local circle and is trained on how to observe either a bird route or feeding location and collect tallies on how many bird species they see as well as specific counts in each species. This event is a great outdoor activity for couples and families, with collected data helping scientists understand bird migratory patterns and population growth year-to-year.

The U.S. Fish and Wildlife Service maintains the **National Wildlife Refuge System** and cooperates with the Audubon Society for the annual Christmas Bird Count. The agency's annual Bird Count Blog recently posted this:

"Legendary biologist, founding author of the Golden Guides, and retired 60 year U.S. Fish and Wildlife Service employee Chan Robbins had this to say... 'If we had not had a Christmas Bird Count in those early years, we would not have as strong an understanding of long term bird trends. Many of these changes take place gradually.' "

Mike Carlo, a visitor services specialist for the **National Wildlife Refuge System** is an "avid birder" who is also quoted in the post. Carlo says, "The majority of refuges are within a Christmas Bird Count circle, which is wonderful because CBCs are one of the world's oldest examples of citizen scientists contributing to wildlife conservation."

**So what does any of this have to do with ham radio?** The CBC event is the oldest and longest continual running organized *citizen scientist project*, proving the essential contribution that "everyday citizens" make to science. **NASA** has come to understand this too, and in 2015 created its **Citizen Science**

Continued on Page 15



Image: NASA

Spectacular solar eclipse image from NASA's website, captioned as follows:  
**Eclipses**  
NASA studies solar eclipses from the ground, in our atmosphere, and in space, influencing solar and Earth science

The Relay Co-Editors:  
Kim & Steve Waller

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# 2024



Join us on  
facebook!

# ARAC Board of Directors

## PRESIDENT



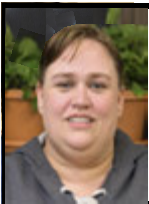
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3710 Chambersburg Ave  
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lspitech@mail.com

## VICE PRESIDENT



**KØDJP**  
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david.pyriik@gmail.com

## SECRETARY



**KFØGJW**  
Melinda Nelson  
  
jonbeeyore@outlook.com

## TREASURER



**KEØYTM**  
Sam Frey  
  
ke0ytm@gmail.com

## 3RD YEAR BOARD



**AAØAW**  
Doug Nelson  
  
aaøaw@arrl.com

## 2ND YEAR BOARD



**AAØAC**  
Dave Davis  
  
218-348-6649  
aaøac@outlook.com

## 1ST YEAR BOARD



**KD9VKI**  
Justin Cheever

PHOTO  
COMING  
SOON!

No Minutes for the December 2023  
**ARAC Board of Directors Meeting,**  
as we did not have a quorum.

Latest Treasurer's Report, as published in the December  
14th Club Meeting Minutes on page 3 of this issue:

### Treasurer's Report:

|                         |                   |
|-------------------------|-------------------|
| Checking:               | \$1,509.40        |
| Savings:                | \$2,886.08        |
| Repeater:               | \$2,069.94        |
| <b>Subtotal Cash</b>    | <b>\$6,465.42</b> |
| Winter CD:              | \$1,736.49        |
| Summer CD:              | \$0.00            |
| <b>Subtotal CD:</b>     | <b>\$1,736.49</b> |
| <b>Assets Subtotal:</b> | <b>\$8,201.91</b> |

*Our Thanks to*  
**ARAC Treasurer Sam Frey KEØYTM**





# ARAC Club Meeting Minutes

**December 14, 2023**

**Present:**

President: Gene Ellefsen – N0VRM  
Vice President: Dave Pyrlik – K0DJP  
Treasurer/Membership: Sam Frey – KE0YTM  
Secretary: Melinda Nelson – KF0GJW  
Second Year Board: Doug Nelson – AA0AW  
Third Year Board: Dave Davis – AA0AC  
Special Events: Open/Gene Ellefsen – N0VRM (acting)  
Parliamentarian: Grant Forsyth – KC0WUP  
Testing: Doug Nelson – AA0AW  
Repeater: Dave Pyrlik – K0DJP  
Property/Picnic: Scott Ahlgren – N0VYU  
HamFest/Education: Bob Schulz – KC0NFB  
Newsletter/Historian: Kim Waller – KE0NQS  
Newsletter/Historian: Steve Waller – KE0NQT

**Absent:**

First Year Board: Dennis Anderson – W0DIO  
Chaplin:  
Web Site: Thomas Dorr – KE0RHA

Meeting called to order at 18:07 (6:07 PM) by President Gene Ellefsen – N0VRM. Sixty-four (64) members were in attendance.

**Minutes:**

Minutes are posted on the website and in the newsletter. Motion to accept by Diane Saunders – K0DSL, seconded by Jeff Nast – KC0MKS. Motion Passed.

**Treasurer's Report:**

Checking: \$1,509.40  
Savings: \$2,886.08  
Repeater: \$2,069.94  
**Subtotal Cash \$6,465.42**

Winter CD: \$1,736.49  
Summer CD: \$0.00  
**Subtotal CD: \$1,736.49**

**Assets Subtotal: \$8,201.91**

Motion to accept as presented by Bob Schulz – KC0NFB, seconded by Diane Saunders – K0DSL, motion passed.

*Continued on Page 4*



# ARAC Club Meeting Minutes, cont.

## **Election:**

A white Ballot for President, Vice President, Secretary, and Treasurer made by Sam Frey – KE0YTM, seconded by Jeff Nast – KC0MKS. Motion passed.

First Year Board: Dave Davis – AA0AC, Justin Cheever – KD9VKI, Brian Beckman – KF0LFZ (Motion to close Diane Saunders – K0DSL, seconded by Sam Frey – KE0YTM)

Voted for First Year Board – Justin Cheever – KD9VKI won with the most votes.

Dave Davis – AA0AC came in second and is taking over for Dennis Anderson – W0DIO who could no longer fulfill his duties.

This year's Thomas J Reibold Award W9IBM Memorial Award went to Diane Saunders – K0DSL. Congratulations Diane.

## **Repeater:**

Dave Pyrlík – K0DJP report on Mahtowa. Was there the other day. The heater is on and there is not much overgrown. The link from Duluth to Mahtowa but having an issue with the receiver on the Duluth side. Going to take a look at that and will keep you posted.

## **New Business:**

Winter Field Day – January 27, 2024

## **Silent Key: (Please keep their family in your thoughts)**

Door Prize was won by Andrew Haugen – KF0DBH

Motion to adjourn by Bob Schulz – KC0NFB, seconded by Justin Cheever – KD9VKI, motion passed at 16:31 (6:31 PM).



**CLUB REPEATER**

**WØGKP**

146.94 (-)

CTCSS TONE

103.5



## Prez Sez...

### HAPPY NEW YEAR!!

I would like to thank those who helped out at the Christmas Party:

- ◆ Doug Nelson for presenting the **2023 Thomas Reibold W9IBM** award to **Diane Saunders**
- ◆ Kim and Steve Waller for the music and Table decorations
- ◆ Dave Pyrlik for help setting up
- ◆ Bruce Carlson for helping giving out the gifts
- ◆ and to all of you who brought the delicious food and /or gifts

Thank You!!!

**Winter Field Day** is Saturday January 27 1:00 PM to Sunday January 28 1:00 PM at Dave & Robin Davis's home, located at **1461 Carl St. Cloquet, MN.**

**All are welcome!** This is a good opportunity for you new Hams to get some HF experience operating radios and learning how to log contacts on the computer--and also get any questions you have answered. **There will be food!** We do pot luck, so if you would like to bring something to share, that would be great.

Finally, it is that time of the year for dues collection, so get them in when you can.

*Have a Happy and Safe New Year from 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](mailto: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](http://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 |



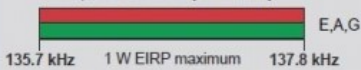
## US Amateur Radio Bands

### US AMATEUR POWER LIMITS

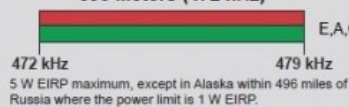
FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

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](http://www.arrl.org/graphical-frequency-allocations) when the bands are fully available for use.

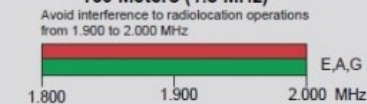
#### 2,200 Meters (135 kHz)



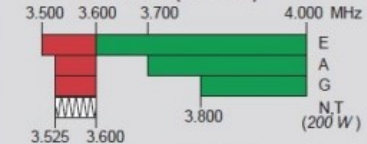
#### 630 Meters (472 kHz)



#### 160 Meters (1.8 MHz)



#### 80 Meters (3.5 MHz)

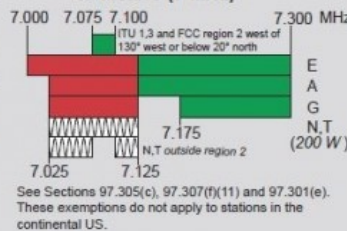


#### 60 Meters (5.3 MHz)

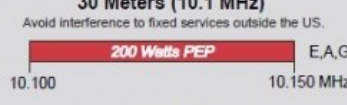


General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated power (ERP) of 100 W PEP relative to a half-wave dipole. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such as PACTOR III. Only one signal at a time is permitted on any channel.

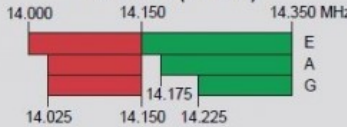
#### 40 Meters (7 MHz)



#### 30 Meters (10.1 MHz)



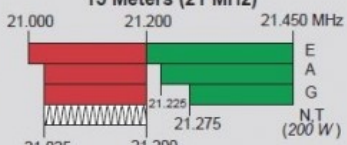
#### 20 Meters (14 MHz)



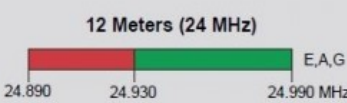
#### 17 Meters (18 MHz)



#### 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](http://www.arrl.org) for detailed band plans.

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Exams: 860-594-0300 email: [vec@arrl.org](mailto:vec@arrl.org)



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](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](mailto: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



# 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<br>(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                    |





# DULUTH AREA REPEATERS, continued

## NARC System NAØRC

147.135 plus 103.5 Knife River  
 145.450 minus 114.8 Park Point (rcv)  
 147.135 plus 114.8 Knife River - Park Point (rcv)

## Stand Alone Repeaters

145.210 minus 110.9 Clam Lake, WI  
 146.880 minus 123.0 Grand Rapids, MN  
 146.910 minus 146.2 Duxbury, MN  
 146.955 minus 146.2 Askov, MN  
 147.105 plus 110.9 Chaffey, WI  
 444.850 +5.00 141.3 Cloquet, MN

## Fusion

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

147.150 plus 151.4 NTØB Gilbert. MN Fusion Repeater  
 145.170 minus 110.9 WA9KLM Superior, WI – Douglas County RACES/ARES Fusion Repeater (Digital only) Fusion Room 28373

145.250 minus 103.5 KBØYHX Cloquet, MN – Carlton County RACES/ARES Fusion Repeater

444.300 +5.00 103.5 NØEO Duluth, MN – 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  
 444.800 +5.00 103.5 NØLCR Grand Marais, MN – Wires X Connected to NØEO Room 40494

## D-Star

147.375 plus NØEO D Star  
 442.200 plus NØEO D Star

Rev. KCØWDQ as of 10/1/22 For ARAC Newsletter

# Elmers

## El-mer / el-mər/ [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... |

# Membership E-mail Directory

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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

# JANUARY

## 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  |
|-----|---|---|--|---|-----|--|
|     | <b>1</b><br><br><b>HAPPY NEW YEAR!</b><br>WX 2000 KCØMKS | <b>2</b><br><b>ARAC BOARD MEETING</b><br>Sammy's Pizza<br>6:30 pm<br>DC Net 2000<br>CC Net 2030 | 3  | 4   | 5   | 6  |
| 7   | <b>8</b><br><b>DC ARES/RACES Mtg</b><br><b>1900 DC EOC</b><br>WX 2000 KCØMKS<br>CW 1930 AAØAW<br>USB 2000 AAØAW<br>ES 2100 KØDSL          | 9   | <b>10</b><br><b>Lake County ARES/RACES Meeting 1800</b><br>Lake County Net 1900<br>2100 - BWAR | <br><b>11</b><br><b>ARAC Club Meeting</b><br>Coppertop Church<br><b>7:00 PM</b> | 12  | 13   |
| 14  | <b>15</b><br>WX 2000 KCØMKS<br>CW 1930 NØPDG<br>USB 2000 KB9WLB<br>ES 2100 KØ9VKI   | <b>16</b><br>DC Net 2000<br>CC Net 2030   | <b>17</b><br><b>St Louis County ARES/RACES Meeting 1800</b><br>2100 - BWAR                     | 18  | 19  | 20   |
| 21  | <b>22</b><br>WX 2000 KCØMKS<br>CW 1930 AAØAW<br>USB 2000 K9KDK<br>ES 2100 KCØWDQ  | <b>23</b><br>DC Net 2000<br>CC Net 2030   | <b>24</b><br>Lake County Net 1900<br>2100 - BWAR   | <b>25</b><br><b>Carlton County ARES/RACES Meeting</b><br><b>1900 CC EOC</b>   | 26  | <b>27</b><br><b>WINTER FIELD DAY</b><br><b>ARAC Club Breakfast</b><br><b>The Chalet</b><br><b>8 am</b> |
| 28  | <b>29</b><br>WX 2000 KCØMKS<br>CW 1930 NØPDG<br>USB 2000 NØVRM<br>ES 2100 WØNWO   | <b>30</b><br>DC Net 2000<br>CC Net 2030   | <b>31</b><br>2100 - BWAR   |   |     |  |
|     |   |   |  |   |     |  |

Get this newsletter *faster*  
via email!

Email Doug AAØAW at  
[aa0aw@arrl.net](mailto:aa0aw@arrl.net)

Next Club Meeting/Christmas Party:  
Thursday,  
*January 11th, 2023 - 7 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:**

Sam Frey KEØYTM

**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](http://www.contestcalendar.com)

**National Contest Journal** at [www.ncjweb.com](http://www.ncjweb.com)

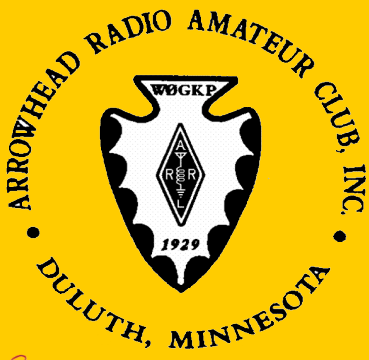
**QSO Party Note:** State/Province/National QSO Parties are abbreviated with the 2 or 3 letter abbreviation for the state/province/national designation followed by QP for QSO Party:

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

**QRZ** web site at [www.qrz.com](http://www.qrz.com)

**VHF Propagation** site at [www.aprs.mountainlake.k12.mn.us](http://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](http://arrl.org).




# The 2023 Thomas J Reibold Award



**The Thomas J Reibold Award**  
honors outstanding service to the  
Arrowhead Radio Amateur Club and to the  
hobby of Ham Radio

**The 2023 Thomas J Reibold Award**  
is hereby awarded to

**Diane Saunders - KØDSL**





# NEXT ARAC CLUB MEETING

Thursday, January 11, 2024  
@ 7:00 p.m.  
at the Coppertop Church!



DOING  
THE MOST  
GOOD®

2023 Holiday Season



**MORE SMILES. LESS STRESS.**  
The holidays bring added financial and emotional stress to families in need.  
Help us brighten the holidays for families in Houston.

Thanks to **ALL our Bell Ringer Volunteers**  
this year and to everyone who donated  
non-perishable food items to the  
**Salvation Army Food Shelf!**



Your efforts  
helped many  
families have a  
wonderful  
holiday meal  
together on  
Christmas!

One of the fantastic volunteer Bellringer  
crews this year.  
L to R: Gene Ellefson, Bruce Carlson, Doug Nelson,  
Melinda Nelson, Rochelle Nelson, Jon Nelson.

**Projects** program. Here's how NASA describes it at <https://science.nasa.gov/citizen-science>:

**“NASA’s citizen science projects** are collaborations between scientists and interested members of the public. Through these collaborations, volunteers (known as citizen scientists) have helped make thousands of important scientific discoveries. More than 410 NASA citizen scientists have been named as co-authors on refereed scientific publications. Want to work on some real NASA science? Click on one of 41 projects to get started. NASA citizen science projects are open to everyone around the world, not limited to U.S. citizens or residents.”

On the site, really cool projects are listed, such as [Cloud Spotting on Mars](#), [Planet Hunters](#), [Aurorasaurus](#), [Solar Activity Region Spotter](#), [Heliophysics Audified: Resonances in Plasmas](#), [Floating Forests](#), [Mapping Application for Penguin Populations in Projective Dynamics](#), [Air Quality Citizen Science](#), and more.

In 2017 a NASA Citizen Science Project was created called **HamSCI**, short for **Ham Radio Science Citizen Investigation**.

Subsequently, several special projects were created under HamSCI, so that NASA scientists could collect important data that amateur radio operators could uniquely provide. Here's HamSCI's specific focus, as stated at <https://hamsci.org/about-hamsci> :

“HamSCI was started by ham-scientists who study upper atmospheric and space physics. These scientists recognized that projects such as the [Reverse Beacon Network](#), [WSPRNet](#), [PSKReporter](#), [DX Cluster](#), [ClubLog](#), and more are generating big data sets that could provide useful observations of the Earth's ionosphere and related systems.

“Because of this, HamSCI's initial focus is on these fields of research. In the future, other researchers may join HamSCI and broaden its scope. For scientists, working with the amateur radio community is a way to access individually managed stations, available by the hundreds in dozens of countries, with receive and transmit capabilities across the electromagnetic spectrum, easily identified in areas of interest and deployed to remote locations, for free.”

HamSCI is primarily run by amateur radio operators at the **University of Scranton Department of Physics and Engineering W3USR**, in cooperation with HamSCI amateur radio scientists at NASA. Additional ongoing collaboration comes from **Case Western Reserve University W8EDU**, the **University of Alabama**, the **New Jersey Institute of Technology Center for Solar Terrestrial Physics K2MFF**, the **MIT Haystack Observatory**, and **Tucson Amateur Packet Radio**. HamSCI is funded by the **United States National Science Foundation**, **NASA**, and **Amateur Radio Digital Communications**.

Here's how HamSCI's "Motivation" is enthusiastically described on their "About" page:

“Since the beginning of the United States Amateur Radio Service in 1912, amateur radio operators have made significant contributions to radio technology and the understanding of radio science. This work must be continued today, as Part 97 of the FCC rules states that a primary purpose of the amateur radio service is the ‘Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.’ Recent advances in the fields of computing, software defined radio, and signal processing provide unprecedented opportunities to meet this mandate, specifically in the field of radio science. These opportunities are already beginning to be realized with the advent of systems such as the Reverse Beacon Network, the Weak Signal Propagation Reporting Network, and PSKReporter. In addition, enabling amateurs to make and contribute legitimate scientific observations will expose amateur radio to a wider community of people interested in science around the world.”

HamSCI has several past and ongoing projects for potential participants to review, and welcomes amateur radio operators to join the active projects in-process at any time. More participants, of course, means more available data, so HamSCI invites interested amateur radio operators to query, comment and join!



**Ham Radio Station at the University of Scranton**

Byron Maldonado snapped this photo of Lead HamSCI Organizer **Dr. Nathaniel Frissell W2NAF**, **Veronica Romanek KD2UHN** and **Simal Sami KC3UAW**. *Image courtesy of The University of Scranton.*

*Continued on Page 16*

To give you an cursory view, below is a summary table of Active projects on HamSCI's Projects tab:

| Project  | Description   | Science Questions   |
|--|---|---|
| <b>2023 &amp; 2024 Solar Eclipses</b>                                | Concurrent with the October 14, 2023 and April 8, 2024 annular and total North American eclipses, the worldwide amateur (ham) radio community will be creating data for space physics research. They will do so by transmitting, receiving and recording signals across the HF radio spectrum. The operating format will be a series of friendly ham radio competitions and researcher-led experiments.                                 | <ul style="list-style-type: none"> <li>• How does the ionosphere couple with the neutral atmosphere and with space?</li> <li>• How do solar eclipses impact ionospheric structure and dynamics?</li> </ul>  |
| <b>Personal Space Weather Station</b>                                | The Personal Space Weather Station project ultimately aims to create a small, multi-instrument system that can make ground-based measurements of the space environment.   | <ul style="list-style-type: none"> <li>• How does the ionosphere respond to inputs from space and from the neutral atmosphere?</li> <li>• How does the ionosphere couple with the neutral atmosphere and with space?</li> </ul>   |
| <b>Sources and Measurement of Traveling Ionospheric Disturbances</b> | Traveling Ionospheric Disturbances (TIDs) are variations in the ionosphere that can impact medium frequency (MF) and high frequency (HF) radio communications through fading (QSB) and by causing variations in communications distance. In this project, we use data from large-scale amateur radio networks such as the Reverse Beacon Network, WSPRnet, and PSKReporter to study the sources, characteristics, and dynamics of TIDs. | <ul style="list-style-type: none"> <li>• How does energy move from the lower atmosphere to the upper atmosphere to generate TIDs?</li> <li>• What percentage of observed TIDs correlated with geomagnetic activity what percentage are not?</li> <li>• What is the TID longitudinal dependence on 2D stratospheric polar vortex configuration?</li> </ul> |

As you can see, our current solar cycle is the focus on one the active projects, with research data collection regarding the total solar eclipses on October 14th of last year and April 8, 2024.

If you're on NASA's email list or visit their website's solar eclipse page (<https://science.nasa.gov/get-involved/citizen-science/ham-radio-operators-we-need-your-help-during-solar-eclipses/>) for all the latest eclipse news, you saw this call to hams from their Science Editorial Team:

"Ham Radio operators, we're calling you! Members of the Ham Radio Science Citizen Investigation (HamSCI) will be making radio contacts during the 2023 and 2024 North American eclipses, probing the Earth's ionosphere. It will be a fun, friendly event with a competitive element—and you're invited to participate."

Didn't get a chance to assist in data collection for the October 14th eclipse? Jump in on the project and help NASA gain valuable research on April 8th! You can view all the upcoming details in the Solar Eclipse QSO Party Rules page at <https://hamsci.org/seqp-rules>

The April 2024 "Weather Issue" of The Relay will focus on solar eclipses this year, but we'll only be able to refer to NASA data collected so far on the October 14 eclipse in this solar cycle. We'd love to hear from all who participate in the April eclipse event so that we can print your comments and photos in the May Relay.

To read further about HamSCI and join the organization to participate in current and upcoming scientific data collection, go to their **Get Involved** tab at <https://hamsci.org/get-involved>.

There you'll find choices to participate in HamSCI Google Groups, TAPR Listserv and Telecons. You can also participate in the **2024 HamSCI Workshop: Alignment** on March 22-23 at Case Western Reserve University in Cleveland, Ohio. To join or ask questions, email **Nathaniel W2NAF** at [hamsci@hamsci.org](mailto:hamsci@hamsci.org)

*Our contributions to scientific data as citizen scientists is truly essential to NASA's work, so answer the call! ★*





# Contest Calendar - January 2024

|  |  |
|--|--|
| <a href="#"><u>+ AGB New Year Snowball Contest</u></a>       | 0000Z-0100Z, Jan 1   |
| <a href="#"><u>+ K1USN Slow Speed Test</u></a>               | 0000Z-0100Z, Jan 1   |
| <a href="#"><u>+ SARTG New Year RTTY Contest</u></a>         | 0800Z-1100Z, Jan 1   |
| <a href="#"><u>+ AGCW Happy New Year Contest</u></a>         | 0900Z-1200Z, Jan 1   |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>              | 1300Z-1400Z, Jan 1   |
| <a href="#"><u>+ AGCW VHF/UHF Contest</u></a>                | 1400Z-1700Z, Jan 1 (144) and<br>1700Z-1800Z, Jan 1 (432)   |
| <a href="#"><u>+ OK1WC Memorial</u></a>                      | 1630Z-1729Z, Jan 1   |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>              | 1900Z-2000Z, Jan 1   |
| <a href="#"><u>+ Worldwide Sideband Activity Contest</u></a> | 0100Z-0159Z, Jan 2   |
| <a href="#"><u>+ ARS Spartan Sprint</u></a>                  | 0200Z-0400Z, Jan 2   |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>              | 0300Z-0400Z, Jan 2   |
| <a href="#"><u>+ QRP Fox Hunt</u></a>                        | 0200Z-0330Z, Jan 3   |
| <a href="#"><u>+ Phone Weekly Test</u></a>                   | 0230Z-0300Z, Jan 3   |
| <a href="#"><u>+ A1Club AWT</u></a>                          | 1200Z-1300Z, Jan 3   |
| <a href="#"><u>+ CWops Test</u></a>                          | 1300Z-1400Z, Jan 3   |
| <a href="#"><u>+ Mini-Test 40</u></a>                        | 1700Z-1759Z, Jan 3   |
| <a href="#"><u>+ VHF-UHF FT8 Activity Contest</u></a>        | 1700Z-2100Z, Jan 3   |
| <a href="#"><u>+ Mini-Test 80</u></a>                        | 1800Z-1859Z, Jan 3   |
| <a href="#"><u>+ CWops Test</u></a>                          | 1900Z-2000Z, Jan 3   |
| <a href="#"><u>+ UKEICC 80m Contest</u></a>                  | 2000Z-2100Z, Jan 3   |
| <a href="#"><u>+ Walk for the Bacon QRP Contest</u></a>      | 0000Z-0100Z, Jan 4 and<br>0200Z-0300Z, Jan 5   |
| <a href="#"><u>+ CWops Test</u></a>                          | 0300Z-0400Z, Jan 4   |
| <a href="#"><u>+ CWops Test</u></a>                          | 0700Z-0800Z, Jan 4   |
|  | 1800Z-1900Z, Jan 4 (CW) and<br>1900Z-2000Z, Jan 4 (SSB) and<br>2000Z-2100Z, Jan 4 (FM) and<br>2100Z-2200Z, Jan 4 (Dig) |
| <a href="#"><u>+ NRAU 10m Activity Contest</u></a>           |  |

*Continued on Page 18*



# Contest Calendar - January 2024

|   |  |
|---|--|
| <a href="#"><u>+ SKCC Sprint Europe</u></a>                   | 2000Z-2200Z, Jan 4                           |
| <a href="#"><u>+ NCCC FT4 Sprint</u></a>                      | 0100Z-0130Z, Jan 5                           |
| <a href="#"><u>+ Weekly RTTY Test</u></a>                     | 0145Z-0215Z, Jan 5                           |
| <a href="#"><u>+ QRP Fox Hunt</u></a>                         | 0200Z-0330Z, Jan 5                           |
| <a href="#"><u>+ NCCC Sprint</u></a>                          | 0230Z-0300Z, Jan 5                           |
| <a href="#"><u>+ K1USN Slow Speed Test</u></a>                | 2000Z-2100Z, Jan 5                           |
| <a href="#"><u>+ PODXS 070 Club PSKFest</u></a>               | 0000Z-2400Z, Jan 6                           |
| <a href="#"><u>+ Marconi Club ARI Loano QSO Party Day</u></a> | 0700Z-2100Z, Jan 6                           |
| <a href="#"><u>+ WW PMC Contest</u></a>                       | 1200Z, Jan 6 to 1200Z, Jan 7                 |
| <a href="#"><u>+ RSGB AFS Contest, CW</u></a>                 | 1300Z-1700Z, Jan 6                           |
| <a href="#"><u>+ ARRL Kids Day</u></a>                        | 1800Z-2359Z, Jan 6                           |
| <a href="#"><u>+ ARRL RTTY Roundup</u></a>                    | 1800Z, Jan 6 to 2400Z, Jan 7                 |
| <a href="#"><u>+ EUCW 160m Contest</u></a>                    | 2000Z-2300Z, Jan 6 and<br>0400Z-0700Z, Jan 7 |
| <a href="#"><u>+ K1USN Slow Speed Test</u></a>                | 0000Z-0100Z, Jan 8                           |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>               | 1300Z-1400Z, Jan 8                           |
| <a href="#"><u>+ OK1WC Memorial</u></a>                       | 1630Z-1729Z, Jan 8                           |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>               | 1900Z-2000Z, Jan 8                           |
| <a href="#"><u>+ Worldwide Sideband Activity Contest</u></a>  | 0100Z-0159Z, Jan 9                           |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>               | 0300Z-0400Z, Jan 9                           |
| <a href="#"><u>+ DARC RTTY Sprint</u></a>                     | 1800Z-1929Z, Jan 9                           |
| <a href="#"><u>+ QRP Fox Hunt</u></a>                         | 0200Z-0330Z, Jan 10                          |
| <a href="#"><u>+ Phone Weekly Test</u></a>                    | 0230Z-0300Z, Jan 10                          |
| <a href="#"><u>+ A1Club AWT</u></a>                           | 1200Z-1300Z, Jan 10                          |
| <a href="#"><u>+ CWops Test</u></a>                           | 1300Z-1400Z, Jan 10                          |
| <a href="#"><u>+ Mini-Test 40</u></a>                         | 1700Z-1759Z, Jan 10                          |

*Continued on Page 19*



# Contest Calendar - January 2024

|  |                                |
|--|--------------------------------|
| <a href="#"><u>+ VHF-UHF FT8 Activity Contest</u></a>            | 1700Z-2100Z, Jan 10            |
| <a href="#"><u>+ Mini-Test 80</u></a>                            | 1800Z-1859Z, Jan 10            |
| <a href="#"><u>+ CWops Test</u></a>                              | 1900Z-2000Z, Jan 10            |
| <a href="#"><u>+ CWops Test</u></a>                              | 0300Z-0400Z, Jan 11            |
| <a href="#"><u>+ CWops Test</u></a>                              | 0700Z-0800Z, Jan 11            |
| <a href="#"><u>+ EACW Meeting</u></a>                            | 1900Z-2000Z, Jan 11            |
| <a href="#"><u>+ NCCC FT4 Sprint</u></a>                         | 0100Z-0130Z, Jan 12            |
| <a href="#"><u>+ Weekly RTTY Test</u></a>                        | 0145Z-0215Z, Jan 12            |
| <a href="#"><u>+ QRP Fox Hunt</u></a>                            | 0200Z-0330Z, Jan 12            |
| <a href="#"><u>+ NCCC Sprint</u></a>                             | 0230Z-0300Z, Jan 12            |
| <a href="#"><u>+ K1USN Slow Speed Test</u></a>                   | 2000Z-2100Z, Jan 12            |
| <a href="#"><u>+ YB DX Contest</u></a>                           | 0000Z-2359Z, Jan 13            |
| <a href="#"><u>+ UBA PSK63 Prefix Contest</u></a>                | 1200Z, Jan 13 to 1200Z, Jan 14 |
| <a href="#"><u>+ SKCC Weekend Sprintathon</u></a>                | 1200Z, Jan 13 to 2400Z, Jan 14 |
| <a href="#"><u>+ North American QSO Party, CW</u></a>            | 1800Z, Jan 13 to 0559Z, Jan 14 |
| <a href="#"><u>+ WAB 1.8 MHz Phone</u></a>                       | 1900Z-2300Z, Jan 13            |
| <a href="#"><u>+ NRAU-Baltic Contest, SSB</u></a>                | 0630Z-0830Z, Jan 14            |
| <a href="#"><u>+ DARC 10-Meter Contest</u></a>                   | 0900Z-1059Z, Jan 14            |
| <a href="#"><u>+ NRAU-Baltic Contest, CW</u></a>                 | 0900Z-1100Z, Jan 14            |
| <a href="#"><u>+ RSGB AFS Contest, Data</u></a>                  | 1300Z-1700Z, Jan 14            |
| <a href="#"><u>+ K1USN Slow Speed Test</u></a>                   | 0000Z-0100Z, Jan 15            |
| <a href="#"><u>+ 4 States QRP Group Second Sunday Sprint</u></a> | 0100Z-0300Z, Jan 15            |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>                  | 1300Z-1400Z, Jan 15            |
| <a href="#"><u>+ OK1WC Memorial</u></a>                          | 1630Z-1729Z, Jan 15            |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>                  | 1900Z-2000Z, Jan 15            |
| <a href="#"><u>+ Worldwide Sideband Activity Contest</u></a>     | 0100Z-0159Z, Jan 16            |

*Continued on Page 20*



# Contest Calendar - January 2024

|  |  |
|--|--|
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>          | 0300Z-0400Z, Jan 16                            |
| <a href="#"><u>+ QRP Fox Hunt</u></a>                    | 0200Z-0330Z, Jan 17                            |
| <a href="#"><u>+ Phone Weekly Test</u></a>               | 0230Z-0300Z, Jan 17                            |
| <a href="#"><u>+ A1Club AWT</u></a>                      | 1200Z-1300Z, Jan 17                            |
| <a href="#"><u>+ CWops Test</u></a>                      | 1300Z-1400Z, Jan 17                            |
| <a href="#"><u>+ Mini-Test 40</u></a>                    | 1700Z-1759Z, Jan 17                            |
| <a href="#"><u>+ VHF-UHF FT8 Activity Contest</u></a>    | 1700Z-2100Z, Jan 17                            |
| <a href="#"><u>+ Mini-Test 80</u></a>                    | 1800Z-1859Z, Jan 17                            |
| <a href="#"><u>+ CWops Test</u></a>                      | 1900Z-2000Z, Jan 17                            |
| <a href="#"><u>+ Walk for the Bacon QRP Contest</u></a>  | 0000Z-0100Z, Jan 18 and<br>0200Z-0300Z, Jan 19 |
| <a href="#"><u>+ NAQCC CW Sprint</u></a>                 | 0130Z-0330Z, Jan 18                            |
| <a href="#"><u>+ CWops Test</u></a>                      | 0300Z-0400Z, Jan 18                            |
| <a href="#"><u>+ CWops Test</u></a>                      | 0700Z-0800Z, Jan 18                            |
| <a href="#"><u>+ NTC QSO Party</u></a>                   | 1900Z-2000Z, Jan 18                            |
| <a href="#"><u>+ NCCC FT4 Sprint</u></a>                 | 0100Z-0130Z, Jan 19                            |
| <a href="#"><u>+ Weekly RTTY Test</u></a>                | 0145Z-0215Z, Jan 19                            |
| <a href="#"><u>+ QRP Fox Hunt</u></a>                    | 0200Z-0330Z, Jan 19                            |
| <a href="#"><u>+ NCCC Sprint</u></a>                     | 0230Z-0300Z, Jan 19                            |
| <a href="#"><u>+ K1USN Slow Speed Test</u></a>           | 2000Z-2100Z, Jan 19                            |
| <a href="#"><u>+ PRO Digi Contest</u></a>                | 1200Z, Jan 20 to 1159Z, Jan 21                 |
| <a href="#"><u>+ Hungarian DX Contest</u></a>            | 1200Z, Jan 20 to 1159Z, Jan 21                 |
| <a href="#"><u>+ RSGB AFS Contest, SSB</u></a>           | 1300Z-1700Z, Jan 20                            |
| <a href="#"><u>+ North American QSO Party, SSB</u></a>   | 1800Z, Jan 20 to 0559Z, Jan 21                 |
| <a href="#"><u>+ NA Collegiate Championship, SSB</u></a> | 1800Z, Jan 20 to 0559Z, Jan 21                 |
| <a href="#"><u>+ ARRL January VHF Contest</u></a>        | 1900Z, Jan 20 to 0359Z, Jan 22                 |

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# Contest Calendar - January 2024

|  |  |
|--|--|
| <a href="#"><u>+ Feld Hell Sprint</u></a>                    | 2000Z, Jan 20 to 0559Z, Jan 21                                       |
| <a href="#"><u>+ Classic Exchange, CW</u></a>                | 1300Z, Jan 21 to 0700Z, Jan 22 and<br>1300Z, Jan 23 to 0700Z, Jan 24 |
| <a href="#"><u>+ Run for the Bacon QRP Contest</u></a>       | 2300Z, Jan 21 to 0100Z, Jan 22                                       |
| <a href="#"><u>+ K1USN Slow Speed Test</u></a>               | 0000Z-0100Z, Jan 22  |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>              | 1300Z-1400Z, Jan 22  |
| <a href="#"><u>+ OK1WC Memorial</u></a>                      | 1630Z-1729Z, Jan 22  |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>              | 1900Z-2000Z, Jan 22  |
| <a href="#"><u>+ Worldwide Sideband Activity Contest</u></a> | 0100Z-0159Z, Jan 23  |
| <a href="#"><u>+ ICWC Medium Speed Test</u></a>              | 0300Z-0400Z, Jan 23  |
| <a href="#"><u>+ SKCC Sprint</u></a>                         | 0000Z-0200Z, Jan 24  |
| <a href="#"><u>+ QRP Fox Hunt</u></a>                        | 0200Z-0330Z, Jan 24  |
| <a href="#"><u>+ Phone Weekly Test</u></a>                   | 0230Z-0300Z, Jan 24  |
| <a href="#"><u>+ A1Club AWT</u></a>                          | 1200Z-1300Z, Jan 24  |
| <a href="#"><u>+ CWops Test</u></a>                          | 1300Z-1400Z, Jan 24  |
| <a href="#"><u>+ Mini-Test 40</u></a>                        | 1700Z-1759Z, Jan 24  |
| <a href="#"><u>+ Mini-Test 80</u></a>                        | 1800Z-1859Z, Jan 24  |
| <a href="#"><u>+ CWops Test</u></a>                          | 1900Z-2000Z, Jan 24  |
| <a href="#"><u>+ NAQCC CW Sprint</u></a>                     | 0130Z-0330Z, Jan 25  |
| <a href="#"><u>+ CWops Test</u></a>                          | 0300Z-0400Z, Jan 25  |
| <a href="#"><u>+ CWops Test</u></a>                          | 0700Z-0800Z, Jan 25  |
| <a href="#"><u>+ Australia Day Contest</u></a>               | 2200Z, Jan 25 to 1000Z, Jan 26                                       |
| <a href="#"><u>+ NCCC FT4 Sprint</u></a>                     | 0100Z-0130Z, Jan 26  |
| <a href="#"><u>+ Weekly RTTY Test</u></a>                    | 0145Z-0215Z, Jan 26  |
| <a href="#"><u>+ QRP Fox Hunt</u></a>                        | 0200Z-0330Z, Jan 26  |
| <a href="#"><u>+ NCCC Sprint</u></a>                         | 0230Z-0300Z, Jan 26  |

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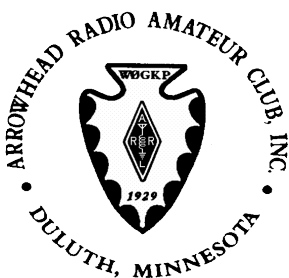
# Contest Calendar - January 2024

- [+ K1USN Slow Speed Test](#)
- [+ CQ 160-Meter Contest, CW](#)
- [+ REF Contest, CW](#)
- [+ BARTG RTTY Sprint](#)
- [+ UBA DX Contest, SSB](#)
- [+ Winter Field Day](#)
  
- [+ Classic Exchange, Phone](#)
  
- [+ K1USN Slow Speed Test](#)
- [+ ICWC Medium Speed Test](#)
- [+ QCX Challenge](#)
- [+ OK1WC Memorial](#)
- [+ QCX Challenge](#)
- [+ ICWC Medium Speed Test](#)
- [+ Worldwide Sideband Activity Contest](#)
- [+ ICWC Medium Speed Test](#)
- [+ QCX Challenge](#)
- [+ QRP Fox Hunt](#)
- [+ Phone Weekly Test](#)
- [+ A1Club AWT](#)
- [+ CWops Test](#)
- [+ Mini-Test 40](#)
- [+ Mini-Test 80](#)
- [+ CWops Test](#)
- [+ UKEICC 80m Contest](#)

- 2000Z-2100Z, Jan 26
- 2200Z, Jan 26 to 2200Z, Jan 28
- 0600Z, Jan 27 to 1800Z, Jan 28
- 1200Z, Jan 27 to 1200Z, Jan 28
- 1300Z, Jan 27 to 1300Z, Jan 28
- 1900Z, Jan 27 to 1900Z, Jan 28
- 1300Z, Jan 28 to 0700Z, Jan 29 and  
1300Z, Jan 30 to 0700Z, Jan 31
- 0000Z-0100Z, Jan 29
- 1300Z-1400Z, Jan 29
- 1300Z-1400Z, Jan 29
- 1630Z-1729Z, Jan 29
- 1900Z-2000Z, Jan 29
- 1900Z-2000Z, Jan 29
- 0100Z-0159Z, Jan 30
- 0300Z-0400Z, Jan 30
- 0300Z-0400Z, Jan 30
- 0200Z-0330Z, Jan 31
- 0230Z-0300Z, Jan 31
- 1200Z-1300Z, Jan 31
- 1300Z-1400Z, Jan 31
- 1700Z-1759Z, Jan 31
- 1800Z-1859Z, Jan 31
- 1900Z-2000Z, Jan 31
- 2000Z-2100Z, Jan 31

Our thanks to Bruce Horn, WA7BNM for use of this calendar!  
Visit Bruce at [www.contestcalendar.com/contestcal.html](http://www.contestcalendar.com/contestcal.html)

## The ARAC RELAY



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