



The RELAY)))

APRIL
2022

The Weather Issue

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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Kim & Steve Waller

Kim - KEØNQS Steve - KEØNQT
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SPRING 2022



Join us on
Facebook!

SKYWARN TRAINING

Spotting Severe Weather is Our Specialty!

April is here, and with the warmer temperatures comes the sometimes volatile weather of Northland springs. This is when the National Weather Service holds the first free 2-hour **Skywarn Weather Training** of the year to train volunteers in the community to help identify and report, as official Skywarn spotters, severe weather such as large hail, damaging winds and tornadoes. This month's scheduled **ARAC Club meeting** will host Skywarn Training that is open to the public and start one hour earlier than usual. See page 10 for details. As always, it's important to note that weather spotters are *not* storm chasers. Professional "Storm Chasers" are typically meteorologists traveling toward storms to study and document, via trucks equipped with special instrumentation, severe weather in order to advance the science of predictive modeling.

Since the 1970s, SKYWARN® spotters have helped the National Weather Service issue timely and accurate warnings in their region to protect lives and property.

The National Weather Service says, "There can be no finer reward than to know that their efforts have given communities the precious gift of time, the seconds and minutes which can help save lives."

Who can be a spotter? Well, anyone who spends time outdoors will benefit from Skywarn training, and because ham radio operators play an important role in public safety, the National Weather Service strongly encourages us to become Skywarn spotters and attend training every 4 years to refresh.



Rotating Storm Cloud Image Courtesy GetWallpapers.com

Continued on Page 16

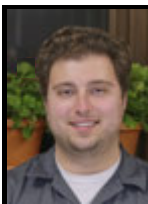
ARAC Board Meeting - March 1, 2022

PRESIDENT



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

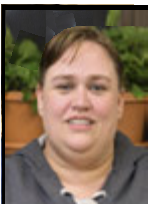
VICE PRESIDENT



K0DJP
David Pyriik

david.pyriik@gmail.com

SECRETARY



KF0GJW
Melinda Nelson

TREASURER



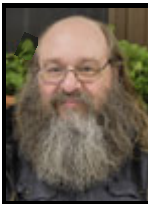
KN0NUL
Bruce Carlson
906 Anderson Rd
Duluth, MN 55811
763-315-2967
carlsbr@gmail.com

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

Present:

Board Members

Gene Ellefsen-N0VRM, David Pyriik-K0DJP, Melinda Nelson-KF0GJW, Bruce Carlson-KN0NUL, Gary Minter-KD9ABS, Dave Davis-AA0AC, Doug Nelson-AA0AW

Board Advisors (Non-Board Members)

Technical Advisor on Repeaters, Randy Wabik-KR0B; Parliamentarian Advisor, Grant Forsyth – KC0WUP

Guests

Elmer Berg-KC0NGY, Del Minter-KE0CLI, Wendy Stanford

Meeting called to order by President Gene-N0VRM at 18:30 (6:30 pm)

Minutes:

Posted on the web page and in the newsletter. Moved to approve by Gary Minter – KD9ABS, seconded by Bruce Carlson – KN0NUL, motion passed.

Treasurer's Report:

Checking: \$1,568.04

Savings: \$1,074.33

Repeater: \$4,050.70

Subtotal Cash \$6,692.44

Winter CD : \$1,730.42

Summer CD: \$0.00

Subtotal CD: \$1,730.42

Assets Subtotal: \$8,422.86

Motion to accept by Doug Nelson – AA0AW, seconded by Dave Davis – AA0AC, motion passed.

Repeater:

Randy Wabik – KR0B, has been unable to contact the company in California regarding the AMP. Randy Haglin – N0BZZ will take the old equipment from Mahtowa. Was too cold to do any work down in Mahtowa. Randy Wabik needed to take a break in the month of February.

Only need an amplifier and the batteries for the UPS for the Mahtowa location.

Testing:

Doug Nelson – AA0AW HamFest is registered for testing. A new Technician Wendy Stanford just waiting on her call sign. If anyone needs testing contact Doug at AA0AW@ARRL.net and they will test individually.

Continued on Page 3

ARAC Board Meeting - continued from page 2

HamFest:

Approved the prize money last month. Motion made by Doug Nelson – AA0AW to not exceed \$500.00 for food, seconded by Gary Minter – KD9ABS, motion passed. Motion made by Doug Nelson – AA0AW to not exceed \$200.00 for door prizes, seconded by Gary Minter – KD9ABS, motion passed.

Anything new to bring up:

Doug Nelson – AA0AW motion to end the zoom meeting as Covid restraints have lifted. The meeting attendance has been low. Only 3 or 4 people are attending the zoom meetings. Effective April no longer going to broadcast club meetings. Seconded by Melinda Nelson – KF0GJW, motion passed.

Skywarn training at the April meeting. Members, please sit towards the rear as this is open to the public as well. Meeting will start at 18:00 (6:00 pm) on April 14, 2022.

Grandma's Marathon – Anyone who worked a spot last year it is your spot unless you contact Doug Nelson – AA0AW that you are unable to assist this year. 2022

Grandma's Marathon Volunteer Registration is ready – <http://grandmasmarathon.volunteerlocal.com/volunteer>. Password is **HAM22**. You will need to enter the password at the top of the page, otherwise the Ham Radio Volunteer position will be hidden. If you have volunteered before, can you let us know your location.

Gene received a letter regarding the 501C3 application. Due to us already being 501C7 which is tax exempt, we must do the long form which will cost \$500.00. The original \$275 will be returned to us for the short form that we filled out. Motion made to spend the funds to do the long form by Dave Davis – AA0AC, seconded by Melinda Nelson – KF0GJW, motion passed.

Motion to adjourn by Doug Nelson – AA0AW, seconded by Gary Minter – KD9ABS, motion passed at 19:09 (7:09 pm)





ARAC Club Meeting Minutes

March 10, 2022

Present:

President: Gene Ellefsen – N0VRM
Vice President: Dave Pyrlik – K0DJP
Treasurer/Membership: Bruce Carlson – KN0NUL
Secretary: Melinda Nelson – KF0GJW
First Year Board: Doug Nelson – AA0AW
Second Year Board: Dave Davis – AA0AC
Third Year Board: Gary Minter – KD9ABS
Special Events: Open/Gene Ellefsen – N0VRM (acting)
HamFest/Education: Bob Schultz – KC0NFB
Property/Picnic: Scott Ahlgren – N0VYU
Repeater: Randy Wabik – KR0B
Repeater: Dave Pyrlik – K0DJP
Testing: Doug Nelson – AA0AW
Newsletter/Historian: Kim Waller – KE0NWS
Newsletter/Historian: Scott Waller – KE0NQS
Parliamentarian: Grant Forsyth – KC0WUP

Absent:

Chaplin:
Web Site: Thomas Dorr – KE0RHA

Meeting called to order at 19:02 (7:02 PM) by President Gene Ellefsen – N0VRM. Thirty-eight members in attendance.

Minutes:

Posted on the web page and in the newsletter. Motion to approve by Dave Davis – AA0AC, seconded by Mike Lovold – N0PDG, motion passed.

Treasurer's Report:

Checking: \$1,568.04
Savings: \$1,074.33
Repeater: \$4,050.70
Subtotal Cash \$6,692.44

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

Assets Subtotal: \$8,422.86

Motion to accept as presented by Jeff Nast KC0MKS, seconded by Randy Wabik – KR0B, motion passed.

Repeater:

Randy Wabik – KR0B, has been unable to contact the company in California regarding the AMP. Randy Haglin – N0BZZ will take the old equipment from Mahtowa. Was too cold to do any work down in Mahtowa. Randy Wabik needed to take a break in the month of February.

Only need an amplifier and the batteries for the UPS for the Mahtowa location.

Board Meeting Motions:

- ♦ Motion to end the zoom program. Doug Nelson – AA0AW was the one that brought this up but that was prior to the gas price increase. Doug Nelson – AA0AW suggest that we recall this motion until after the oil and gas prices become reasonable again. Motion to approve by Mike Lovold – N0PDG to pass the end of the zoom program, no second. Motion died.

Continued on Page 5



ARAC Club Meeting Minutes, continued

- ◆ Long form for the 501C3 which will cost \$500.00. We will receive the \$275.00 from the short form back. Motion to approve Jeff Nast – KC0MKS, seconded by Mike Lovold – N0PDG, motion passed
- ◆ Door prizes for HamFest, not to exceed \$200.00. Motion to made by Grant Forsyth – KC0WUP, seconded by Doug Nelson – AA0AW, motion passed.
- ◆ Food for HamFest, not to exceed \$500.00. Motion to made by Robin Davis, seconded by Wendy Stanford – K04YJO, motion passed,

HamFest:

May 7th, 2022, from 9:00 AM to 13:00 (1:00 PM). Currently up to twenty-three tables. We are shooting for seventy tables. Just remember we need door prizes, help with kitchen, set up and tear down. HRO has interest in showing up at our HamFest to Demo new radios, they will not be selling. The club should try and get Yaesu and Icom to come and demo radios as well, as they will be at other HamFest.

Education:

Currently nothing until the Fall. Next class will start in September. If you need tutoring Bob Schultz – KC0NFB is available.

Testing:

Registered for testing at the HamFest. Nothing big scheduled till then. If you are ready to test, we will still do individual testing. Contact Doug Nelson if you are ready at AA0AW@ARRL.net.

Grandma's Marathon:

Anyone who worked a spot last year it is your spot unless you contact Doug Nelson – AA0AW that you are unable to assist this year. 2022 Grandma's Marathon Volunteer Registration is ready – <http://grandmasmarathon.volunteerlocal.com/volunteer>. Password is **HAM22**. You will need to enter the password at the top of the page, otherwise the Ham Radio Volunteer position will be hidden. If you have volunteered before, can you let us know your location.

Field day:

4th Saturday in June. We are looking for a chairperson to coordinate a space for the club.

Tuesday Coffee

Every second, third, and fourth Tuesday at the House of Refuge located at 115 W Myrtle St. Duluth, MN 55811 from 17:30 (5:30 PM) to 19:30 (7:30 PM). If you have a question or looking to upgrade, or if you wish to just get together and chat. Everyone is welcome.

New members/Ham's:

Welcome to the club and the hobby!

Wendy Stanford – K04YJO

Nancy Carter – KE0VKG

Ben Keppers – KE0MQG

Adam – KF0HZQ

Door Prize was won by Doug Nelson – AA0AW.

Motion to adjourn by Mike Lovold – N0PDG, seconded by Robin Davis, motion passed at 19:34 (7:34 PM). Program featuring Bob Heil from Heil Sound.





Prez Sez...

Hi everyone,

We are coming up to a busy time for the Club so we need your help!

The April 14 Club meeting will start at 6:00 PM, with Skywarn Training starting at 6:30PM. The Training is open to the Public so please leave the front rows of seats available to our guests.

Hamfest is Saturday May 7. This is our big money maker for the Club!! We need setup help at 6:00 AM to get the tables ready for the vendors. The doors open up for vendors at 7:00 AM and the public at 9:00 AM. We could also use help selling tickets outside, along with Kitchen help and take down help at the end of Hamfest. Door Prize Donations are also needed!!!!

Check out the website and the Club Facebook pages for ham radio equipment for sale by Gary Grivna KØGX. Gary runs Electronix Servicing, and he repairs ham radios, so you can rest assured this equipment has been checked out and is in good operating condition.

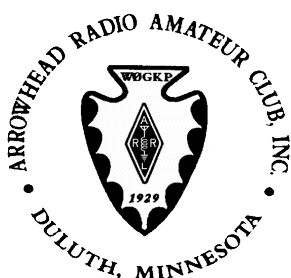
Needed: Net Control Operators for the Sunday night ARAC 10 Meter SSB Net and the Southern St. Louis County Emergency Services Net on the 94 Repeater. It takes less than hour of your time. If interested, please contact me for more info.

73, Gene Ellefsen NØVRM
Club President

CLUB REPEATER WØGKP

146.94 (-)
CTCSS TONE

The ARAC RELAY



Published monthly and distributed free to members, "The RELAY" is the official publication of the Arrowhead Radio Amateur Club, Inc. Members are encouraged to submit articles, opinions, and classifieds. Your submission will be placed as soon as possible providing it does not conflict with the bylaws of the Arrowhead Radio Amateur Club, Inc. The editors reserve the right to omit any submission that is not a required item. If a submission is questionable, it will be presented to the Board of Directors at the next scheduled board meeting for authorization.





U.S. AIR FORCE MILITARY AUXILIARY RADIO SYSTEM

Minnesota State MARS Director
Reginald B. Cass / AFS5MN

Gene Ellefsen
NØVRM

Thank you for your time and interest.

Air Force MARS membership could be for you. We do hope that it is.

If you have the following interests, and capabilities, we are interested in recruiting you to become an Air Force MARS member. Completion of the following on line training is mandatory:

Personally, Identifiable Information (PII) <https://iatraining.disa.mil/eta/piiv2/launchPage.htm>
Cyber Awareness https://iatraining.disa.mil/eta/disa_cac2018/launchPage.htm

If you have completed: [Incident Command System](#) (ICS) -100, 200, 700, and 800 training, and have obtained certification for Air Force MARS or are willing to obtain this training, again, Air Force MARS could be for you.

You must be interested in joining a group of individuals that are dedicated to amateur radio, emergency communications, and willingness to learn and used military communications procedures for voice and digital communications.

You must have equipment that will meet the minimum requirements for voice and digital operation. The equipment will be: transmitter, receiver, (transceiver) modified to operate out of amateur radio bands, computer, modem, and antenna's that are designed to operate on military assigned frequencies. (The best antennas will be a dipole cut to the operational frequency. NVIS antennas work best. You will not need a linear amplifier, however if you have one that will operate on out of amateur radio bands that will be a plus)

You must go through and complete training. You are allowed up to 180 days to do so.

Air Force MARS operation's and procedures are based upon "MARS Operating Instruction", (MOI). The MOI manual uses as its basis for instruction a series of Allied Communications Publications (ACP's), Department of Defense Directives, Department of Defense Instructions, and Department of Defense Manual.

If you already belong to a MARS program and would like to consider Air Force MARS, please contact one of the recruiting team members.

Our recruitment team is as follows:

AFA5XK Dave, WB7DRU wb7dru@gmail.com


AFA5ZV Randy, KRØB afa5zv@gmail.com

AFA5JY Reg, KAØRJY reg_cass@msn.com

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 —●—●—●—●
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US Amateur Radio Bands

US AMATEUR POWER LIMITS

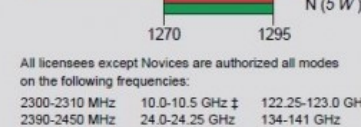
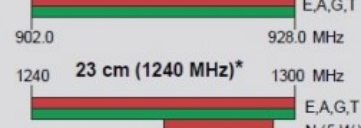
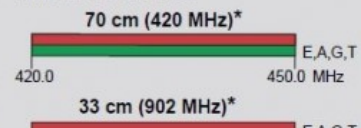
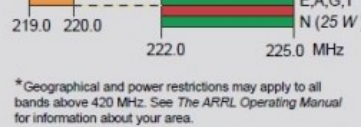
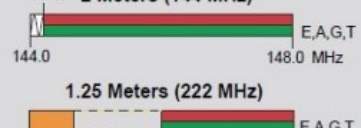
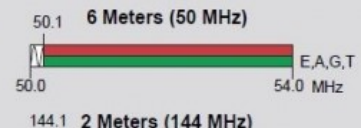
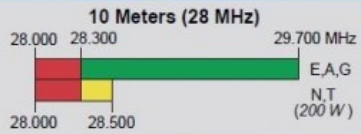
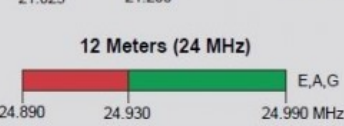
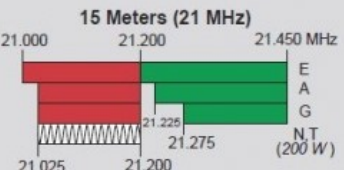
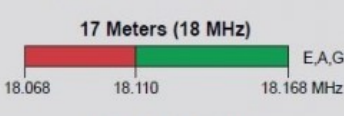
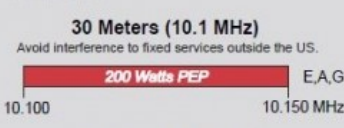
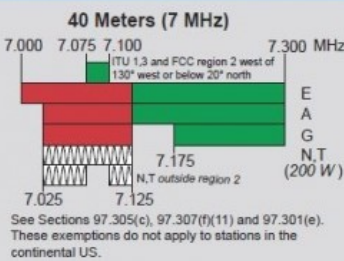
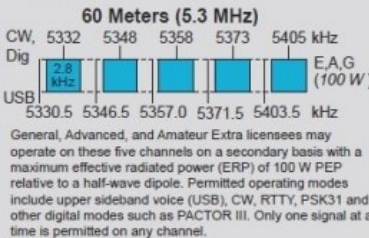
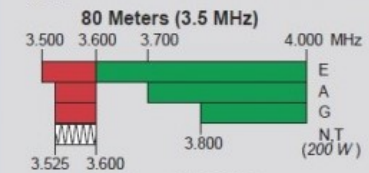
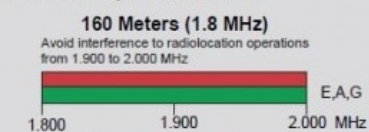
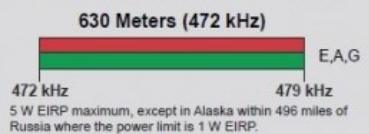
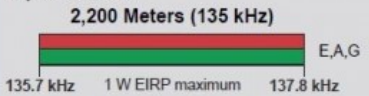
FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

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



ARRL The national association for AMATEUR RADIO®

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.



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

‡ No pulse emissions

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:
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email: orders@arrl.org

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www.arrl.org/membership
Toll-Free 1-888-277-5289 (860-594-0338)
email: membership@arrl.org

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

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

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
- Upper Midwest Ten Meter Net: Every Thursday Evening @ 8 PM – 28.480 MHz USB
- 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



UPCOMING EVENTS

Next ARAC Board Meeting

Tuesday, April 5, 2022

@ 6:30 p.m.

Sammy's Pizza - Spirit Valley

Next ARAC Club Meeting

Thursday, April 14th

6 p.m.

Coppertop Church!

**THIS CLUB MEETING
STARTS ONE HOUR EARLY,
SO DON'T MISS IT!**

6:00 PM—Club Meeting

6:30 pm—SKYWARN
Training

*Refresh your previous Sky-
warn training if it has been 4
years or more!*

**SKYWARN TRAINING IS
OPEN TO THE PUBLIC**

**PLEASE LEAVE FRONT 2
ROWS FOR OUR GUESTS**

*Interested in providing a program,
or have an idea for one?*

Contact us at
ke0nqs.mn@gmail.com

SAVE THE DATE!

HAMFEST 2022

Used and like-new radios,
electronic equipment,
tools, vendor reps, parts, and
computer items.

License Testing On-site!

Saturday May 7, 2022

9:00AM - 1:00PM



LOOKING

for an
Amateur Radio License
TESTING SESSION?

No need to wait for a class
or Hamfest!

**Schedule your own
Testing Session TODAY!**

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

Duluth Area Repeaters



ARAC System WØGPK

Freq. Offset Tone Location

146.940	minus	103.5	Duluth
146.940	minus	107.2	Lakeside (rcv)
146.940	minus	151.4	Two Harbors (rcv)
146.940	minus	100.0	Gary-New Duluth (rcv)
146.940	minus	123.0	Solway (rcv)
146.940	minus	110.9	Cloquet (rcv)
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 (rcv for Proctor)
147.330	plus	156.7	Duluth (North) (Fish Lake)
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

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

Stand Alone Repeaters

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

Fusion and D Star

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

147.15Ø	plus	151.4	NTØB Gilbert Fusion Rptr
145.17Ø	minus	11Ø.9	WA9KLM Superior –
Douglas County RACES/ARES Fusion Repeater			
443.1ØØ	+5.ØØ	1Ø3.5	KBØYHX Cloquet –
Carlton County RACES/ARES Fusion Repeater			
444.3ØØ	+5.ØØ	1Ø3.5	NØEO Spirit Valley Amateurs Fusion
Repeater WIRES-X NØEO (Analog only) Fusion Room 40494			
147.375	plus		NØEO D Star
442.2ØØ	plus		NØEO D Star

Repeater list compiled by Dr. Frequency—KCØWDQ

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
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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.

<u>Name</u>	<u>Call</u>	<u>Expertise</u>
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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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

Co-Editors,



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

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

APRIL

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 CW 1930 AA0AW USB 2000 N0VRM ES 2100 AA0AW	4 WX 2000 KC0MKS	5 ARAC BOARD MEETING Sammy's Pizza 6:30 pm DC Net 2000 CC Net 2030	6 2100 - BWAR	7	8	9
10 CW 1930 N0PDG USB 2000 N0PDG ES 2100 KC0WDQ	11 WX 2000 KC0MKS	12 DC Net 2000 CC Net 2030	13 Lake County ARES/RACES Meeting 1800 Lake County Net 1900 2100 - BWAR	14 ARAC Club Meeting Coppertop Church 6:00 PM Skywarn 6:30	15	16
17 Happy Easter! CW 1930 AA0AW USB 2000 AA0AW ES 2100 W0NWO	18 DC ARES/RACES Mtg 1900 DC EOC WX 2000 KC0MKS	19 DC Net 2000 CC Net 2030	20 St. Louis County ARES/RACES Mtg 1630 Pike Lake EOC 2100 - BWAR	21	22	23
24 CW 1930 N0PDG USB 2000 W0LWU ES 2100 N0VRM	25 WX 2000 KC0MKS	26 DC Net 2000 CC Net 2030	27 Lake County Net 1900 2100 - BWAR	28 Carlton County ARES/RACES Meeting 1900 CC EOC	29	30 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,
April 14th, 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

Chaplains:

Visiting Chaplain:
Denny Anderson WØDIO

Parliamentarian:
Grant Forsyth KCØWUP

Website:
Thomas Dorr KEØRHA

Membership:
Bruce Carlson KEØNIT

Property Chair:
Wulf Gar WU1FGR

Testing:
Doug Nelson AAØAW

Field Day:
Dennis Anderson WØDIO

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.

FOR SALE



For Sale:
Four sections Rohn 25G tower,
plus one top section.

Included are mast and home-
brew gin pole. \$500.

Located in Warba, can be deliv-
ered to Duluth area for \$50.

Contact Jeff Bodin, WA0VOM
at jdbodin@gmail.com

Denny Burt KB0SPA has a close friend—Lynn Johnson KB9PFF of Siren, WI—who became a Silent Key. KB9PFF's radio equipment is now located in Barnum at the house of KB0SPA. Denny has difficulty hearing phone calls, so those interested in the following items, please send texts to KB0SPA at **218-341-4033**

- 1. Lafayette swr signal strength meter. 30.00**
- 2. Radio shack htx 242, 2 meter mobile 50.00**
- 3. Icom 2000 2 meter mobile.65.00**
- 4. Icom 2100 2 meter mobile 65.00**
- 5. Kenwood ts-480 hf 200 watt radio 550.00**
- 6. Palomar dx-100 hf mobile amp 3-30 MHz 50.00**
- 7. mirage 35 watt 2 meter mobile amp FM only 30.00**
- 8. Mfj 259 antenna analyzer 150.00**
- 9. Uniden bc60lt handheld scanner 20.00**
- 10. Kenwood HT-22at 60.00**
- 11. Mfj RF line insulator 25.00**
- 12. 2 tv antenna rotors 40.00 each**
- 13. 2 vintage regency crystal scanners 10.00 each**
- 14. Homemade 80 meter antenna 30.00**
- 15. 1/4 inch guy wire 80 feet. 20.00**
- 16. Stud finder 3.00**
- 17. Straight line Lazer tape 5.00**
- 18. 2 realistic speakers 5.00**
- 19. Homemade 2 meter beam 5.00**
- 20. Yaesu hf 757 gx Radio 200.00**

List Your **FOR SALE** items in the next ARAC Relay! Submit photos and descriptions to ke0nqs.mn@gmail.com

SKYWARN, continued from page 1

Skywarn Training teaches the following:

- ◆ Basics of thunderstorm development
- ◆ Fundamentals of storm structure
- ◆ Identifying potential severe weather features
- ◆ Information to report
- ◆ How to report information
- ◆ Basic severe weather safety

As noted in past Weather Issues of *The Relay*, AccuWeather meteorologist Meghan Mussoline wrote an excellent article entitled *Survival Guide: Recognize Which Clouds Mean Danger*. She says:

“During severe weather outbreaks, conditions can change rapidly and the weather can turn volatile quickly. It is crucial to follow severe weather and tornado-related watches and warnings during episodes of severe storms. Keeping a weather radio nearby, with extra batteries handy, is a must. If you are out on the open road, staying tuned to severe weather alerts and being able to read the clouds for severe weather can help save your life.”

Here’s a breakdown of ominous-looking clouds and whether there is imminent danger associated with them:

Cumulonimbus Clouds

Rapid vertical growth in these cauliflower-looking cumulonimbus clouds shows that there is a mature thunderstorm, likely producing heavy rain. Abundant moisture and instability due to cool air aloft and heating at the surface set the stage for cumulonimbus to develop.

A lifting mechanism, such as a cold front, can help trigger these clouds to form.

Heavy rain, frequent lightning, strong winds and hail can be threats associated with cumulonimbus clouds.



Scud Clouds

Scud clouds may appear to be ominous as they hang vertically below a cumulonimbus cloud. Sometimes, scud clouds are mistaken for funnel clouds.

However, these clouds are benign and non-rotating. They often have a ragged appearance that sets them apart from the usually smooth funnel clouds.



Continued on Page 17

SKYWARN, continued from page 16



Shelf Clouds

Shelf clouds often form at the leading edge of a gust front or outflow boundary from a thunderstorm or strong winds flowing down and outward from a storm.

The outer part of a shelf cloud is often smoother with a notable rising motion exhibited by a tiered look (hence, the name shelf cloud). Underneath, a turbulent, unsettled appearance is often the case.

A shelf cloud should be seen as a harbinger of strong winds, so take caution.



Continued on Page 18



Wall Clouds

A wall cloud is a cloud that is lowered from a thunderstorm, forming when rapidly rising air causes lower pressure below the storm's main updraft.

"Wall clouds can range from a fraction of a mile up to nearly 5 miles in diameter," according to the National Weather Service.

Wall clouds that rotate are a warning sign of very violent thunderstorms. They can be an indication that a tornado will touch down within minutes or even within an hour.

Funnel Clouds

A funnel cloud is a rotating column of air (visible due to condensation) that does not reach the ground.

If a funnel cloud reaches all the way to the ground, it is then classified as a tornado.

When out on the road, funnel clouds should be treated as tornadoes, since they could touch down.



Tornadoes

A tornado is a rotating column of air, reaching all the way to the ground. Strong tornadoes are one of the most destructive forces of nature on a small scale, the strongest of which can level entire towns.

A roaring noise, often compared to that of a train, can be heard in many cases when a tornado touches down.

Vehicles are **NOT** a safe place to be if there is a tornado nearby.

Continued on Page 19



Thunderstorm Anvil Clouds

Anvil clouds are the flat top of a thunderstorm, or cumulonimbus cloud.

They can spread up to "hundreds of miles downwind from the thunderstorm itself," according to the National Weather Service.

Lightning can strike from anvil clouds, even far away from a thunderstorm. Lightning described as striking "from out of the blue" is usually from an anvil cloud that has drifted from a thunderstorm.

Mammatus Clouds

Striking mammatus clouds can sometimes be seen below thunderstorm anvil clouds.

The rounded and smooth look of mammatus clouds captivates onlookers.

They are often found underneath anvil clouds of severe thunderstorms; however, they can form underneath clouds associated with non-severe thunderstorms as well.



Asperatus Clouds

An abundance of heat in the atmosphere is needed to produce enough energy for the dramatic, rolling formations of asperatus clouds. Another factor is the interaction of very moist air (often on the fringes of thunderstorm complexes) with very dry air.

The darkness of the clouds is likely due to the large amount of water vapor.

Asperatus clouds are not necessarily accompanied by stormy weather. In fact, they have often been observed without the development of thunderstorms.



Go for walks outdoors to observe our weather with "eyes to the skies". Go to the University Corporation for Atmospheric Research's **UCAR Center for Science Education** website on your phone at <https://scied.ucar.edu/learning-zone/clouds/cloud-types> for great photos and descriptions of "everyday clouds" to identify when you walk.

Don't forget to take photos of the clouds you observe & send your favorites to ke0nqs.mn@gmail.com so we can share them in next month's **Relay**. See you all at Skywarn Training on April 14th! ★



Contest Calendar - April 2022

<u>+ QRP Fox Hunt</u>	0100Z-0230Z, Apr 1
<u>+ NCCC RTTY Sprint</u>	0145Z-0215Z, Apr 1
<u>+ NCCC Sprint</u>	0230Z-0300Z, Apr 1
<u>+ K1USN Slow Speed Test</u>	2000Z-2100Z, Apr 1
<u>+ RSGB FT4 International Activity Day</u>	0800Z-2000Z, Apr 2
<u>+ PODXS 070 Club PSK 31 Flavors Contest</u>	1000Z, Apr 2 to 0400Z, Apr 3
<u>+ EA RTTY Contest</u>	1200Z, Apr 2 to 1200Z, Apr 3
<u>+ Missouri QSO Party</u>	1400Z, Apr 2 to 0400Z, Apr 3 and 1400Z-2000Z, Apr 3
<u>+ Florida State Parks on the Air</u>	1400Z-2200Z, Apr 2 and 1400Z-2200Z, Apr 3
<u>+ Mississippi QSO Party</u>	1400Z, Apr 2 to 0200Z, Apr 3
<u>+ Louisiana QSO Party</u>	1400Z, Apr 2 to 0200Z, Apr 3
<u>+ SP DX Contest</u>	Cancelled for 2022
<u>+ K1USN Slow Speed Test</u>	0000Z-0100Z, Apr 4
<u>+ OK1WC Memorial</u>	1630Z-1729Z, Apr 4
<u>+ RSGB 80m Club Championship, CW</u>	1900Z-2030Z, Apr 4
<u>+ Worldwide Sideband Activity Contest</u>	0100Z-0159Z, Apr 5
<u>+ ARS Spartan Sprint</u>	0100Z-0300Z, Apr 5
<u>+ RTTYOPS Weeksprint</u>	1700Z-1900Z, Apr 5
<u>+ Phone Weekly Test</u>	0230Z-0300Z, Apr 6
<u>+ A1Club AWT</u>	1200Z-1300Z, Apr 6
<u>+ CWops Test</u>	1300Z-1400Z, Apr 6
<u>+ Mini-Test 40</u>	1700Z-1759Z, Apr 6
<u>+ VHF-UHF FT8 Activity Contest</u>	1700Z-2000Z, Apr 6
<u>+ Mini-Test 80</u>	1800Z-1859Z, Apr 6
<u>+ CWops Test</u>	1900Z-2000Z, Apr 6
<u>+ UKEICC 80m Contest</u>	2000Z-2100Z, Apr 6
<u>+ Walk for the Bacon QRP Contest</u>	0000Z-0100Z, Apr 7 and 0200Z-0300Z, Apr 8

Continued on Page 21



Contest Calendar - April 2022, Continued

<u>+ CWops Test</u>	0300Z-0400Z, Apr 7
<u>+ CWops Test</u>	0700Z-0800Z, Apr 7
<u>+ RTTYOPS Weekspint</u>	1700Z-1900Z, Apr 7
<u>+ SARL 80m QSO Party</u>	1700Z-1900Z, Apr 7
	1800Z-1900Z, Apr 7 (CW) and 1900Z-2000Z, Apr 7 (SSB) and 2000Z-2100Z, Apr 7 (FM) and 2100Z-2200Z, Apr 7 (Dig)
<u>+ NRAU 10m Activity Contest</u>	1900Z-2100Z, Apr 7
<u>+ SKCC Sprint Europe</u>	1900Z-2000Z, Apr 7
<u>+ EACW Meeting</u>	0145Z-0215Z, Apr 8
<u>+ NCCC RTTY Sprint</u>	0230Z-0300Z, Apr 8
<u>+ NCCC Sprint</u>	2000Z-2100Z, Apr 8
<u>+ K1USN Slow Speed Test</u>	0000Z-0600Z, Apr 9
<u>+ QRP ARCI Spring QSO Party</u>	0700Z, Apr 9 to 1300Z, Apr 10
<u>+ JIDX CW Contest</u>	1200Z, Apr 9 to 1800Z, Apr 10
<u>+ IG-RY World Wide RTTY Contest</u>	1200Z-1700Z, Apr 9 (20m-10m) and 0700Z-0900Z, Apr 10 (80m) and 0900Z-1100Z, Apr 10 (40m)
<u>+ DIG QSO Party, CW</u>	1200Z, Apr 9 to 1200Z, Apr 10
<u>+ OK/OM DX Contest, SSB</u>	1200Z, Apr 9 to 1200Z, Apr 10
<u>+ FTn DX Contest</u>	1200Z, Apr 9 to 2400Z, Apr 10
<u>+ SKCC Weekend Sprintathon</u>	1300Z, Apr 9 to 0100Z, Apr 10 and 1300Z-2200Z, Apr 10
<u>+ Nebraska QSO Party</u>	1400Z, Apr 9 to 0200Z, Apr 10 and 1400Z-2000Z, Apr 10
<u>+ Texas State Parks on the Air</u>	1400Z, Apr 9 to 0200Z, Apr 10
<u>+ New Mexico QSO Party</u>	1800Z, Apr 9 to 1800Z, Apr 10
<u>+ North Dakota QSO Party</u>	

Continued on Page 22



Contest Calendar - April 2022, Continued

<u>+ Georgia QSO Party</u>	1800Z, Apr 9 to 0359Z, Apr 10 and 1400Z-2359Z, Apr 10
<u>+ Yuri Gagarin International DX Contest</u>	2100Z, Apr 9 to 2100Z, Apr 10
<u>+ International Vintage Contest HF</u>	0700Z-1100Z, Apr 10 and 1500Z-1900Z, Apr 10
<u>+ WAB 3.5/7/14 MHz Data Modes</u>	1000Z-1400Z, Apr 10 and 1700Z-2100Z, Apr 10
<u>+ Hungarian Straight Key Contest</u>	1500Z-1600Z, Apr 10
<u>+ ARRL Rookie Roundup, SSB</u>	1800Z-2359Z, Apr 10
<u>+ RSGB RoLo SSB</u>	1900Z-2030Z, Apr 10
<u>+ K1USN Slow Speed Test</u>	0000Z-0100Z, Apr 11
<u>+ 4 States QRP Group Second Sunday Sprint</u>	0000Z-0200Z, Apr 11
<u>+ OK1WC Memorial</u>	1630Z-1729Z, Apr 11
<u>+ RSGB FT4 Contest</u>	1900Z-2030Z, Apr 11
<u>+ 144 MHz Spring Sprint</u>	1900 local - 2300 local, Apr 11
<u>+ Worldwide Sideband Activity Contest</u>	0100Z-0159Z, Apr 12
<u>+ RTTYOPS Weeksprint</u>	1700Z-1900Z, Apr 12
<u>+ NAQCC CW Sprint</u>	0030Z-0230Z, Apr 13
<u>+ Phone Weekly Test</u>	0230Z-0300Z, Apr 13
<u>+ A1Club AWT</u>	1200Z-1300Z, Apr 13
<u>+ CWops Test</u>	1300Z-1400Z, Apr 13
<u>+ VHF-UHF FT8 Activity Contest</u>	1700Z-2000Z, Apr 13
<u>+ Mini-Test 40</u>	1700Z-1759Z, Apr 13
<u>+ Mini-Test 80</u>	1800Z-1859Z, Apr 13
<u>+ CWops Test</u>	1900Z-2000Z, Apr 13
<u>+ CWops Test</u>	0300Z-0400Z, Apr 14
<u>+ CWops Test</u>	0700Z-0800Z, Apr 14
<u>+ RTTYOPS Weeksprint</u>	1700Z-1900Z, Apr 14
<u>+ EACW Meeting</u>	1900Z-2000Z, Apr 14

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Contest Calendar - April 2022, Continued

<u>+ NCCC RTTY Sprint</u>	0145Z-0215Z, Apr 15
<u>+ NCCC Sprint</u>	0230Z-0300Z, Apr 15
<u>+ K1USN Slow Speed Test</u>	2000Z-2100Z, Apr 15
<u>+ Holyland DX Contest</u>	2100Z, Apr 15 to 2100Z, Apr 16 0500Z-0559Z, Apr 16 and 0600Z-0659Z, Apr 16 and 0700Z-0759Z, Apr 16 and 0800Z-0859Z, Apr 16
<u>+ ES Open HF Championship</u>	
<u>+ Worked All Provinces of China DX Contest</u>	0600Z, Apr 16 to 0559Z, Apr 17
<u>+ YU DX Contest</u>	0700Z, Apr 16 to 0659Z, Apr 17
<u>+ CQMM DX Contest</u>	0900Z, Apr 16 to 2359Z, Apr 17
<u>+ Michigan QSO Party</u>	1600Z, Apr 16 to 0400Z, Apr 17 1700Z-1800Z, Apr 16 (10m) and 1800Z-1900Z, Apr 16 (15m) and 1900Z-2000Z, Apr 16 (20m) and 2000Z-2100Z, Apr 16 (40m) and 2100Z-2300Z, Apr 16 (80m) and 0700Z-0900Z, Apr 17 (40m) and 0900Z-1000Z, Apr 17 (20m) and 1000Z-1100Z, Apr 17 (15m) and 1100Z-1200Z, Apr 17 (10m)
<u>+ EA-QRP CW Contest</u>	
<u>+ Feld Hell Sprint</u>	1800Z-2159Z, Apr 16
<u>+ Ontario QSO Party</u>	1800Z, Apr 16 to 0500Z, Apr 17 and 1200Z-1800Z, Apr 17
<u>+ Dutch PACCdigi Contest</u>	0700Z to 1900Z, Apr 17
<u>+ Quebec QSO Party</u>	1200Z-2000Z, Apr 17
<u>+ Run for the Bacon QRP Contest</u>	2300Z, Apr 17 to 0100Z, Apr 18
<u>+ K1USN Slow Speed Test</u>	0000Z-0100Z, Apr 18
<u>+ DARC Easter Contest</u>	1500Z-1730Z, Apr 18
<u>+ OK1WC Memorial</u>	1630Z-1729Z, Apr 18

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Contest Calendar - April 2022, Continued

<u>+ Worldwide Sideband Activity Contest</u>	0100Z-0159Z, Apr 19
<u>+ RTTYOPS Weeksprint</u>	1700Z-1900Z, Apr 19
<u>+ 222 MHz Spring Sprint</u>	1900 local - 2300 local, Apr 19
<u>+ Phone Weekly Test</u>	0230Z-0300Z, Apr 20
<u>+ A1Club AWT</u>	1200Z-1300Z, Apr 20
<u>+ CWops Test</u>	1300Z-1400Z, Apr 20
<u>+ VHF-UHF FT8 Activity Contest</u>	1700Z-2000Z, Apr 20
<u>+ Mini-Test 40</u>	1700Z-1759Z, Apr 20
<u>+ Mini-Test 80</u>	1800Z-1859Z, Apr 20
<u>+ CWops Test</u>	1900Z-2000Z, Apr 20
<u>+ RSGB 80m Club Championship, SSB</u>	1900Z-2030Z, Apr 20
<u>+ Walk for the Bacon QRP Contest</u>	0000Z-0100Z, Apr 21 and 0200Z-0300Z, Apr 22
<u>+ CWops Test</u>	0300Z-0400Z, Apr 21
<u>+ CWops Test</u>	0700Z-0800Z, Apr 21
<u>+ RTTYOPS Weeksprint</u>	1700Z-1900Z, Apr 21
<u>+ EACW Meeting</u>	1900Z-2000Z, Apr 21
<u>+ NTC QSO Party</u>	1900Z-2000Z, Apr 21
<u>+ NCCC RTTY Sprint</u>	0145Z-0215Z, Apr 22
<u>+ NCCC Sprint</u>	0230Z-0300Z, Apr 22
<u>+ K1USN Slow Speed Test</u>	2000Z-2100Z, Apr 22
<u>+ 10-10 Int. Spring Contest, Digital</u>	0001Z, Apr 23 to 2359Z, Apr 24
<u>+ QRP to the Field</u>	0800-1800 local, Apr 23
<u>+ SP DX RTTY Contest</u>	1200Z, Apr 23 to 1200Z, Apr 24
<u>+ Helvetia Contest</u>	1300Z, Apr 23 to 1259Z, Apr 24
<u>+ North American SSB Sprint Contest</u>	0000Z-0400Z, Apr 24
<u>+ ANZAC Day Contest</u>	1200Z, Apr 24 to 1159Z, Apr 25

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Contest Calendar - April 2022, Continued

<u>+ UA1DZ Memorial Cup</u>	1300Z-1859Z, Apr 24
<u>+ BARTG Sprint 75</u>	1700Z-2059Z, Apr 24
<u>+ K1USN Slow Speed Test</u>	0000Z-0100Z, Apr 25
<u>+ QCX Challenge</u>	1300Z-1400Z, Apr 25
<u>+ OK1WC Memorial</u>	1630Z-1729Z, Apr 25
<u>+ QCX Challenge</u>	1900Z-2000Z, Apr 25
<u>+ Worldwide Sideband Activity Contest</u>	0100Z-0159Z, Apr 26
<u>+ QCX Challenge</u>	0300Z-0400Z, Apr 26
<u>+ RTTYOPS Weeksprint</u>	1700Z-1900Z, Apr 26
<u>+ SKCC Sprint</u>	0000Z-0200Z, Apr 27
<u>+ Phone Weekly Test</u>	0230Z-0300Z, Apr 27
<u>+ A1Club AWT</u>	1200Z-1300Z, Apr 27
<u>+ CWops Test</u>	1300Z-1400Z, Apr 27
<u>+ Mini-Test 40</u>	1700Z-1759Z, Apr 27
<u>+ Mini-Test 80</u>	1800Z-1859Z, Apr 27
<u>+ CWops Test</u>	1900Z-2000Z, Apr 27
<u>+ 432 MHz Spring Sprint</u>	1900 local - 2300 local, Apr 27
<u>+ UKEICC 80m Contest</u>	2000Z-2100Z, Apr 27
<u>+ CWops Test</u>	0300Z-0400Z, Apr 28
<u>+ CWops Test</u>	0700Z-0800Z, Apr 28
<u>+ RTTYOPS Weeksprint</u>	1700Z-1900Z, Apr 28
<u>+ EACW Meeting</u>	1900Z-2000Z, Apr 28
<u>+ RSGB 80m Club Championship, Data</u>	1900Z-2030Z, Apr 28
<u>+ NCCC RTTY Sprint</u>	0145Z-0215Z, Apr 29
<u>+ NCCC Sprint</u>	0230Z-0300Z, Apr 29
<u>+ K1USN Slow Speed Test</u>	2000Z-2100Z, Apr 29

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Contest Calendar - April 2022, Continued

[+ Feld Hell Sprint](#)

[+ SBMS 2.3 GHz and Up Contest and Club Challenge](#)

[+ UK/EI DX Contest, CW](#)

[+ Russian WW MultiMode Contest](#)

[+ Florida QSO Party](#)

0000Z-2359Z, Apr 30

0600 local, Apr 30 - 2359 local,

May 1

1200Z, Apr 30 to 1200Z, May 1

1200Z, Apr 30 to 1159Z, May 1

1600Z, Apr 30 to 0159Z, May 1

& 1200Z-2159Z, May 1

Our thanks to **Bruce Horn, WA7BNM**
for use of this calendar!

Please visit Bruce's site at
www.contestcalendar.com/contestcal.html
for many other helpful contest calendar formats.

The ARAC RELAY



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