



# The RELAY)))

MARCH  
2021

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

## INDEX

Spring Equinox	1
Board Mtg Minutes	2-3
Club Mtg Minutes	4-5
Prez Sez	6
Silent Key	6
MARS Letter	7
CW Abbreviations	8
Band Plan	8
Nets	9
Upcoming Events	10
Repeaters	11
Members' Email	12
Calendar	13
Committee Chairs	14
FCC Changes Fees	15
FOR SALE	16-18
Contest Calendar	19-23

## SPRING EQUINOX IS HERE! LONGER DAYS & INCREASED PROPOGATION

The time of meteorological Spring, Vernal Equinox is upon us. Even though it really hasn't been a particularly harsh winter here in Northern Minnesota, the anticipation of Spring this year is especially contagious. Maybe the pandemic year we just had has a residual effect, but everywhere we go people are revved up & making plans to burst out into their favorite activities, including ham shack projects. I definitely am making plans to billy-goat up the slope of my roof to mount a new antenna.

So on March 20th at 4:27 a.m. here in the Northern Hemisphere, we'll cross the finish line of Winter into Spring. OK, that's pure fantasy as far as *winter weather* goes of course. I am a firm believer of keeping snow tires on until mid-May every year and more often than not we've had a few freezing rain or snow events well past May Day!

That being said, at Spring Equinox the daytime hours and nighttime hours will be approximately equal. With longer hours of sunlight comes increased propagation, as the sun increases the energy in the ionosphere. For several weeks preceding Spring, HF propagation is often noticeably better and better. Then at the equinox, solar radiation is evenly distributed in the Northern and Southern hemispheres. This makes for great DXing as bands are more likely to stay open, with increased propagation paths between the two hemispheres.

Also, watch for Aurora Borealis in the night sky during the equinox, as equinoxes are times when auroras are more likely to happen. This is because solar flares collide with nitrogen and oxygen atoms in the atmosphere, spawning auroras in the E and D layers of the atmosphere. These auroras decrease the quality of HF signals, but can increase propagation in VHF.

Since the surrounding weeks of equinoxes (both Spring & Autumn) are often marked by an increase in solar flares, "solar outages" can also occur to satellite TV services. A solar outage refers to the degradation of satellite reception due to the sun being directly behind a satellite from the perspective a receiving antenna. The sun's energy overpowers the signal being transmitted by the satellite and typically takes the link down

for a few minutes. Most satellite TV companies offer content from several different

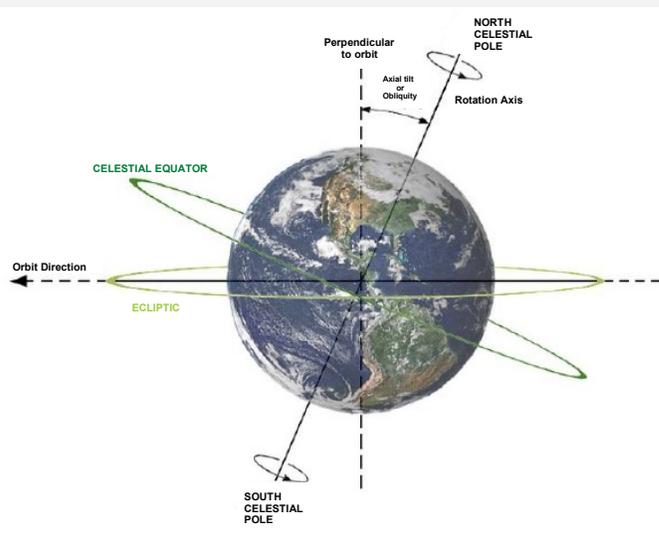


Image courtesy PerfectDuluthDay



# 2021



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facebook!

Co-Editors:

Kim & Steve Waller

Kim - KEØNQS • Steve - KEØNQT

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KEØNQT@gmail.com

Continued on page 25

# ARAC Board Meeting Minutes - February 2, 2021

## PRESIDENT



**NØVRM**  
Gene Ellefsen  
371Ø Chambersburg Ave  
Duluth, MN 55811  
218-39Ø-3272  
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## VICE PRESIDENT



**NØPDG**  
Mike Lovold  
386Ø Birchwood Rd  
Downtown Arnold, MN  
558Ø3  
lovoldm@gmail.com

## SECRETARY



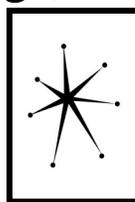
**NØCALL**  
Robin Davis  
  
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## TREASURER



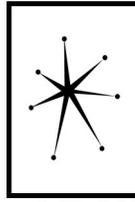
**KEØNIT**  
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9Ø6 Anderson Rd  
Duluth, MN 55811  
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## 3RD YEAR BOARD



**AAØME**  
Randy Johnson  
randy@nsw4x4.com

## 2ND YEAR BOARD



**KD9ABS**  
Gary Minter  
1621 N 26th St  
Superior WI 5488Ø

## 1ST YEAR BOARD



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

Present: Gene Ellingsen-NØVRM, Mike Lovold-NØPDG, Bruce Carlson-KEØNIT, Robin Davis, Gary Minter-KD9ABS, Randy Johnson-AAØME, Dave Davis-AAØAC, Grant Forsyth-KCØWUP, Randy Wabik-KRØB, David Pyrlik-KØDJJP, Kim Waller-KEØNQS, Steve Waller-KEØNQT, Doug-AAØAW

Meeting called to order at 6:34 pm by President Gene-NØVRM

### Minutes:

Minutes posted in newsletter and on the web site. Motion to accept by Dave-AAØAC, seconded by Gary-KD9ABS, motion passed

### Treasurer's Report:

Checking .....	2,057.79
Savings .....	2,173.73
Subtotal Cash.....	\$4,231.52

Winter CD .....	1,724.37
Summer CD .....	0.00
Subtotal CD .....	\$1,724.37

### Outstanding Checks:

Mahtowa Repeater .....	-1,100.00
Bob Boyd-KDØLYN Memorial .....	-1,020.00
First United Methodist Church (1436) ...	-150.00
Club Insurance (1437) .....	-323.00
Reserved Funds .....	-\$2,270.00

Grand Total .....	\$3,362.29
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People are paying their dues, some for two (2) years. We are also receiving some donations to the Club.

Annual Sam's Club Membership renewal was paid for by Bruce-KEØNIT. Not much happening. Storage Unit fee? Due in October now. Pay for twelve (12) months and they give us an extra month of rental at no charge. Any other questions? Not a lot of expenses because we are not holding in person meetings. In good shape to cover the expenses for the Ham Fest. If we hold it, we will have money to spend. Motion to approve by Randy-AAØME, seconded by Gary-KD9ABS, motion passed

David Pyrlik-KØDJJP here as he would like to assist with the Repeaters. A warm welcome from the Board and a big yes for the future assistance

### Committee Reports:

#### Ham Fest

ARRL has sanctioned our Ham Fest. Bob Schultz-KCØNFB also received a gift certificate for the Fest. What are the parameters over at the Fairgrounds? We don't know yet. Dayton Ham Fest has been cancelled. There is a possibility we will not be holding our own Ham Fest. Biggest determining factor will be what WI allows for the size of a gathering. Gene-NØVRM will be talking to John Cavanaugh-KCØAFE about Plan B, possibly using the Four Seasons in the fall. Mid-Winter Madness has been cancelled. Sounds like

*Continued on Page 3*

# ARAC Board Meeting Minutes , continued

## **Continued from page 2**

Brainerd will be cancelling their Ham Fest as well. We will have to wait and see. Hope for the best. Better to plan for it and have to cancel it. What about the \$100.00 deposit that was year to year? Bob-KC0NFB had nothing to report to Gene-N0VRM. Doug-AA0AW is going to call Pat Ryan as she is still part of the Fair Board and was involved when the Club paid the \$100.00 deposit fee that rolled forward year to year to try to get some information about getting our deposit refunded to the Club

### Education:

Tech class has ten (10) or eleven (11) people. General class has started with a few participants as well

### Programs:

Mike-N0PDG deserves accolades for the great Zoom programs over the last few months. He discovered he likes the Zoom meeting, which he didn't think he would like. It is fun. Pat Hayden-KC0JRJ has a customer whose son, Gunner, is fired up about getting his Ham License. Keep their information because they attended the Zoom meetings

### Repeater:

Nothing to report. Pursue the grant idea. We can't go forward without obtaining a grant. Follow up on Media Com's abandoned coax. The coax could have been stripped off the tower during inspections for wind load, etc. Common to strip off the coax and the antennas that have been abandoned. Rex said to use his name in talking with WDSE.

### Grants:

Costed out the items, broken into three (3) phases. We need to identify whom the target person or group that has funds available. Enbridge, MN Power, Husky Refinery, etc. are a possible source for grants to the Club. They all have a Community Fund that has a grant. Kim-KE0NQS need a list of the different things that ARAC does to serve the community, such as Public Safety, ARES/RCES, National Weather Service, Grandma's, all the races. Put together with pictures what we do for the community as part of the grant application. We also need to find out if anyone has a connection to the organizations we will be approaching. It helps to have someone bring the information inside the organization, maybe even to present it. Northern Communities Credit Union also has a donation fund for the Community and Grant-KCOWUP know the Executive Director because he hired her. Everything helps. Write down all the activities we have done as ARAC. We put together a short presentation to include with a request. There are generally time lines for grant distribution. MN Common Grant Form usually has a date attached to the distribution. We could find out the organizations who still have funds to give this year. Kim-KE0QNS will continue to work on this project. She is asking members to write down the various activities, looking to the Board members first. Gene-N0VRM volunteered to start writing some information

### Testing:

We had two (2) test sessions with one (1) candidate. We're going to wait for additional interest in testing before scheduling another test session. The Tech/General class ends May 20, 2021, with a Test Session. We have the ability to test one on one if requested

### **New Business:**

#### Grandma's Marathon:

They will be holding Grandma's Marathon this year, in a modified format. All three (3) races filled quickly with 4,000 runners in each of the main races and 1,500 runners for the 5K. They have hired a gentleman from Europe to provide the restricted marathon program. Plans are for an hour worth of staggered start times. Scott Ahlgren-N0BYU and Doug-AA0AW will be circulating information about providing communication at the Aid Stations along with the live onsite road communication. Doug-AA0AW feels the motorcycles will play a very important role in the race this year. We don't know what the Aids Stations will look like at this time. Scott-N0BYU, Doug-AA0AW and Jeff Nast-KC0MKS did meet with the staff at the office but there will be more information provided, as we get closer to the actual race. There will be a need for amateur communications during the Race again this year. One a side note - most of their donations go to the Youth portion of the race community

Motion to adjourn by Bruce-KE0NIT, Gary-KD9ABS seconded, motion passed at 7:04 pm





# ARAC Club Meeting Minutes

February 11, 2021

**Present:**

President Gene Ellefsen-N0VRM  
Vice President Mike Lovold-N0PDG  
Treasurer / Membership Bruce Carlson-KE0NIT  
Secretary Robin Davis  
First Year Board Dave Davis-AA0AC  
Second Year Board Gary Minter-KD9ABS  
Special Events – Open / Gene Ellefsen-N0VRM acting  
Ham Fest / Education Bob Schultz-KC0NFB  
Testing Doug Nelson-AA0AW

**Absent:**

Third Year Board Randy Johnson-AA0ME  
Chaplain (Visiting) Rolland Bockbrader-KB0CK  
Parliamentarian Grant Forsyth-KC0WUP  
Property / Picnic Scott Ahlgren-N0BYU  
Newsletter / Historian Kim Waller-KE0NQS  
Newsletter Steve Waller-KE0NQY  
Repeater Randy Wabik-KR0B  
Repeater Derek McCorison-W0DNF  
Repeater Randy Haglin-N0BZZ  
Web Site Thomas Dorr-KE0RHA

Meeting called to order by President Gene-N0VRM at 7:00 pm via 94 Repeater. Thanks everybody for doing the meeting on the air. COVID is making things a little difficult

**Minutes:**

Minutes posted in newsletter and on the web site. Any questions about the minutes? Any objections to passing the minutes? We approved the minutes

**Treasurer's Report:**

Checking .....	2,057.79
Savings .....	2,173.73
Subtotal Cash .....	\$4,231.52
Winter CD .....	1,724.37
Summer CD .....	0.00
Subtotal CD .....	\$1,724.37
Assets Subtotal: .....	\$5,955.89
Outstanding Checks:	
Mahtowa Repeater .....	-1,100.00
Bob Boyd-KD0LYN Memorial .....	-1,020.00
First United Methodist Church (1436) .....	-150.00
Club Insurance (1437) .....	-323.00
Reserved Funds .....	-\$2,270.00
Grand Total .....	\$3,362.29

Any questions regarding the report? Make a motion to approve by Jeff Nast-KC0MKS, seconded by Mike-N0PDG. Thank you. Any objections? Motion is approved

**Committee Reports:**

Education:

Current info for Tech class with twelve (12) students, graduating just before the Ham Fest. Thank you, Bob-KC0NFB, sounds like it is going really well

*Continued on Page 5*



## ARAC Club Meeting Minutes, *continued*

### Testing:

Next testing session is April 20, 2021. We haven't scheduled anything in between as Doug-AA0AW hasn't received any emails or calls. Last two (2) sessions, nobody showed up for testing. Adequately handled for now. If you are thinking you want to upgrade, the fee is increasing soon per the ARRL

### Ham Fest:

Currently we have fifteen (15) tables reserved, the site is reserved and it is ARRL approved. If we can't hold the Ham Fest, we will look at the Fall Fest in conjunction with their group

### Repeater:

Randy Wabik-KR0B has done a plan to upgrade the 94 Repeater in three (3) phases. I forgot the sheet but I'll share it next month. Third phase is the big one, feed line and the antenna. Phased because of our Club finances. Thank you for getting your dues in early. It is greatly appreciated. With COVID, there is a damper on our finances. Everybody's dues are greatly appreciated – can't thank everybody enough. We will have to follow the guidelines. Going forward and if we have to cancel, we will be able to cancel it. We have Plan B as an option. We won't put money over health

Question from Mitch Wiss-WA9TRY. Damage to the antenna, how long ago? Why replace it? Repeater is forty (40) years old. Assumption that is still original equipment on the tower. The antenna was changed out six (6) or seven (7) years ago. Cost us close to \$4,000.00. 1990 or 1991 there was some work done. It is a half-inch hard line going up to the antenna at 500 feet. 1988 that hard line was put up, which is 33 or 34 years old. Hard line does not last forever. Does that answer your question, Mitch-WA9TRY? Yes it does

### Field Day:

The ARRL has posted information for Field Day 2021. They are not encouraging gatherings but to operate from home. They put a power limit on the home usage. Interesting like last year

### Grandma's Marathon:

Grandma's will be held with half of the people, 4,000 for full and 4,000 for half and 1,500 for the 5K. Medical meeting was held with Jeff-KC0MKS, Scott-N0BYU and I (Doug-AA0AW). There is a lot of stuff still to be tied up. Consider helping out with Aid Station Communications. We will be still isolating during to Covid. More information will be coming in April and in May. Start checking out your handhelds and batteries, antennas, etc. We won't have to scramble for Grandma's. We are always looking for new volunteers and we put experienced operators with new people

Anything else to bring up for discussion before we break up?

From Bob-N0PDG Program is Tom Ferguson-WB0DHB talking about the power grid via Zoom. He is a retired engineer from MN Power and he was also teaching at UMD. He is a great speaker and he will do an excellent job. Bill Mitchell-AE0EE, ARRL Section Manager and Holly Cox-K0HAC, Affiliated Club Coordinator will be presenting the program in March

Bob-KC0NFB motion to adjourn and point of order. Bob-KC0NFB will provide the link to the Zoom meeting, so email his call sign to join. Seconded by Jeff-KC0MKS, anybody disapprove? Hearing none, adjourning at 7:23 pm



## Prez Sez...

Hi everyone!

Just a reminder that the March A.R.A.C club meeting will be on the 94 repeater Thursday March 11 at 7:00 PM followed by a Zoom program. The program will feature Bill Mitchell AEØEE, the ARRL Minnesota Section Manager and a guest.

If you are planning to upgrade your license or get a vanity call sign you may want to do it soon, as the FCC is proposing to set a fee of \$35.00 to do these items. When you are ready for testing contact Doug Nelson AAØAW at [aa0aw@chartermi.net](mailto:aa0aw@chartermi.net) and he will set up a testing session.

We are also looking for net control operators for both the 10 meter SSB net and the Southern St.Louis County Emergency Services Net (94 repeater) on Sunday nights. If you are interested contact me for more information.

73 Gene Ellefsen NØVRM

## Silent Key



On Thursday morning February 25th, 2021 **Jim Dall WDØGVW** became a Silent Key. Please keep Teresa KAØCDO and her family in your prayers!





## 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](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](mailto:wb7dru@gmail.com)

AFA5ZV Randy, KRØB [afa5zv@gmail.com](mailto:afa5zv@gmail.com)

AFA5JY Reg, KAØRJY [reg\\_cass@msn.com](mailto: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	■■■■●■■■■●
L	■■■■●●●	X	■■■■●●●■	0	■■■■■■■■



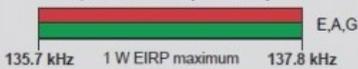
## US Amateur Radio Bands

### US AMATEUR POWER LIMITS

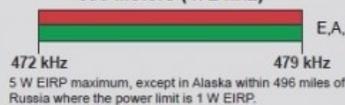
FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

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.

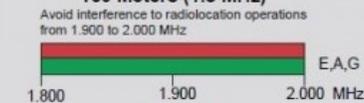
#### 2,200 Meters (135 kHz)



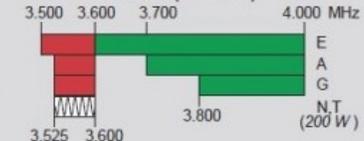
#### 630 Meters (472 kHz)



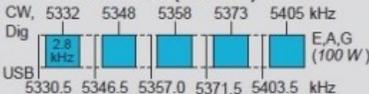
#### 160 Meters (1.8 MHz)



#### 80 Meters (3.5 MHz)

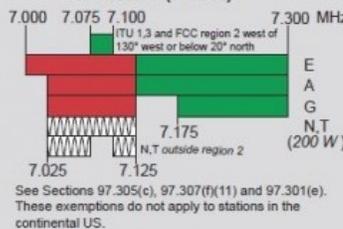


#### 60 Meters (5.3 MHz)

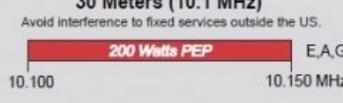


General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated power (ERP) of 100 W PEP relative to a half-wave dipole. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such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

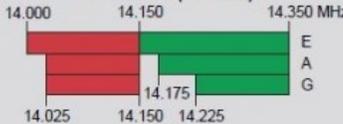
#### 40 Meters (7 MHz)



#### 30 Meters (10.1 MHz)



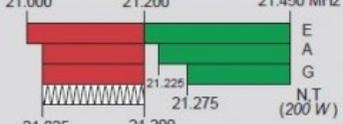
#### 20 Meters (14 MHz)



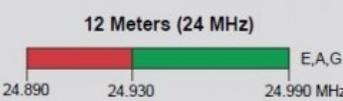
#### 17 Meters (18 MHz)



#### 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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email: [nowham@arrl.org](mailto:nowham@arrl.org)

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

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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

# 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](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](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



## Next ARAC Board Meeting

Tuesday, March 2, 2021

@ 6:30 p.m.

Sammy's Pizza

### Next ARAC Club Meeting

Thursday,  
March 11, 2021  
7 p.m.

on the 94 Repeater

Join us on Zoom immediately  
following the club meeting!

March 11th Zoom  
PROGRAM

Bill Mitchell AEØEE

ARRL Minnesota Section Manager  
and a guest

*You do not need a Zoom account to  
participate!*

NEXT MONTH'S ZOOM TOPIC:  
SKYWARN

*Interested in providing a pro-  
gram, or have an idea for one?*

Contact Mike NØPDG at  
[lovoldm@gmail.com](mailto:lovoldm@gmail.com)

### Amateur Radio License Testing Sessions!

Tuesday April 20, 2021  
3 p.m. & 5:30 p.m.

House of Refuge  
115 W Myrtle St, Duluth

- ◆ Please contact Doug Nelson AA0AW at [aa0aw@arrl.net](mailto:aa0aw@arrl.net) to sign up for your test session time if possible
- ◆ Walk-ins always welcome, with no prior reservation!

Cost: \$15

General License Class via Zoom!  
IN PROCESS

January 20th—March 31st

This 12-week course is held  
Wednesdays at 19:00 CST

Lead Instructor:  
Diane Saunders KØDSL

Associate Instructors:  
Bob Schulz KCØNFB  
Paul Dallavia KCØWDQ

To visit this FREE class in process, please contact KØDSL at [k0dslae@gmail.com](mailto:k0dslae@gmail.com)

#### Class Text

2019-2023 *General Class* book by Gordon West WB6NOA, available from Amazon at \$24.95.

#### Highly Recommended (optional) Additional Material

ARRL publication *Understanding Basic Electronics, 2nd Edition*, available from ARRL at \$32.95.

#### Equipment

Handheld calculator without programming functions or capability (scientific calculator is recommended--- such as the Texas Instruments TI-30XIIS Scientific Calculator, white, available from Amazon for \$15).

**This class is available to anyone anywhere. All that is needed is a desire to obtain an upgrade from Technician to General Class. Any additional questions, please contact KØDSL at [kc0dslae@gmail.com](mailto:kc0dslae@gmail.com)**

Upon completing this class, individuals in the Twin Ports region can seek testing by contacting Doug Nelson AAØAW at [aa0aw@arrl.net](mailto:aa0aw@arrl.net) All others, please contact your local club or go to <http://www.arrl.org/find-an-amateur-radio-license-exam-session> to find an exam near you.

# Duluth Area Repeaters



## ARAC System WØGKP

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
-------	-------------	-------	-------------

Sunday Nights at 193Ø on 28.125 MHz

### Northland Weather Group Net Control Roster

KCØMKS Jeff Nast

Monday Nights at 2ØØØ on the ARAC System

### Douglas County Net

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

### Central Carlton County Net

Tuesday Nights at 2Ø3Ø on the ARAC System

### Lake County RACES/ARES Net

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

# Elmers

El-mer / el-mær/ [el-mer]

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

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

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

Co-Editors,  
Kim & Steve Waller  
KEØNQS & KEØNQT



**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

# MARCH

## 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  WX 2000 KCØMKS	2 <b>ARAC BOARD MEETING - 18:30</b> Sammy's Pizza  DC Net 2000 CC Net 2030	3	4	5	6
7  CW 1930 AAØAW USB 2000 K9KDK ES 2100 AAØAW	8  DC ARES/ RACES Mtg 1900 DC EOC  WX 2000 KCØMKS	9  DC Net 2000 CC Net 2030	10  Lake County ARES/RACES Meeting 1800 Lake County Net 1900 2100 -BWAR	11  <b>ARAC Club Meeting</b> <b>94 Repeater</b> <b>7 pm</b>	12	13
14  CW 1930 NØPDG USB 2000 ES 2100 KCØWDQ	15  WX 2000 KCØMKS	16  DC Net 2000 CC Net 2030	17  St. Louis County ARES/ RACES Mtg 1630 Pike Lake EOC 2100 -BWAR	18	19	20
21  CW 1930 AAØAW USB 2000 NØVRM ES 2100 WØNWO	22  WX 2000 KCØMKS	23  DC Net 2000 CC Net 2030	24  Lake County Net 1900 2100 -BWAR	25  Carlton County ARES/RACES Meeting 1900 CC EOC	26	27  Club Breakfast @ The Chalet 0800-0900
28  CW 1930 NØPDG USB 2000 NØPDG ES 2100 NØVRM						

Get this newsletter *faster*  
via email!  
Email Doug AAØAW at  
[aa0aw@arrl.net](mailto:aa0aw@arrl.net)

Next Meeting: Thursday,  
March 11, 20201 - 7 pm  
On the 94 Repeater

## 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](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).



# FOR SALE



Our thanks to the family of Bob Boyd KDØYLN, who have graciously donated Bob's ham shack equipment to the ARAC.

Bob became a silent key on May 31, 2020 & was serving the club as a 1st Year Board Member. N0PDG found sales for 3 items totaling \$970 thus far.

The Board has voted to earmark all proceeds from Bob's equipment toward replacement of our aging repeater.

## THE FOLLOWING ITEMS ARE AVAILABLE FOR SALE:

We are taking offers on non-priced items & will present offers for discussion on all items for consideration as appropriate. Contact N0PDG at [lovoldm@gmail.com](mailto:lovoldm@gmail.com) to make offer.

**YAESU 767GX**, built in power supply. Comes with matching speaker (no cables to hook up the speaker). This radio has an issue with all the lights coming on all the time. Sometimes they come on, sometimes not.

**MAKE OFFER**

**KENWOOD TS-940S** Receives Great! No mic, built in power supply, power button missing. Unit powers up by pushing the display button, likely had work done to it. Unknown on power output.

**MAKE OFFER**

**ICOM 718 RADIO** with mic and power cord. No manual. New are selling for \$625.

**ASKING \$400**

**Morse code book with a cd for learning. Also oscillator, no keyer.**

**ASKING \$20**

**ICOM IC-Z1A Handheld dual band.** Comes with manual. Unknown if works as there is no power cord or charger. Worked fine when gifted to Bob by Randy Johnson AA0ME.

**MAKE OFFER**

**ADDITIONAL ITEMS FOR SALE ON PAGES 17 & 18!**

# FOR SALE



Larry Mattfield KEØPJW, of Bovey, Minnesota became a silent key July 25, 2020. NØVRM was contacted by Minton Miller NØNWO who is handling the sale of the radio equipment benefiting Larry's wife of 48 years, Betsy.

Please contact Minton Miller NØNWO at [mdfamily@mchsi.com](mailto:mdfamily@mchsi.com) or 218-256-6708 with questions or offers on the following items:

Icom 7300 \$935.00

Icom sm30 desk mic \$119

Samlex sec1235m \$110.50

LDG AT 600 Prow II auto tuner for Icom \$ 314.50

Yaesu 857d hf/vhf/uhf \$680

Yaesu ft70d 2m ht \$148.75

Yaesu SBH-28 rapid charger \$25.50

Yaesu SBR-24Li batteries (2X) \$34 each or \$68 for both.

MFJ 941E manual antenna tuner \$119

Ameritron ALS 500m mobile 500 watt amp \$850

Ameritron ALS 500 rc mobile amp remote \$55.25

Ameritron SPS 75MV switching power supply \$246.50

vantage pro 2 weather station. \$990.25

diamond 2m/440 X50A bass antenna \$80.75

Solarcon A 99 cb antenna with GPK-1 Ground Plane \$123.25

Alpha Delta DELTA 4b coax switch. \$89.25

**MORE ITEMS  
FOR SALE on p.18!**

# FOR SALE

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.

For those interested in the following items, please send texts to KB0SPA  
at **218-341-4033**

1. a pair of uniden frs or gmrs radios, with cradle charger 20.00
- 2.lafayette swr field strength meter. with box. 30.00
- 3.radio shack 2 meter mobile radio model htx-242 60.00
4. ic-2000 2 meter mobile lcom, 65.00
- 5.ic-2100 2 meter mobile icom 65.00
- 6.Yaesu 2800 2 meter mobile 65.00
7. yaesu 2900 2 meter mobile 75.00
8. Kenwood ts-480 200 watt radio hf-6 meters. 500.00
- 9.palamar tx-100 3-30 mhz mobile hf amp 50.00
10. hygain 2.5 amp power supply 15.00
11. yaesu 757gx hf radio 200.00
12. astron ss-25m with meters built in, 45.00
- 13.kenwood at-200 tuner. 60.00
14. astron rs-20a power supply. 65.00
15. mirage 35 watt 2 meter fm amp 30.00
- 16.uniden 40 channel cb radio 10.00
17. sears roadtalker base mic 30.00
18. realistic pro 2023 scanner 10.00
19. mfj 259 analyzer 150.00
20. mfj 862 144/220/440 swr watt meter.25.00
- 21.realistic 2024 scanner 10.00
22. bc60xlt handheld scanner x2 of these 20.00 a peace.
- 23.tv antenna rotor with 3 wire wire. 35.00
24. realistic pro 2003 scanner. 15.00
25. 2 vintage regency scanners crystal operated. 10.00 each.
26. auto rotator tra rotor with control box 45.00
27. lil tarheel screwdriver 225.00
28. 50 feet raw coax on a spool 10.00
29. 1/4 inch guy wire cable 80-100 feet. 20.00

# Contest Calendar - March 2021

<a href="#"><u>+ K1USN Slow Speed Test</u></a>	0000Z-0100Z, Mar 1
<a href="#"><u>+ OK1WC Memorial</u></a>	1630Z-1729Z, Mar 1
<a href="#"><u>+ RSGB 80m Club Championship, Data</u></a>	2000Z-2130Z, Mar 1
<a href="#"><u>+ Worldwide Sideband Activity Contest</u></a>	0100Z-0159Z, Mar 2
<a href="#"><u>+ ARS Spartan Sprint</u></a>	0200Z-0400Z, Mar 2
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Mar 2
<a href="#"><u>+ AGCW YL-CW Party</u></a>	1900Z-2100Z, Mar 2
<a href="#"><u>+ QRP Fox Hunt</u></a>	0200Z-0330Z, Mar 3
<a href="#"><u>+ Phone Weekly Test - Fray</u></a>	0230Z-0300Z, Mar 3
<a href="#"><u>+ CWops Mini-CWT Test</u></a>	1300Z-1400Z, Mar 3
<a href="#"><u>+ VHF-UHF FT8 Activity Contest</u></a>	1700Z-2000Z, Mar 3
<a href="#"><u>+ CWops Mini-CWT Test</u></a>	1900Z-2000Z, Mar 3
<a href="#"><u>+ UKEICC 80m Contest</u></a>	2000Z-2100Z, Mar 3
<a href="#"><u>+ CWops Mini-CWT Test</u></a>	0300Z-0400Z, Mar 4
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Mar 4
<a href="#"><u>+ NRAU 10m Activity Contest</u></a>	1800Z-1900Z, Mar 4 (CW) and 1900Z-2000Z, Mar 4 (SSB) and 2000Z-2100Z, Mar 4 (FM) and 2100Z-2200Z, Mar 4 (Dig)
<a href="#"><u>+ SKCC Sprint Europe</u></a>	2000Z-2200Z, Mar 4
<a href="#"><u>+ NCCC RTTY Sprint</u></a>	0145Z-0215Z, Mar 5
<a href="#"><u>+ QRP Fox Hunt</u></a>	0200Z-0330Z, Mar 5
<a href="#"><u>+ NCCC Sprint</u></a>	0230Z-0300Z, Mar 5
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	2000Z-2100Z, Mar 5
<a href="#"><u>+ Novice Rig Roundup</u></a>	0000Z, Mar 6 to 2359Z, Mar 14
<a href="#"><u>+ ARRL Inter. DX Contest, SSB</u></a>	0000Z, Mar 6 to 2400Z, Mar 7

*Continued on Page 20*

## Contest Calendar - March 2021, Continued

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

[+ Open Ukraine RTTY Championship](#)

[+ UBA Spring Contest, CW](#)

[+ NSARA Contest](#)

[+ SARL Hamnet 40m Simulated Emerg Contest](#)

[+ WAB 3.5 MHz Phone](#)

[+ K1USN Slow Speed Test](#)

[+ OK1WC Memorial](#)

[+ Worldwide Sideband Activity Contest](#)

[+ RTTYOPS Weeksprint](#)

[+ QRP Fox Hunt](#)

[+ Phone Weekly Test - Fray](#)

[+ CWops Mini-CWT Test](#)

[+ VHF-UHF FT8 Activity Contest](#)

[+ CWops Mini-CWT Test](#)

[+ RSGB 80m Club Championship, CW](#)

[+ AWA John Rollins Memorial DX Contest](#)

[+ CWops Mini-CWT Test](#)

[+ RTTYOPS Weeksprint](#)

[+ NCCC RTTY Sprint](#)

0600Z-0629Z, Mar 6 and

0630Z-0659Z, Mar 6 and

0700Z-0729Z, Mar 6 and

0730Z-0800Z, Mar 6

1800Z-2059Z, Mar 6 (Low Band)

2100Z-2359Z, Mar 6 (Low Band)

0800Z-1059Z, Mar 7 (High Band)

1100Z-1359Z, Mar 7 (High Band)

0700Z-1100Z, Mar 7

1200Z-1600Z, Mar 7 and

1800Z-2200Z, Mar 7

1200Z-1400Z, Mar 7

1800Z-2200Z, Mar 7

0000Z-0100Z, Mar 8

1630Z-1729Z, Mar 8

0100Z-0159Z, Mar 9

1700Z-1900Z, Mar 9

0200Z-0330Z, Mar 10

0230Z-0300Z, Mar 10

1300Z-1400Z, Mar 10

1700Z-2000Z, Mar 10

1900Z-2000Z, Mar 10

2000Z-2130Z, Mar 10

2300Z, Mar 10 to 2300Z, Mar 11

2300Z, Mar 13 to 2300Z, Mar 14

0300Z-0400Z, Mar 11

1700Z-1900Z, Mar 11

0145Z-0215Z, Mar 12

*Continued on Page 21*

## Contest Calendar - March 2021, Continued

<a href="#"><u>+ QRP Fox Hunt</u></a>	0200Z-0330Z, Mar 12
<a href="#"><u>+ NCCC Sprint</u></a>	0230Z-0300Z, Mar 12
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	2000Z-2100Z, Mar 12
<a href="#"><u>+ YB DX RTTY Contest</u></a>	0000Z-2359Z, Mar 13
	0500Z-0700Z, Mar 13 (6m) and
	0700Z-0900Z, Mar 13 (2m) and
	0900Z-1100Z, Mar 13 (70cm) and
<a href="#"><u>+ SARL VHF/UHF Analogue Contest</u></a>	0500Z-0700Z, Mar 14 (6m) and
	0700Z-0900Z, Mar 14 (2m) and
	0900Z-1100Z, Mar 14 (70cm)
<a href="#"><u>+ SARL Field Day Contest</u></a>	0800Z, Mar 13 to 0800Z, Mar 14
<a href="#"><u>+ RSGB Commonwealth</u></a>	1000Z, Mar 13 to 1000Z, Mar 14
	1200Z-1700Z, Mar 13 (20m-10m)
<a href="#"><u>+ DIG QSO Party, SSB</u></a>	0700Z-0900Z, Mar 14 (80m) and
	0900Z-1100Z, Mar 14 (40m)
<a href="#"><u>+ South America 10 Meter Contest</u></a>	1200Z, Mar 13 to 1200Z, Mar 14
<a href="#"><u>+ SKCC Weekend Sprintathon</u></a>	1200Z, Mar 13 to 2400Z, Mar 14
<a href="#"><u>+ F9AA Cup, SSB</u></a>	1200Z, Mar 13 to 1200Z, Mar 14
	1400Z, Mar 13 to 0200Z, Mar 14
<a href="#"><u>+ Oklahoma QSO Party</u></a>	1500Z-2200Z, Mar 14
<a href="#"><u>+ AGCW QRP Contest</u></a>	1400Z-2000Z, Mar 13
<a href="#"><u>+ Stew Perry Topband Challenge</u></a>	1500Z, Mar 13 to 1500Z, Mar 14
<a href="#"><u>+ EA PSK63 Contest</u></a>	1600Z, Mar 13 to 1600Z, Mar 14
<a href="#"><u>+ TESLA Memorial HF CW Contest</u></a>	1800Z, Mar 13 to 0559Z, Mar 14
<a href="#"><u>+ QCWA QSO Party</u></a>	1800Z, Mar 13 to 1800Z, Mar 14
<a href="#"><u>+ Idaho QSO Party</u></a>	1900Z, Mar 13 to 1900Z, Mar 14
<a href="#"><u>+ QRP ARCI Spring Thaw SSB Shootout</u></a>	2200Z-2300Z, Mar 13
<a href="#"><u>+ North American Sprint, RTTY</u></a>	2300Z, Mar 13 to 0300Z, Mar 14

*Continued on Page 22*

## Contest Calendar - March 2021, Continued

<a href="#"><u>+ UBA Spring Contest, 2m</u></a>	0700Z-1100Z, Mar 14
<a href="#"><u>+ Classic Exchange, Phone</u></a>	1400Z, Mar 14 to 0800Z, Mar 15 1400Z, Mar 16 to 0800Z, Mar 17
<a href="#"><u>+ Wisconsin QSO Party</u></a>	1800Z, Mar 14 to 0100Z, Mar 15
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	0000Z-0100Z, Mar 15
<a href="#"><u>+ 4 States QRP Group Second Sunday Sprint</u></a>	0000Z-0200Z, Mar 15
<a href="#"><u>+ OK1WC Memorial</u></a>	1630Z-1729Z, Mar 15
<a href="#"><u>+ Bucharest Digital Contest</u></a>	1800Z-2059Z, Mar 15
<a href="#"><u>+ RSGB FT4 Contest Series</u></a>	2000Z-2130Z, Mar 15
<a href="#"><u>+ Worldwide Sideband Activity Contest</u></a>	0100Z-0159Z, Mar 16
<a href="#"><u>+ CLARA Chatter Party</u></a>	1700Z, Mar 16 to 1700Z, Mar 17 1700Z, Mar 20 to 1700Z, Mar 21
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Mar 16
<a href="#"><u>+ QRP Fox Hunt</u></a>	0100Z-0230Z, Mar 17
<a href="#"><u>+ Phone Weekly Test - Fray</u></a>	0230Z-0300Z, Mar 17
<a href="#"><u>+ CWops Mini-CWT Test</u></a>	1300Z-1400Z, Mar 17
<a href="#"><u>+ CWops Mini-CWT Test</u></a>	1900Z-2000Z, Mar 17
<a href="#"><u>+ NAQCC CW Sprint</u></a>	0030Z-0230Z, Mar 18
<a href="#"><u>+ CWops Mini-CWT Test</u></a>	0300Z-0400Z, Mar 18
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Mar 18
<a href="#"><u>+ BCC QSO Party</u></a>	1930Z-2059Z, Mar 18
<a href="#"><u>+ QRP Fox Hunt</u></a>	0100Z-0230Z, Mar 19
<a href="#"><u>+ NCCC RTTY Sprint</u></a>	0145Z-0215Z, Mar 19
<a href="#"><u>+ NCCC Sprint</u></a>	0230Z-0300Z, Mar 19
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	2000Z-2100Z, Mar 19
<a href="#"><u>+ BARTG HF RTTY Contest</u></a>	0200Z, Mar 20 to 0159Z, Mar 22
<a href="#"><u>+ Russian DX Contest</u></a>	1200Z, Mar 20 to 1200Z, Mar 21
<a href="#"><u>+ AGCW VHF/UHF Contest</u></a>	1400Z-1700Z, Mar 20 (144) and 1700Z-1800Z, Mar 20 (432)

Continued on Page 23

## Contest Calendar - March 2021, Continued

<a href="#"><u>+ Virginia QSO Party</u></a>	1400Z, Mar 20 to 0400Z, Mar 21
	1200Z-2400Z, Mar 21
<a href="#"><u>+ Feld Hell Sprint</u></a>	2000Z-2159Z, Mar 20
<a href="#"><u>+ UBA Spring Contest, SSB</u></a>	0700Z-1100Z, Mar 21
<a href="#"><u>+ Run for the Bacon QRP Contest</u></a>	2300Z, Mar 21 to 0100Z, Mar 22
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	0000Z-0100Z, Mar 22
<a href="#"><u>+ OK1WC Memorial</u></a>	1630Z-1729Z, Mar 22
<a href="#"><u>+ Worldwide Sideband Activity Contest</u></a>	0100Z-0159Z, Mar 23
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Mar 23
<a href="#"><u>+ SKCC Sprint</u></a>	0000Z-0200Z, Mar 24
<a href="#"><u>+ QRP Fox Hunt</u></a>	0100Z-0230Z, Mar 24
<a href="#"><u>+ Phone Weekly Test - Fray</u></a>	0230Z-0300Z, Mar 24
<a href="#"><u>+ CWops Mini-CWT Test</u></a>	1300Z-1400Z, Mar 24
<a href="#"><u>+ CWops Mini-CWT Test</u></a>	1900Z-2000Z, Mar 24
<a href="#"><u>+ CWops Mini-CWT Test</u></a>	0300Z-0400Z, Mar 25
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Mar 25
<a href="#"><u>+ RSGB 80m Club Championship, SSB</u></a>	2000Z-2130Z, Mar 25
<a href="#"><u>+ QRP Fox Hunt</u></a>	0100Z-0230Z, Mar 26
<a href="#"><u>+ NCCC RTTY Sprint</u></a>	0145Z-0215Z, Mar 26
<a href="#"><u>+ NCCC Sprint</u></a>	0230Z-0300Z, Mar 26
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	2000Z-2100Z, Mar 26
<a href="#"><u>+ FOC QSO Party</u></a>	0000Z-2359Z, Mar 27
<a href="#"><u>+ CQ WW WPX Contest, SSB</u></a>	0000Z, Mar 27 to 2359Z, Mar 28
<a href="#"><u>+ UBA Spring Contest, 6m</u></a>	0600Z-1000Z, Mar 28
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	0000Z-0100Z, Mar 29
<a href="#"><u>+ QCX Challenge</u></a>	1300Z-1400Z, Mar 29
<a href="#"><u>+ OK1WC Memorial</u></a>	1630Z-1729Z, Mar 29
<a href="#"><u>+ QCX Challenge</u></a>	1900Z-2000Z, Mar 29

## Contest Calendar - March 2021, Continued

<a href="#">+ Worldwide Sideband Activity Contest</a>	0100Z-0159Z, Mar 30
<a href="#">+ QCX Challenge</a>	0300Z-0400Z, Mar 30
<a href="#">+ RTTYOPS Weeksprint</a>	1700Z-1900Z, Mar 30
<a href="#">+ QRP Fox Hunt</a>	0100Z-0230Z, Mar 31
<a href="#">+ Phone Weekly Test - Fray</a>	0230Z-0300Z, Mar 31
<a href="#">+ CWops Mini-CWT Test</a>	1300Z-1400Z, Mar 31
<a href="#">+ CWops Mini-CWT Test</a>	1900Z-2000Z, Mar 31
<a href="#">+ UKEICC 80m Contest</a>	2000Z-2100Z, Mar 31

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

Please visit Bruce's site at  
[www.contestcalendar.com/contestcal.html](http://www.contestcalendar.com/contestcal.html)

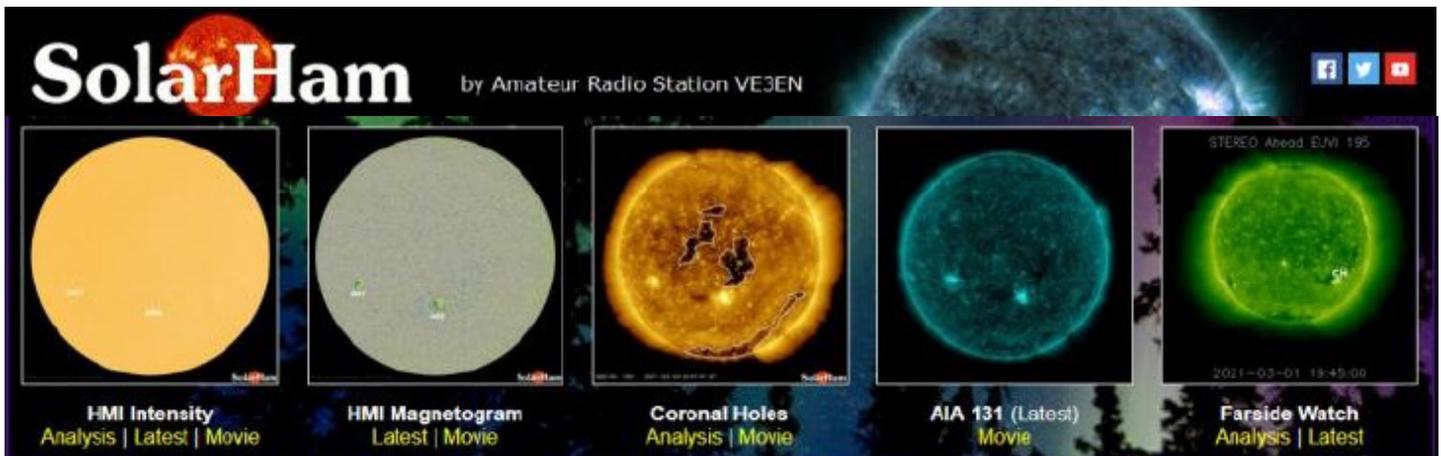
IN THE IMAGE BELOW, CAN YOU FIND:  
7 Lucky 4-leaf clovers & 12 Lucky gold INDIVIDUAL (not in a pile) coins?



satellites, so during this process various channels of your service could go out at different times around equinox time. Though irritating, the service interruption is usually for a short period of time and then resumes normal operation.

To see all kinds of reports and forecasting tools on solar activity, one site I like is Solar Ham, assembled and run by amateur radio station VE3EN. Visit [www.SolarHam.net](http://www.SolarHam.net) to see great info on solar indices, geomagnetic field and aurora forecasts, solar flare detection and threats, and real-time solar winds, to name a few.

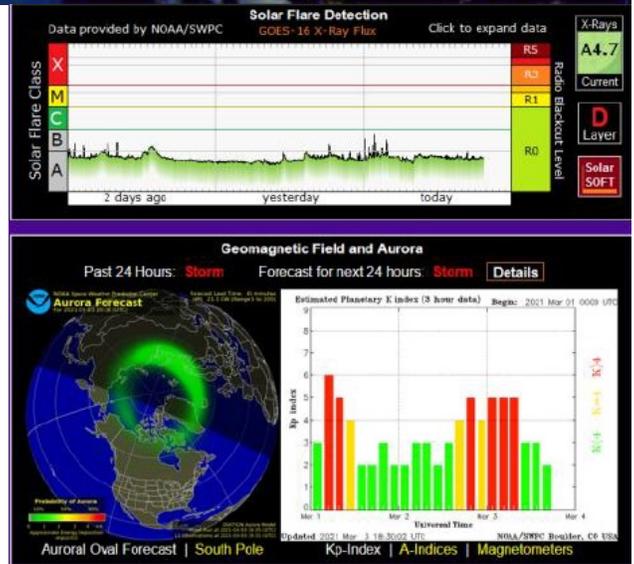
Though a little blurry, I'll share some screenshots below to give you a sneak peek:



With all this increased propagation talk, it makes me think of the movie *Frequency* starring Dennis Quaid and Jim Caviezel. Have you ever seen it? This is a story about a fictionalized wild propagation phenomenon on ham radio during massive solar storms, that changed the course of a small town's history. If you can suspend your *disbelief* in the depiction of ham radio piercing the limits of space/time, it is quite an excellent action/thriller. I'm thinking that I'll look it up to see it again this weekend.

Yep—I just looked it up now, while you blinked. Amazon Prime has it to rent as a streaming movie for \$2.99 or you can buy a new DVD from them for \$12.99. Well worth it either way.

Do you have a great equinox propagation story to tell us about or an account of aurora activity you've witnessed? Let us know your story by emailing us at [ke0nqs.mn@gmail.com](mailto:ke0nqs.mn@gmail.com) and we'll share it in the next issue of *The Relay*. ★



## The ARAC RELAY



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