



# The RELAY)))

OCTOBER  
2022



The Official Publication of the Arrowhead Radio Amateur Club

A.R.A.C. Inc.

P.O. Box 7164 Duluth MN 55807-7164

<http://www.thearac.org>

Dues: Member \$20/Family \$25

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## Artemis Rocket Safe from Hurricane

### NASA Plans New Launch Window in November

Last month, NASA was forced yet again to scrub the launch the Artemis 1 moon rocket. Artemis 1 is the first spacecraft in the new Artemis program of missions, as well as the first flight of NASA's Space Launch System (SLS) rocket series and the Orion Spacecraft. This month's Relay will give just a very brief update:

Hurricane Ian hit south-west Florida and was downgraded to tropical storm by the time its center of rotation passed directly over Kennedy Space Center, which experienced heavy rain and wind, but endured with only a few minor water intrusions according to NASA.



NASA's Space Launch System moon rocket rolls into High Bay 3 of the Vehicle Assembly Building on Sept. 27 to take shelter from Hurricane Ian. Photo Credit: NASA/Joel Kowsky

The Artemis 1 moon rocket had been moved to safe shelter in the Vehicle Assembly hangar and suffered no

damage. Bob Cabana, NASA's Associate Administrator says, "Fortunately, it was down to about 55-knot winds when it hit us, and we had some flooding and stuff, but overall we're looking good. And it was really good that we got that big rocket back in the barn. Ian tracked right between pad 39A and B as it went across, and it was great knowing that SLS and Orion were safe..."

SpaceflightNow.com reports: "NASA hauled the 322-foot-tall (98-meter) moon rocket rocket off Launch Complex 39B and back to the VAB early Tuesday, September 27<sup>th</sup>, before weather conditions deteriorated at Kennedy. It was the sixth time the SLS moon rocket has moved between the VAB and the launch pad since March, and engineers prefer to minimize the moves to limit wear and tear on the rocket from the vibrations of riding on top of the crawler. But in the end, NASA decided it was more risky

Continued on Page 13

The Relay Co-Editors:  
Kim & Steve Waller

Kim - KEØNQS      Steve - KEØNQT  
[KEØNQS.mh@gmail.com](mailto:KEØNQS.mh@gmail.com)      [KEØNQT@gmail.com](mailto:KEØNQT@gmail.com)



# AUTUMN 2022



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ARAC Official Website <http://www.thearac.org> 1

# ARAC Board Meeting - September 6, 2022

## PRESIDENT



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

## VICE PRESIDENT



**KØDJP**  
David Pyrlík  
  
david.pyrlík@gmail.com

## SECRETARY



**KFØGJW**  
Melinda Nelson

## TREASURER



**KNØNUL**  
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



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

## 1ST YEAR BOARD



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

## Current Board Members

Gene Ellefsen – NØVRM, Bruce Carlson – KNØNUL,  
Gary Minter – KD9ABS, Melinda Nelson – KFØGJW,  
Dave Pyrlík – KØDJP, Dave Davis – AAØAC

## Minutes:

No Minutes are available for this meeting as Melinda was unavailable. Treasurer Bruce Carlson KNØNUL submitted the following report:

## August 2022 Treasurer's Report

for presentation at September 2022 Club Meeting

Checking \$ 885.79  
Savings \$ 2,374.63  
Repeater \$ 4,666.67

Subtotal Cash \$7,927.09

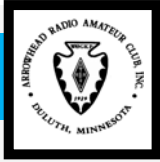
Winter CD \$ 1,730.42  
Summer CD 0.00  
Subtotal CDs \$1,730.42  
Assets Subtotal: \$9,657.51

Minus Checks Outstanding

Checks Subtotal: - \$0.00

Grand Total \$ 9,657.51

*Submitted by ARAC Treasurer Bruce Carlson – KNØNUL*



# ARAC Club Meeting Minutes

**September 8, 2022**

No September Club Meeting Minutes were submitted, however Treasurer Bruce Carlson KN0NUL presented the following report:

## **August 2022 Treasurer's Report**

for presentation at September 2022 club meeting

Checking \$ 885.79  
Savings \$ 2,374.63  
Repeater \$ 4,666.67

Subtotal Cash \$7,927.09

Winter CD \$ 1,730.42  
Summer CD 0.00  
Subtotal CDs \$1,730.42  
Assets Subtotal: \$9,657.51

Minus Checks Outstanding

Checks Subtotal: - \$0.00

Grand Total \$ 9,657.51

In addition, the September Minutes will be presented at the October 13th Club Meeting as follows:

## **September 2022 Treasurer's Report**

for presentation at October 2022 club meeting

Checking \$ 892.19  
Savings \$ 2,374.93  
Repeater \$ 4,667.26

Subtotal Cash \$7,934.38

Winter CD \$ 1,730.42  
Summer CD 0.00  
Subtotal CDs \$1,730.42  
Assets Subtotal: \$9,664.80

Minus Checks Outstanding

Checks Subtotal: - \$0.00

Grand Total \$ 9,664.80



## Pres Sez...

Hi everyone!

Fall is in the air, summer is over, and that means it is time for nominations for the ARAC Board. The positions open are President, Vice President, Secretary, Treasurer, and First Year Board Member. Nominations will be accepted at the October and November Club meetings with nominations closed at the end of the November meeting. If you would like to nominate someone or would like to run for one of the positions yourself you can do that at the meetings or let one of the current Board Members know.

Also, we could use some more Net Control Operators for the Sunday night 2 meter net and the 10 meter SSB net. If you are interested, let me or one of the other Net Control Operators know and we can give the details about it.

This October, our Club Meeting on the 13th will **not** conflict with the Copertop Church's Annual Roast Beef Dinner. The date of the Dinner is Thursday, October 6 from 4:30 to 6:30 and is drive through pickup only. Cost is \$12.00 The official menu is Roast Beef, Mashed Potatoes & Gravy, Corn, Coleslaw, Dinner Roll and Homemade Apple Crisp!!!

73

Gene Ellefsen NØVRM

**CLUB REPEATER**

**WØGKP**

**146.94 (-)**

**CTCSS TONE**

**103.5**



# Calling All Hams...

Dear Arrowhead Radio Amateurs Club,

The Salvation Army North Division is in the process of expanding The Salvation Army Team Emergency Radio Network (SATERN) membership in Minnesota & North Dakota.

SATERN volunteers are Emergency Disaster Services members that provide The Salvation Army with auxiliary & emergency radio communications, along with technical support, during disasters and special events. Members volunteer under the direction of a Salvation Army staff member or a staff appointed volunteer leader with experience. Members are required to be current on all of The Salvation Army training requirements.

Volunteers play a crucial role in disaster response efforts by offering basic needs to those who may have lost everything. To learn more about what The Salvation Army does during a disaster response, [click here - https://disaster.salvationarmyusa.org/aboutus/?ourservices](https://disaster.salvationarmyusa.org/aboutus/?ourservices)

The first step in becoming a disaster worker with The Salvation Army's Emergency Disaster Services program is to create an online profile and complete a simple application. Go to <https://disaster.salvationarmyusa.org/volunteer/new/> in order to begin that process. After you have completed the online application, your information will be shared with your local Salvation Army.

If you have any questions, please contact [satern.north@gmail.com](mailto:satern.north@gmail.com)

We look forward to volunteering with you!

73,

Dean Blosberg, NØHOY  
SATERN Coordinator  
The Salvation Army  
Central Territory  
North Division



# 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

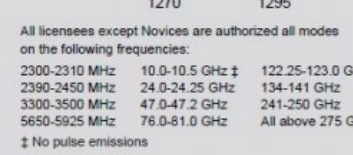
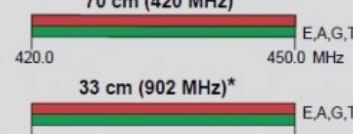
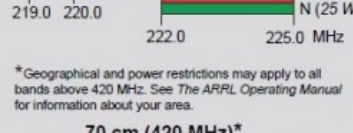
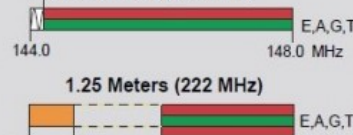
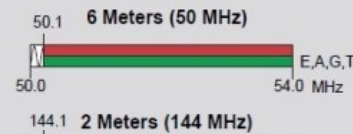
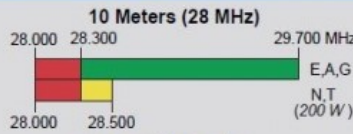
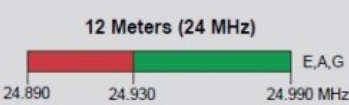
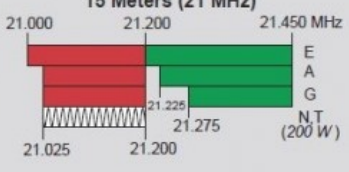
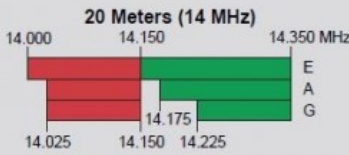
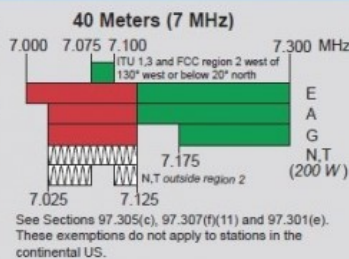
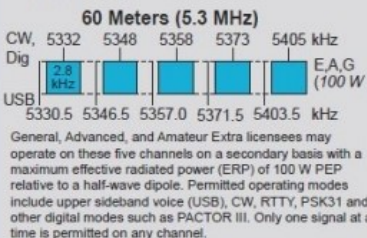
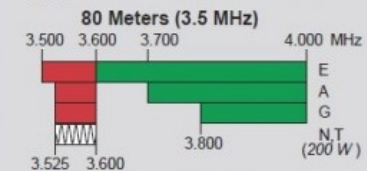
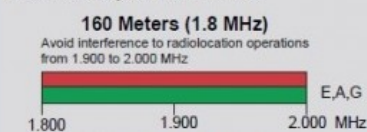
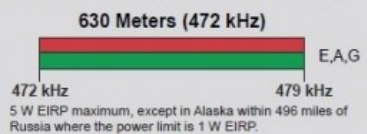
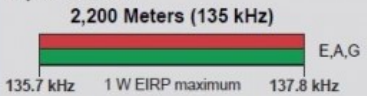
FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

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



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



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

### ARRL We're At Your Service

ARRL Headquarters:  
860-594-0200 (Fax 860-594-0259)  
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email: [orders@arrl.org](mailto:orders@arrl.org)

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email: [membership@arrl.org](mailto:membership@arrl.org)

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

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



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

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





# UPCOMING EVENTS

## Next ARAC Board Meeting

Tuesday, October 4, 2022  
@ 6:30 p.m.

Sammy's Pizza - Spirit Valley

## Next ARAC Club Meeting

Thursday, October 13th  
7 p.m.  
Coppertop Church!



First United Methodist Church

230 E Skyline Pkwy,  
Duluth, MN 55811



## HAPPY HARVEST



## LOOKING for an Amateur Radio License TESTING SESSION?

**Schedule your own Testing Session TODAY!**

**Contact Doug Nelson-AA0AW at [aa0aw@arrl.net](mailto:aa0aw@arrl.net) or 218-391-5874**

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

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

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

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





# DULUTH AREA REPEATERS

## ARAC System WØGKP

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

## N9MMU/N9QWH System (WI)

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

## WECOMM – WI Statewide Linked System WE9COM

147.075	plus	110.9	Meteor Hill (closest repeater to Duluth)
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## LSAC System #1

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

## NARC System NAØRC

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

## Stand Alone Repeaters

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

## Fusion

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

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

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

## Fusion continued

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

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

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

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

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

## D Star

147.375	plus	NØEO D Star
442.200	plus	NØEO D Star

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

## ST. Louis County Department of Emergency Services Net Control Roster

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

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

## Ten Meter SSB Net Control Roster

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

**Sunday Nights at 2ØØØ on 28.45Ø MHz USB**

## Ten Meter CW Net Control Roster

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

**Sunday Nights at 193Ø on 28.125 MHz**

## Northland Weather Group Net Control Roster

KCØMKS Jeff Nast

**Monday Nights at 2ØØØ on the ARAC System**

## Douglas County Net

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

## Central Carlton County Net

**Tuesday Nights at 2Ø3Ø on the ARAC System**

## Lake County RACES/ARES Net

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

# Elmers

## El-mer / el-mør / [el-mer]

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

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

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

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



# OCTOBER

## CLUB EVENTS

### 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

### 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  CW 1930 AA0AW USB 2000 N0PDG ES 2100 KC0WDQ	3  WX 2000 KC0MKS	4  ARAC BOARD MEETING Sammy's Pizza 6:30 pm  DC Net 2000 CC Net 2030	5  2100 - BWAR	6	7	8
9  CW 1930 N0PDG USB 2000 AA0AW ES 2100 W0NWO	10  DC ARES/ RACES Mtg 1900 DC EOC  WX 2000 KC0MKS	11  DC Net 2000 CC Net 2030	12  Lake County ARES/RACES Meeting 1800 Lake County Net 1900 2100 - BWAR	13  ARAC Club Meeting Coppertop Church 7:00 PM	14	15
16  CW 1930 AA0AW USB 2000 W0LWU ES 2100 N0VRM	17  WX 2000 KC0MKS	18  DC Net 2000 CC Net 2030	19  St Louis County ARES/RACES Meeting 1800 2100 - BWAR	20	21	22
23  CW 1930 N0PDG USB 2000 K9KDK ES 2100 N9DMG	24	25  DC Net 2000 CC Net 2030	26  Lake County Net 1900 2100 - BWAR	27  Carlton County ARES/RACES Meeting 1900 CC EOC	28	29  ARAC Club Breakfast  The Chalet 4833 Miller Trunk Hwy Hermantown, MN 8 AM
30  CW 1930 AA0AW USB 2000 N0VRM ES 2100 AA0AW	31  Hallowe'en					

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

Next Meeting: Thursday,  
*October 13th, 2022 - 7 pm*  
at the Coppertop Church!

## ARAC Committee Chairs



**Club License Trustee:**

Ray Barnes KEØZN

**Control Operators:**

AAØAW - NØKXT - KCØNFB

**Newsletter/Historian:**

Kim KEØNQS & Steve KEØNQT  
Waller

**Education Chair:**

Bob Schulz KCØNFB

**Hamfest Chair:**

Bob Schulz KCØNFB

**Chaplain:**

Rollie Bockbader KBØCK

**Visiting Chaplain:**

**Parliamentarian:**

Grant Forsyth KCØWUP

**Website:**

Thomas Dorr KEØRHA

**Membership:**

Bruce Carlson KEØNIT

**Property Chair:**

Scott Ahlgren NØVYU

**Testing:**

Doug Nelson AAØAW

**Field Day:**

**Picnic Chair:**

Scott Ahlgren, NØVYU

**Repeater Chairs:**

Randy Haglin NØBZZ  
Randy Wabik KAØJZV

**Contest Calendar** at [www.contestcalendar.com](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).



# Artemis Rocket, continued from page 1

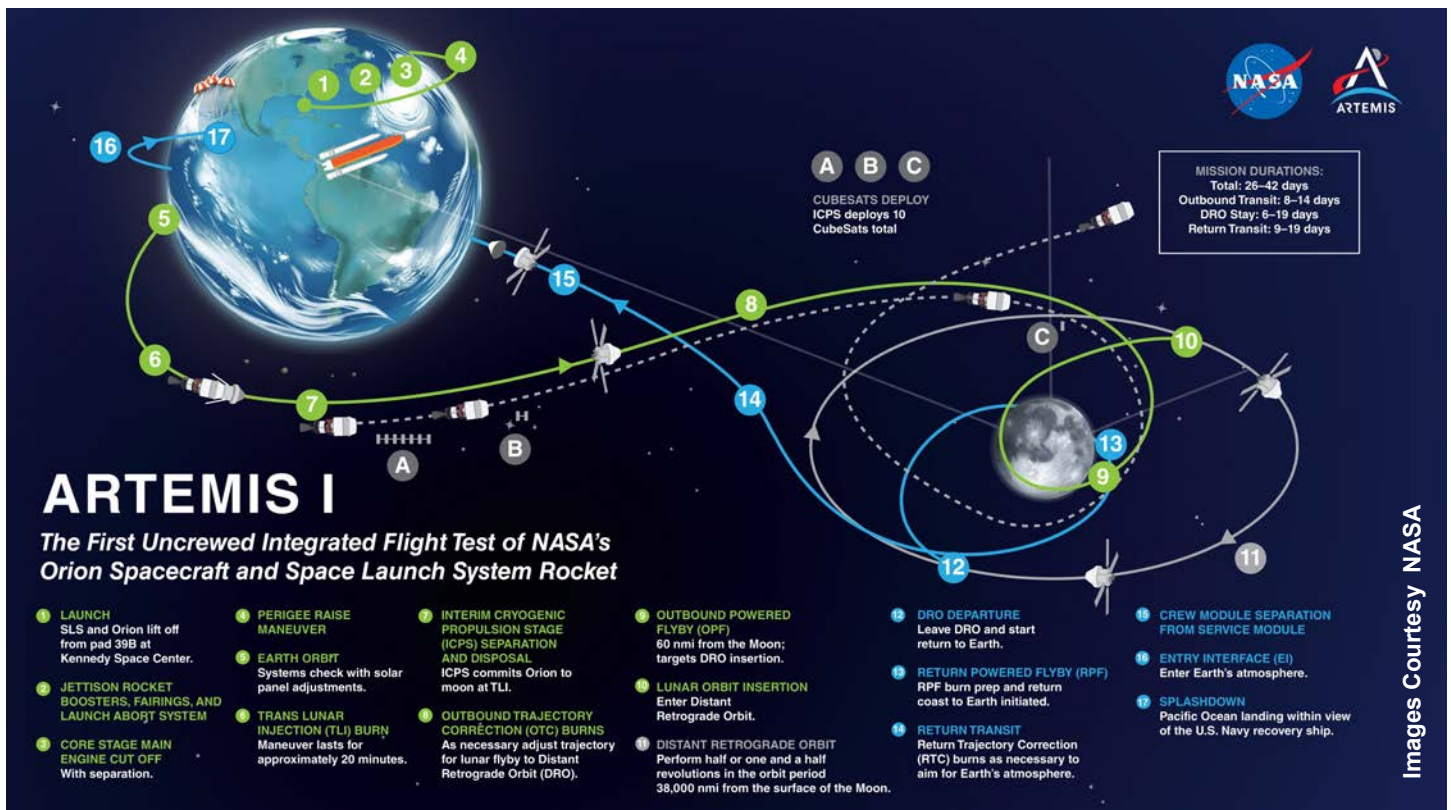
to leave the rocket on the pad with tropical storm or hurricane force winds possible at Kennedy Space Center this week.”

NASA staff are now busy installing access platforms around the SLS moon rocket and Orion spacecraft inside High Bay 3 of the hangar so that specialty teams can perform detailed inspections and prepare for the next launch attempt window in November. See the launch window summary below from Spaceflight Now and stay tuned to NASA.com for all the latest updates along the way.

SPACEFLIGHT NOW		Date	Time	Duration
<b>Launch Times for Artemis 1 Launch Period 28</b> 	Nov. 12	11:55 p.m. EST (0455 GMT)	24 minutes	
	Nov. 14	12:04 a.m. EST (0504 GMT)	69 minutes	
	Nov. 15	12:20 a.m. EST (0520 GMT)	112 minutes	
	Nov. 16	1:04 a.m. EST (0604 GMT)	120 minutes	
	Nov. 17	1:04 a.m. EST (0604 GMT)	120 minutes	
	Nov. 18	1:11 a.m. EST (0611 GMT)	120 minutes	
	Nov. 19	1:45 a.m. EST (0645 GMT)	120 minutes	
	Nov. 22	7:06 a.m. EST (1106 GMT)	120 minutes	
	Nov. 23	7:34 a.m. EST (1134 GMT)	120 minutes	
	Nov. 24	9:02 a.m. EST (1402 GMT)	120 minutes	
	Nov. 25	10:10 a.m. EST (1510 GMT)	111 minutes	
	Nov. 27	12:36 p.m. EST (1736 GMT)	4 minutes	

Image Credit: Spaceflight Now

For detail about how the **Artemis 1** mission is connected with amateur radio and the **Omotenashi CubeSat** launch, read last month's *Relay* cover story called *Amateur Radio on the Moon: Ham Radio Transmitter Aboard New Moon Lander*. We also love the great rendering, below, that breaks down 14 phases of the mission from start to finish. Here's hoping we'll have more mission news to share with you in a couple of months! ★



When the **Artemis 1 Mission** does successfully launch, it will last six weeks and is designed to test all the rocket stages and spacecraft that will be used in later Artemis missions. After reaching orbit and performing a trans-lunar injection (burn to the Moon), the Artemis 1 mission will deploy ten CubeSat satellites and the Orion spacecraft will enter a distant retrograde orbit for six days. The Orion spacecraft will then return and reenter the Earth's atmosphere, protected by its heat shield, and splash down in the Pacific Ocean.



**FOR SALE**

**Entire Lot of Items - \$25**



- **Two Drills**  
One still holds a charge, with charger
- **Two vintage Crystal Regency scanners**
- **One analog Uniden scanner**

**Contact:**

**Denny KBOSPA**

If interested, please **TEXT ONLY** at **218-341-4033**

# FOR SALE

**I am selling equipment for another Ham. All items are as is. Please send me an email with your interest and/or Best offer.**

**For more information, please send all inquiries to [kc0wdq@gmail.com](mailto:kc0wdq@gmail.com)**

**Kenwood TS-440S 10m-160m HF with Internal AT and CW and SSB Filters with Kenwood PS-50 \$ 450**

**Kenwood TS-430S 10m-160m HF with Kenwood PS-430 \$ 400**

**FT-60R 2/440 HT Needs new batteries has drop in charger \$ 75**

**Kantronics KPC-3 TNC \$ 60**

**Radio Shack SWR-Power Meter 21-534 \$ 20**

**J-com Magic Notch \$ 30**

**Midland CB Radio 77-882 \$ 20**

**Marine Radio – Presidents P580 \$ 30**

**Buxcomm Rascal for Packet \$ 30**

**Tiny Track with Garmin E Map GPS for APRS \$ 40**

**Pace 3 position Coax Switch Model 5621 \$ 40**

**White Fiberglass Masting with Pins approximately 30 feet – Interlocking \$ 100**

**Used Easy –up 3 foot Tripod \$50**

**Hitch mount for masting - 2” square tubing with a Swivel Trailer Jack for attaching masting off of vehicle – extends about 3 feet away from vehicle \$ 75**

**Radio Shack CB Antenna Mount 3/8” to SO-239 210-0961 Original Packaging \$ 10**

**Radio Shack Solder-type PL-259 for RG-8 279-0205 original packaging \$ 8**

**Radio Shack Solderless PL-259 for RG-58 278-196 original packaging \$ 5**

**Radio Shack 36” Mobile Scanner Antenna – 25-1300MHz 200-0032 in original packaging \$ 30**

**I am selling:**

**Kenwood TS-180S Receive only – No Transmit – Final Transistors no longer work or for parts \$ 165 with matching Kenwood PS-30 \$ 50**

**Please contact [kc0wdq@gmail.com](mailto:kc0wdq@gmail.com)**



# Contest Calendar - October 2022

<a href="#"><u>+ Collegiate QSO Party</u></a>	0000Z, Oct 1 to 2359Z, Oct 2
<a href="#"><u>+ Oceania DX Contest, Phone</u></a>	0600Z, Oct 1 to 0600Z, Oct 2
<a href="#"><u>+ Worked All Provinces of China DX Contest</u></a>	0600Z, Oct 1 to 0559Z, Oct 2
<a href="#"><u>+ TRC DX Contest</u></a>	Cancelled for 2022
<a href="#"><u>+ Russian WW Digital Contest</u></a>	1200Z, Oct 1 to 1159Z, Oct 2
<a href="#"><u>+ IARU Region 1 UHF/Microwaves Contest</u></a>	1400Z, Oct 1 to 1400Z, Oct 2
<a href="#"><u>+ EU Sprint, SSB</u></a>	1500Z-1859Z, Oct 1
<a href="#"><u>+ International HELL-Contest</u></a>	1600Z-1800Z, Oct 1 (80m) and 0900Z-1100Z, Oct 2 (40m)
<a href="#"><u>+ California QSO Party</u></a>	1600Z, Oct 1 to 2200Z, Oct 2
<a href="#"><u>+ SKCC QSO Party</u></a>	1800Z, Oct 1 to 1800Z, Oct 2
<a href="#"><u>+ RSGB DX Contest</u></a>	0600Z-1800Z, Oct 2
<a href="#"><u>+ UBA ON Contest, SSB</u></a>	0600Z-0900Z, Oct 2
<a href="#"><u>+ Peanut Power QRP Sprint</u></a>	2200Z-2359Z, Oct 2
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	0000Z-0100Z, Oct 3
<a href="#"><u>+ German Telegraphy Contest</u></a>	0700Z-1000Z, Oct 3
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1300Z-1400Z, Oct 3
<a href="#"><u>+ OK1WC Memorial</u></a>	1630Z-1729Z, Oct 3
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1900Z-2000Z, Oct 3
<a href="#"><u>+ RSGB 80m Autumn Series, CW</u></a>	1900Z-2030Z, Oct 3
<a href="#"><u>+ ARS Spartan Sprint</u></a>	0100Z-0300Z, Oct 4
<a href="#"><u>+ Worldwide Sideband Activity Contest</u></a>	0100Z-0159Z, Oct 4
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	0300Z-0400Z, Oct 4
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Oct 4
<a href="#"><u>+ Phone Weekly Test</u></a>	0230Z-0300Z, Oct 5
<a href="#"><u>+ A1Club AWT</u></a>	1200Z-1300Z, Oct 5
<a href="#"><u>+ CWops Test</u></a>	1300Z-1400Z, Oct 5
<a href="#"><u>+ Mini-Test 40</u></a>	1700Z-1759Z, Oct 5
<a href="#"><u>+ VHF-UHF FT8 Activity Contest</u></a>	1700Z-2100Z, Oct 5

Continued on Page 20





## Contest Calendar - October 2022, Continued

<a href="#">+ <u>Mini-Test 80</u></a>	1800Z-1859Z, Oct 5
<a href="#">+ <u>CWops Test</u></a>	1900Z-2000Z, Oct 5
<a href="#">+ <u>432 MHz Fall Sprint</u></a>	1900 local - 2300 local, Oct 5
<a href="#">+ <u>UKEICC 80m Contest</u></a>	2000Z-2100Z, Oct 5
<a href="#">+ <u>Walk for the Bacon QRP Contest</u></a>	0000Z-0100Z, Oct 6 and 0200Z-0300Z, Oct 7
<a href="#">+ <u>CWops Test</u></a>	0300Z-0400Z, Oct 6
<a href="#">+ <u>CWops Test</u></a>	0700Z-0800Z, Oct 6
<a href="#">+ <u>RTTYOPS Weekspint</u></a>	1700Z-1900Z, Oct 6
<a href="#">+ <u>NRAU 10m Activity Contest</u></a>	1700Z-1800Z, Oct 6 (CW) and 1800Z-1900Z, Oct 6 (SSB) and 1900Z-2000Z, Oct 6 (FM) and 2000Z-2100Z, Oct 6 (Dig)
<a href="#">+ <u>SARL 80m QSO Party</u></a>	1700Z-2000Z, Oct 6
<a href="#">+ <u>SKCC Sprint Europe</u></a>	1900Z-2100Z, Oct 6
<a href="#">+ <u>NCCC RTTY Sprint</u></a>	0145Z-0215Z, Oct 7
<a href="#">+ <u>NCCC Sprint Ladder</u></a>	0230Z-0300Z, Oct 7
<a href="#">+ <u>K1USN Slow Speed Test</u></a>	2000Z-2100Z, Oct 7
<a href="#">+ <u>Makrothen RTTY Contest</u></a>	0000Z-0800Z, Oct 8 and 1600Z-2400Z, Oct 8 and 0800Z-1600Z, Oct 9
<a href="#">+ <u>QRP ARCI Fall QSO Party</u></a>	0000Z-2359Z, Oct 8
<a href="#">+ <u>Nevada QSO Party</u></a>	0300Z, Oct 8 to 2100Z, Oct 9
<a href="#">+ <u>Oceania DX Contest, CW</u></a>	0600Z, Oct 8 to 0600Z, Oct 9
<a href="#">+ <u>Microwave Fall Sprint</u></a>	0800 local - 1400 local, Oct 8
<a href="#">+ <u>SKCC Weekend Sprintathon</u></a>	1200Z, Oct 8 to 2400Z, Oct 9
<a href="#">+ <u>Scandinavian Activity Contest, SSB</u></a>	Cancelled for 2022
<a href="#">+ <u>Arizona QSO Party</u></a>	1500Z, Oct 8 to 0500Z, Oct 9
<a href="#">+ <u>Pennsylvania QSO Party</u></a>	1600Z, Oct 8 to 0400Z, Oct 9 and 1300Z-2200Z, Oct 9

*Continued on Page 21*



## Contest Calendar - October 2022, Continued

<a href="#"><u>+ South Dakota QSO Party</u></a>	1800Z, Oct 8 to 1800Z, Oct 9
<a href="#"><u>+ PODXS 070 Club 160m Great Pumpkin Sprint</u></a>	2000Z, Oct 8 to 2000Z, Oct 9
<a href="#"><u>+ UBA ON Contest, CW</u></a>	0600Z-0900Z, Oct 9
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	0000Z-0100Z, Oct 10
<a href="#"><u>+ 4 States QRP Group Second Sunday Sprint</u></a>	0000Z-0200Z, Oct 10
<a href="#"><u>+ 10-10 Int. 10-10 Day Sprint</u></a>	0001Z-2359Z, Oct 10
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1300Z-1400Z, Oct 10
<a href="#"><u>+ OK1WC Memorial</u></a>	1630Z-1729Z, Oct 10
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1900Z-2000Z, Oct 10
<a href="#"><u>+ Worldwide Sideband Activity Contest</u></a>	0100Z-0159Z, Oct 11
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	0300Z-0400Z, Oct 11
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Oct 11
<a href="#"><u>+ NAQCC CW Sprint</u></a>	0030Z-0230Z, Oct 12
<a href="#"><u>+ Phone Weekly Test</u></a>	0230Z-0300Z, Oct 12
<a href="#"><u>+ A1Club AWT</u></a>	1200Z-1300Z, Oct 12
<a href="#"><u>+ CWops Test</u></a>	1300Z-1400Z, Oct 12
<a href="#"><u>+ VHF-UHF FT8 Activity Contest</u></a>	1700Z-2100Z, Oct 12
<a href="#"><u>+ Mini-Test 40</u></a>	1700Z-1759Z, Oct 12
<a href="#"><u>+ Mini-Test 80</u></a>	1800Z-1859Z, Oct 12
<a href="#"><u>+ CWops Test</u></a>	1900Z-2000Z, Oct 12
<a href="#"><u>+ RSGB 80m Autumn Series, Data</u></a>	1900Z-2030Z, Oct 12
<a href="#"><u>+ CWops Test</u></a>	0300Z-0400Z, Oct 13
<a href="#"><u>+ CWops Test</u></a>	0700Z-0800Z, Oct 13
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Oct 13
<a href="#"><u>+ EACW Meeting</u></a>	1900Z-2000Z, Oct 13
<a href="#"><u>+ NCCC RTTY Sprint</u></a>	0145Z-0215Z, Oct 14
<a href="#"><u>+ NCCC Sprint</u></a>	0230Z-0300Z, Oct 14
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	2000Z-2100Z, Oct 14
<a href="#"><u>+ JARTS WW RTTY Contest</u></a>	0000Z, Oct 15 to 2400Z, Oct 16
<a href="#"><u>+ ARRL EME Contest</u></a>	0000Z, Oct 15 to 2359Z, Oct 16

*Continued on Page 21*



## Contest Calendar - October 2022, Continued

<a href="#"><u>+ 10-10 Int. Fall Contest, CW</u></a>	0001Z, Oct 15 to 2359Z, Oct 16
<a href="#"><u>+ New York QSO Party</u></a>	1400Z, Oct 15 to 0200Z, Oct 16
<a href="#"><u>+ Worked All Germany Contest</u></a>	1500Z, Oct 15 to 1459Z, Oct 16
<a href="#"><u>+ Feld Hell Sprint</u></a>	2000Z-2359Z, Oct 15
<a href="#"><u>+ Argentina National 7 MHz Contest</u></a>	2130Z-2230Z, Oct 15
<a href="#"><u>+ Asia-Pacific Fall Sprint, CW</u></a>	0000Z-0200Z, Oct 16
<a href="#"><u>+ UBA ON Contest, 2m</u></a>	0700Z-1000Z, Oct 16
<a href="#"><u>+ Illinois QSO Party</u></a>	1700Z, Oct 16 to 0100Z, Oct 17
<a href="#"><u>+ RSGB RoLo CW</u></a>	1900Z-2030Z, Oct 16
<a href="#"><u>+ Run for the Bacon QRP Contest</u></a>	2300Z, Oct 16 to 0100Z, Oct 17
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	0000Z-0100Z, Oct 17
<a href="#"><u>+ ARRL School Club Roundup</u></a>	1300Z, Oct 17 to 2359Z, Oct 21
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1300Z-1400Z, Oct 17
<a href="#"><u>+ OK1WC Memorial</u></a>	1630Z-1729Z, Oct 17
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1900Z-2000Z, Oct 17
<a href="#"><u>+ RSGB FT4 Contest</u></a>	1900Z-2030Z, Oct 17
<a href="#"><u>+ Worldwide Sideband Activity Contest</u></a>	0100Z-0159Z, Oct 18
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	0300Z-0400Z, Oct 18
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Oct 18
<a href="#"><u>+ Phone Weekly Test</u></a>	0230Z-0300Z, Oct 19
<a href="#"><u>+ A1Club AWT</u></a>	1200Z-1300Z, Oct 19
<a href="#"><u>+ CWops Test</u></a>	1300Z-1400Z, Oct 19
<a href="#"><u>+ Mini-Test 40</u></a>	1700Z-1759Z, Oct 19
<a href="#"><u>+ VHF-UHF FT8 Activity Contest</u></a>	1700Z-2100Z, Oct 19
<a href="#"><u>+ Mini-Test 80</u></a>	1800Z-1859Z, Oct 19
<a href="#"><u>+ AGCW Semi-Automatic Key Evening</u></a>	1900Z-2030Z, Oct 19
<a href="#"><u>+ CWops Test</u></a>	1900Z-2000Z, Oct 19
<a href="#"><u>+ Walk for the Bacon QRP Contest</u></a>	0000Z-0100Z, Oct 20 and 0200Z-0300Z, Oct 21

*Continued on Page 21*



## Contest Calendar - October 2022, Continued

<a href="#"><u>+ CWops Test</u></a>	0300Z-0400Z, Oct 20
<a href="#"><u>+ CWops Test</u></a>	0700Z-0800Z, Oct 20
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Oct 20
<a href="#"><u>+ NTC QSO Party</u></a>	1900Z-2000Z, Oct 20
<a href="#"><u>+ NCCC RTTY Sprint</u></a>	0145Z-0215Z, Oct 21
<a href="#"><u>+ NCCC Sprint</u></a>	0230Z-0300Z, Oct 21
	1700Z-2000Z, Oct 21 (CW/Dig) and
	2200Z, Oct 21 to 0100Z, Oct 22 (SSB) and
<a href="#"><u>+ Telephone Pioneers QSO Party</u></a>	1700-2000Z, Oct 22 (SSB) and
	2200Z, Oct 22 to 0100Z, Oct 23 (CW/Dig)
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	2000Z-2100Z, Oct 21
<a href="#"><u>+ YBDXPI FT8 Contest</u></a>	0000Z, Oct 22 to 2359Z, Oct 23
<a href="#"><u>+ UK/EI DX Contest, SSB</u></a>	1200Z, Oct 22 to 1200Z, Oct 23
<a href="#"><u>+ YLRL DX/NA YL Anniversary Contest</u></a>	1400Z, Oct 22 to 0200Z, Oct 24
<a href="#"><u>+ Stew Perry Topband Challenge</u></a>	1500Z, Oct 22 to 1500Z, Oct 23
<a href="#"><u>+ North American SSB Sprint Contest</u></a>	0000Z-0400Z, Oct 23
	1300Z, Oct 23 to 0700Z, Oct 24 and
<a href="#"><u>+ Classic Exchange, CW</u></a>	1300Z, Oct 25 to 0700Z, Oct 26
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	0000Z-0100Z, Oct 24
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1300Z-1400Z, Oct 24
<a href="#"><u>+ OK1WC Memorial</u></a>	1630Z-1729Z, Oct 24
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1900Z-2000Z, Oct 24
<a href="#"><u>+ Worldwide Sideband Activity Contest</u></a>	0100Z-0159Z, Oct 25
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	0300Z-0400Z, Oct 25
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Oct 25
<a href="#"><u>+ SKCC Sprint</u></a>	0000Z-0200Z, Oct 26
<a href="#"><u>+ Phone Weekly Test</u></a>	0230Z-0300Z, Oct 26
<a href="#"><u>+ A1Club AWT</u></a>	1200Z-1300Z, Oct 26
<a href="#"><u>+ CWops Test</u></a>	1300Z-1400Z, Oct 26

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## Contest Calendar - October 2022, Continued

<a href="#"><u>+ Mini-Test 40</u></a>	1700Z-1759Z, Oct 26
<a href="#"><u>+ Mini-Test 80</u></a>	1800Z-1859Z, Oct 26
<a href="#"><u>+ CWops Test</u></a>	1900Z-2000Z, Oct 26
<a href="#"><u>+ UKEICC 80m Contest</u></a>	2000Z-2100Z, Oct 26
<a href="#"><u>+ CWops Test</u></a>	0300Z-0400Z, Oct 27
<a href="#"><u>+ CWops Test</u></a>	0700Z-0800Z, Oct 27
<a href="#"><u>+ RTTYOPS Weeksprint</u></a>	1700Z-1900Z, Oct 27
<a href="#"><u>+ RSGB 80m Autumn Series, SSB</u></a>	1900Z-2030Z, Oct 27
<a href="#"><u>+ NCCC RTTY Sprint</u></a>	0145Z-0215Z, Oct 28
<a href="#"><u>+ NCCC Sprint</u></a>	0230Z-0300Z, Oct 28
<a href="#"><u>+ Zombie Shuffle</u></a>	1600-2400 local, Oct 28
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	2000Z-2100Z, Oct 28
<a href="#"><u>+ CQ Worldwide DX Contest, SSB</u></a>	0000Z, Oct 29 to 2359Z, Oct 30
<a href="#"><u>+ Ham Spirit Contest, CW</u></a>	0600Z, Oct 29 to 0559Z, Oct 30
<a href="#"><u>+ K1USN Slow Speed Test</u></a>	0000Z-0100Z, Oct 31
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1300Z-1400Z, Oct 31
<a href="#"><u>+ QCX Challenge</u></a>	1300Z-1400Z, Oct 31
<a href="#"><u>+ OK1WC Memorial</u></a>	1630Z-1729Z, Oct 31
<a href="#"><u>+ ICWC Medium Speed Test</u></a>	1900Z-2000Z, Oct 31
<a href="#"><u>+ QCX Challenge</u></a>	1900Z-2000Z, Oct 31

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

### The ARAC RELAY



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