



# The RELAY)))

July 2023

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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# Summer 2023



Join us on Facebook!

## Hands-On History:

### 3 Ham Radio Museums to Visit This Summer

Last month's *Relay* took an interesting look at how Artificial Intelligence Machine Learning is currently being developed for amateur radio, as well as potential future impact on our hobby.

This month, as we celebrate with deep gratitude **America's 247th Birthday**, we'll highlight 3 museums that chronicle America's proud ham radio history, and exhibit the story of radio communication development overall.

**Amateur radio operators** began transmitting to each other via their home-made radio sets as the scrappy new hobby gained traction in the early 1900s. By 1908, students at **Columbia University** formed the first known "wireless" club and simply used their initials with each other in "over the air" identification.

One hundred years ago in 1923, the first transatlantic contact occurred between amateurs in Connecticut and England, marking the first **long-distance** communication. Following this, international conferences were held in 1927 & 1928 that resulted in the creation of callsigns by country and the designation of what are basically today's 80-/75-, 40-, 20-, and 10-meter bands. By the end of the 1920s, amateur radio operators were given bands from 160 through 5 meters, as well as some additional bandwidth on UHF at 400 MHz.

If you happen to already be traveling this summer in the vicinity of one of these museums, take the opportunity to visit them for a hands-on experience of some amazing old ham radio equipment. They in-



April 1925 magazine cover of *The Experimenter*, captioned "Getting on the Air". The publication encouraged citizen exploration of "Electricity - Radio - Chemistry."

Continued on Page 14

# ARAC Board Meeting Minutes - June 6, 2023

## PRESIDENT



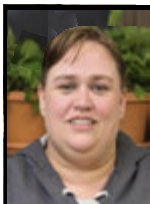
**NØVRM**  
Gene Ellefsen  
3710 Chambersburg Ave  
Duluth, MN 55811  
218-390-3272  
lspitech@mail.com

## VICE PRESIDENT



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

## SECRETARY



**KFØGJW**  
Melinda Nelson

## TREASURER



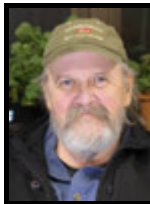
**KEØYTM**  
Sam Frey  
  
ke0ytm@gmail.com

## 3RD YEAR BOARD



**AAØAC**  
Dave Davis  
  
218-348-6649  
aa0ac@outlook.com

## 2ND YEAR BOARD



**AAØAW**  
Doug Nelson  
  
aa0aw@arrl.net

## 1ST YEAR BOARD



**WØDIO**  
Denny Anderson

### Present:

#### **Board Members**

Gene Ellefsen – NØVRM, Dave Pyrlík – KØDJP, Melinda Nelson – KFØGJW, Dave Davis – AAØAC, Doug Nelson - AAØAW, Dennis Anderson – WØDIO

#### **Board Advisors (Non-Board Members)**

Grant Forsyth – KCØWUP

**Guest:** Elmer Berg – KCØNGY, Rochelle Nelson

Meeting called to order by President Gene – NØVRM at 18:64 (6:64 pm)

### Minutes:

Minutes were sent via email. Motion to approve Doug Nelson – AAØAW. Seconded by Dave Davis – AAØAC, motion passed.

### Treasurer's Report:

Sam Frey – KEØYTM was out sick.

### Repeater:

Dave Pyrlík – KØDJP report on Mahtowa. Pulled out old equipment. Installed new equipment, cleaned up the building. As of today, we do not have a date for the linking. The repeater should get a good workout this weekend with the MS150. The property will need the grass cut and cleaned up some.

Gene Ellefsen and Randy Wabik had a meeting on Monday with John Panzer from WDSE. As of right now WDSE does not have any scheduled tower work for this year. There was discussion about changing the feed line and John says that should not be an issue.

### Grandma's Marathon:

Thursday night we will pass things out and try to get everyone the right sizes. We will have a little presentation. They are figuring about 25% no-show for the race. I think Alivia Nelson from Grandma's office is coming to the meeting. I will need the projector for Thursday for a little presentation.

### Field Day:

Weekend after Grandma's we have Parking Lot C on Spirit Mountain and we have the porta-potty reserved. \$100.00 for food and water, motion made by Melinda Nelson – KFØGJW, seconded by Dave Davis – AAØAC. Motion passed.

### Testing:

The new General Testing Pool is out and will go into effect on July 1<sup>st</sup>. As always if you are looking to test or upgrade, or know of anyone that is interested in testing please contact Doug Nelson at [AAØAW@arrl.net](mailto:AAØAW@arrl.net)

Motion to adjourn by Doug Nelson – AAØAW. Seconded by Dave Davis – AAØAC, motion passed at 19:14 (7:14 pm)



# ARAC Club Meeting Minutes

June 8th, 2023

## Present:

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

## Absent:

First Year Board: Dennis Anderson – W0DIO  
Third Year Board: Dave Davis – AA0AC  
Repeater: Dave Pyrlik – K0DJP  
Chaplin:  
Web Site: Thomas Dorr – KE0RHA  
Newsletter/Historian: Kim Waller – KE0NQS  
Newsletter/Historian: Steve Waller – KE0NQT

Meeting called to order at 19:00 (7:00 PM) by President Gene Ellefsen – N0VRM. Sixty-two (62) members were in attendance.

## Minutes:

Minutes are posted on the website and in the newsletter. Motion to accept by Jon Nelson – N0UOZ. Motion Passed.

## Treasurer's Report:

Checking: \$4,474.06  
Savings: \$1,375.68  
Repeater: \$3,118.54  
**Subtotal Cash \$8,968.28**

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

**Assets Subtotal: \$10,704.77**

Continued on Page 4



## ARAC Club Meeting Minutes, continued

Motion to accept as presented by Bob Schulz – KC0NFB, seconded by Jon Nelson – N0UOZ, motion passed.

Doug Nelson – AA0AW a group of members went up to Joe Meese's house and took down some towers. Cheryl donated the towers to ARAC Club. The members had first pick of the towers if anyone wanted. A member bought a tower for \$200.00. Doug recommends that this money be put into the repeater fund. Motion to put the money from the tower into the repeater fund made by William Fleischman – KC0ZZL, seconded by Robin Davis. Motion approved.

### **Repeater:**

Dave Pyrlík – K0DJP report on Mahtowa. Pulled out old equipment. Installed new equipment, cleaned up the building. As of today, we do not have a date for the linking. The repeater should get a good workout this weekend with the MS150. The property will need the grass cut and cleaned up some.

Gene Ellefsen and Randy Wabik had a meeting on Monday with John Panzer from WDSE. As of right now WDSE does not have any scheduled tower work for this year. There was discussion about changing the feed line and John says that should not be an issue.

### **New Business:**

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

Door Prize was won by Raymond Barnes – KE0ZN.

Motion to adjourn by Bob Schulz – KC0NFB, seconded by Grant Forsyth – KC0WUP, motion passed at 19:13 (7:13 PM). Program tonight is on Grandma's Marathon.



**CLUB REPEATER**

**WØGKP**

**146.94 (-)**

**CTCSS TONE**

**103.5**





# Prez Sez...

**Hi Everyone,**

Well, Field Day 2023 is over and it was fun!

We had 4 stations operating at Spirit Mountain; you can see pictures on our ARAC Facebook page. Over 1,000 contacts were made using SSB, CW and FT8. There was a lot of help for setup and take down. Thank you!!! If you didn't make it this year, try next year! Those that came out had a good time and were able to learn about HF and the different modes.

Keep Sunday August 5 open. That is the day for the ARAC Annual Picnic out at Chambers Grove Park in the Fond du Lac neighborhood. Enjoy your Summer!

73s,

**Gene Ellefsen NØVRM**



**LOOKING for an Amateur Radio License TESTING SESSION?**

***Schedule your own Testing Session TODAY!***

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

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

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

**Upgrading to General or Expert Class & not sure you have an FRN number? go to**

**<https://wireless2.fcc.gov/UlsApp/UlsSearch/searchLicense.jsp>**

**UPGRADE CANDIDATES:**

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

# CW Abbreviations

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

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



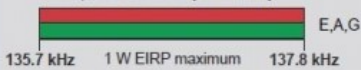
## US Amateur Radio Bands

### US AMATEUR POWER LIMITS

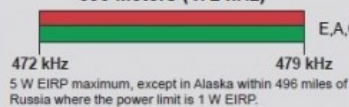
FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

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

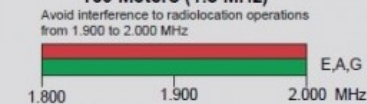
#### 2,200 Meters (135 kHz)



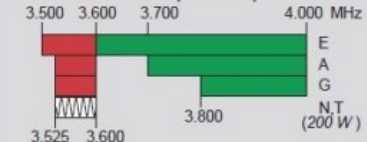
#### 630 Meters (472 kHz)



#### 160 Meters (1.8 MHz)



#### 80 Meters (3.5 MHz)

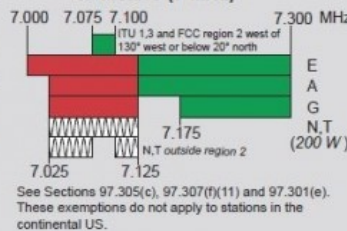


#### 60 Meters (5.3 MHz)

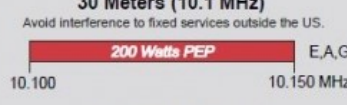


General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated power (ERP) of 100 W PEP relative to a half-wave dipole. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such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

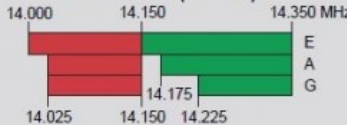
#### 40 Meters (7 MHz)



#### 30 Meters (10.1 MHz)



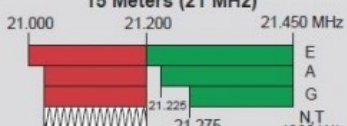
#### 20 Meters (14 MHz)



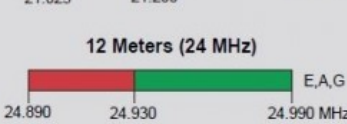
#### 17 Meters (18 MHz)



#### 15 Meters (21 MHz)



#### 12 Meters (24 MHz)



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



ARRL THE NATIONAL ASSOCIATION FOR AMATEUR RADIO

### KEY

Note: CW operation is permitted throughout all amateur bands.

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

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

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

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

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

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Toll-Free 1-800-326-3942 (860-594-0355)  
email: [newham@arrl.org](mailto:newham@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





# 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





# DULUTH AREA REPEATERS, continued

## NARC System NAØRC

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

## Stand Alone Repeaters

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

## Fusion

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

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

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

444.300 +5.00 103.5 NØEO Duluth, MN – Spirit Valley Amateurs Fusion Repeater WIRES-X NØEO (Analog only) Fusion Room 40494

444.400 +5.00 103.5 NAØRC Knife River, MN – Wires X Connected to NØEO Room 40494  
 444.500 +5.00 103.5 NØLCR Two Harbors, MN – Wires X Connected to NØEO Room 40494  
 444.600 +5.00 103.5 NØLCR Silver Bay, MN – Wires X Connected to NØEO Room 40494  
 444.800 +5.00 103.5 NØLCR Grand Marais, MN – Wires X Connected to NØEO Room 40494

## D-Star

147.375 plus NØEO D Star  
 442.200 plus NØEO D Star

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

# Elmers

## El-mer / el-mər/ [el-mer]

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

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



# UPCOMING EVENTS

## Next ARAC Board Meeting

Tuesday, July 4, 2023 @ 6:30 p.m. - Sammy's Spirit Valley

## NEXT ARAC CLUB MEETING

Thursday, July 13, 2023 @ 7:00 p.m. - Coppertop Church



# HAPPY INDEPENDENCE DAY!



# Thanks to All our Veterans!

# Membership E-mail Directory

Ahlgren, Scott NØVYU  
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rabakke46@aol.com

Barnes, Ray KEØZN  
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Bockbrader, Jonah KEØCXD  
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Dall, Teresa KAØCDO  
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kcØwdq@yahoo.com

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tferg5@msn.com

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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



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

# JULY

## 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 NØPDG USB 2000 NØVRM ES 2100 AAØAW	3  WX 2000 KCØMKS	4 <sup>th</sup> Happy Independence Day! ARAC BOARD MEETING Sammy's Pizza 6:30 pm DC Net 2000 CC Net 2030	5  2100 - BWAR	6	7	8
9  CW 1930 AAØAW USB 2000 NØPDG ES 2100 KD9VKI	10  DC ARES/ RACES Mtg 1900 DC EOC  WX 2000 KCØMKS	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 NØPDG USB 2000 AAØAW ES 2100 KCØWDQ	17  WX 2000 KCØMKS	18  DC Net 2000 CC Net 2030	19  St Louis County ARES/RACES Meeting 1800  2100 - BWAR	20	21	22
23  CW 1930 AAØAW USB 2000 KB9WLB ES 2100 WØNWØ	24  WX 2000 KCØMKS	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 8 am
30  CW 1930 NØPDG USB 2000 K9KDK ES 2100 NØVRM	31  WX 2000 KCØMKS					



Get this newsletter *faster*  
via email!

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

Next Club Meeting:  
Thursday,  
July 13th, 2023 - 7 pm  
at the Coppertop Church!

## ARAC Committee Chairs



**Club License Trustee:**

Ray Barnes KEØZN

**Control Operators:**

AAØAW - NØKXT - KCØNFB

**Newsletter/Historian:**

Kim KEØNQS & Steve KEØNQT  
Waller

**Education Chair:**

Bob Schulz KCØNFB

**Hamfest Chair:**

Bob Schulz KCØNFB

**Chaplain:**

Rollie Bockbader KBØCK

**Visiting Chaplain:**

**Parliamentarian:**

Grant Forsyth KCØWUP

**Website:**

Thomas Dorr KEØRHA

**Membership:**

Sam Frey KEØYTM

**Property Chair:**

Scott Ahlgren NØVYU

**Testing:**

Doug Nelson AAØAW

**Field Day:**

**Picnic Chair:**

Scott Ahlgren, NØVYU

**Repeater Chairs:**

Randy Haglin NØBZZ  
Randy Wabik KAØJZV

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

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

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

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

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

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

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

## Museums *continued from page 1*

vite the public not only to view but to operate much of the antique equipment. Ham radio transmitters that are fully operational require appropriate proof of your license, of course. These museums each have hundreds of artifacts that range from the earliest time in ham radio to fairly recent.

### **Museum of Radio & Technology** 1640 Florence Ave Huntington, WV 25701

Near the tri-state corner of West Virginia, Ohio and Kentucky, this museum occupies a 10,000 square-foot historic brick school house and is open weekends year-round. Free to the public, the museum has bragging rights to 13 fully operational stations in its ham shack and asks “Did you ever want to compare a Drake System to a Collins S-Line station? We have them sitting side by side for a visitor with an appropriate Amateur Radio License to operate.”

Hard-to-resist bait for those who’d love to see two rival ham radio equipment companies’ interpretation of state-of-the-art, mid-century modern, form & function.

**Museum of Radio and Technology** even has online lists of some of the ham radio equipment they exhibit under the categories of Transmitters, Receivers, Transceivers, Transmitter Accessories, Receiver Accessories, and Telegraph Keys.

Catalogued by Manufacturer (including the descriptor “homemade”), they include Model #, date ranges of use, and the original manufacturer’s “Label Write-Up”, which is basically text from a magazine or catalog ad. Very cool.

### **Mission**

Self-described as having one of the largest radio collections in the country, they say: “The mission of the Museum of Radio and Technology is to preserve, restore, display, celebrate, and explain historic electronic equipment, programs and other artifacts from broadcasting’s heritage; to provide education in the history of broadcasting and electronics as well as in the repair and restoration of electronics equipment; to offer an enriching cultural experience to citizens of and visitors to our region and, thus, to enhance their lives; and to bring credit to our region as the repository for a collection of historic objects that is acclaimed for its excellence throughout the world.”

For more information about **Museum of Radio and Technology**, visit [www.mrtwv.org](http://www.mrtwv.org) or contact them at: Email: [mrattwv@gmail.com](mailto:mrattwv@gmail.com) Phone: (304) 525-8890

Now if you find yourself on the eastern seaboard this summer, make sure you visit the lovely state of

*Continued on Page 15*



**Museum of Radio & Technology** website screenshots. They house a nice collection of amateur radio artifacts, including accessories and keyers. Other curated exhibits are industry posters, signs, broadcast radios receivers of all kinds, televisions, television tubes, TV camera, early computers, citizens band, speakers, vintage vinyl records, a collection of military equipment and a technical library. View the museum website at <https://www.mrtwv.org>



Connecticut to visit the following museum:

## **The Vintage Radio and Communications Museum of Connecticut** 115 Pierson Lane, Windsor CT 06095

This nicely curated museum has an extensive collection artifacts in the categories of Amateur Radio, Radio & Phonograph, Film & Television, Broadcasting Studio Equipment, Telephone & Telegraph, Computers, and Jukeboxes & Player Pianos.

The museum collection has items ranging from the 1800's to the late 20th century. Each exhibit category is organized in aisles of successive decades, so visitors can see the progression of technology sequentially or immediately locate a specific timeframe of history that interests them.

Many displays are hands-on, inviting you to "Tap out your name in Morse Code," "Tune a 1925 radio," "Crank a wind-up phonograph," "Listen to a home-made crystal set," and "Pick a song from a working juke box".

Check out the museum's amateur radio station **W1VCM** and hear ham operators from all over the world communicating in voice and Morse code. Visiting hams with a valid copy of their license can even operate the station. Their amateur radio exhibit has really nice examples of equipment "going back to the days hams built their own radios."

In addition, **The Vintage Radio and Communications Museum** houses an extensive research library with factory manuals, schematics, QST magazines and other historical data. You can view a catalog of the Museum Library at <https://www.librarything.com/catalog/VRCMCT>

This museum is assembled and lovingly maintained by a staff of dedicated local volunteers, including members of the "in-house" ARRL **Amateur Radio Club W1VCM**. They say, "Our club exists for the benefit of the museum, used as a teaching element of radio, radio theory, World-wide signal propagation and international goodwill. Our Vision: To make Amateur Radio relevant and engaging for all visiting of the Vintage Radio and Communications Museum of Connecticut."

Open year-round on Thursdays through Sundays, **VRCM** admission is free for children under 5; \$5 for military members, students and special needs; \$7 for seniors; and \$10 for adults. For more information on museum hours and content, visit <https://www.vrcmct.org> or contact them via email at [radioctr@aol.com](mailto:radioctr@aol.com) Our last featured museum brings us to the site of a lovely family farm in the



### WELCOME TO THE VINTAGE RADIO AND COMMUNICATIONS MUSEUM

We are an all-volunteer run museum located in Windsor, Connecticut, offering a fascinating and educational look back in time (and technology). Take a walk through history from Morse Code transmitters to radio & television to personal computers, and everything in between.

**Vintage Radio & Communications Museum** The museum exhibits are organized along a timeline from the 1800s through to the late 20th Century, with artifact aisles identified by successive decades. Choose a self-guided tour using their printed guidebook or a staff-guided tour.

### AMATEUR RADIO STATION - W1VCM

Visit the museum's amateur radio station W1VCM and hear from operators from all over the world communicating in voice and Morse code. Visiting hams with a valid copy of their license can even operate the station. We also have a fine exhibit going back to the days hams built their own radios.





state of Kansas:

### **The Ensor Park and Museum**

18995 W 183rd St, Olathe KS 66062

Located in Olathe, Kansas, near the southern edge of the Kansas City metro area, this National Historic Site is owned by the City of Olathe and staffed by volunteers from the [Santa Fe Trail Amateur Radio Club](#) and the [Johnson County Radio Amateurs Club \(JCRAC\)](#). This farm was originally the home of Jacob and Ida Ensor and their two children, Marshall and Loretta. Here's an in-depth description from the Museum:



**The Ensor Park and Museum** original farmhouse and the 80-foot radio tower. Located in Olathe, Kansas, the Museum is operated and maintained by volunteers of Santa Fe Trail Amateur Radio Club and the Johnson County Radio Amateurs Club

Visitors can enjoy an hour-long tour of the vintage 1890, memory-packed two-story farmhouse and an even older peg barn that showcases tools, farm equipment, radio transmitters and receivers, and teaching materials.

Also displayed are beautiful hand-crafted objects that include rockers, tables, wine coolers, utensil racks, spinning wheels, an electric scoreboard (for a basketball court), needlework, bowls, coat trees, gavels, and much, much more.

An iconic 80-foot-high radio tower next to the farmhouse relates to special historic amateur radio work done over a span of 50 years during the lives of Marshall H. Ensor and his sister Loretta Ensor.

In 1929, Marshall responded to an appeal from the American Radio Relay League for amateur radio operators to use their radios to train people to become amateur radio operators. He began transmitting lessons on Morse Code, basic electrical concepts and circuits, and good radio operating practices. Every December he started a series of 50 or more one-hour lessons that continued six days per week until late January and sometimes early February. The only reason for a lesson to be cancelled was lightning near the Ensor Farm. He refined the material in his course each year, and in 1940 the lessons became the bedrock of his Master's Thesis "Teaching Radio by Radio." By 1939, an estimated 10,000 people had honed the skills needed to earn an amateur radio license, and many

of these people went on to serve as radio operators or technical specialists in one of the branches of the US armed forces.

Because of Marshall's extraordinarily effectiveness in teaching radio by radio, the **ARRL** nominated Marshall for the **1940 Wm. S. Paley Amateur Radio Award**. The award recognized the individual who, through amateur radio, had contributed most usefully to the American people, either in research, technical development, or operating achievement. On June 2, 1941, Mr. Ensor received the 1940 Paley Award at a huge ceremony at the Waldorf Astoria Hotel Ballroom in New York City. The event, attended by many dignitaries, was broadcast live on CBS Radio. Loretta Ensor provided crucial support for the "Radio by Radio" lessons, as she was also a competent and licensed amateur radio operator. Loretta transmitted the lesson on any evening on which Marshall had late duties at the high school. The Columbia Broadcasting System recognized Loretta's significant contribution to the success of the "Radio by Radio" lessons and arranged for her to accompany Marshall to New York and to be recognized during the Paley Award ceremony.

*Continued on Page 17*



## Museums *continued from page 16*

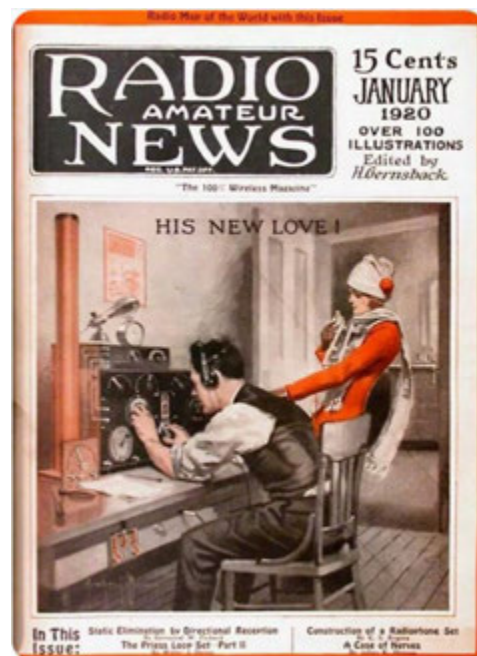
Marshall Ensor retired from teaching in 1965 and he and Loretta set out to arrange tools, radio gear, and handcrafted furnishings in attractive displays so that interested visitors might “take a trip to yesteryear” and see what farm life, a teaching career, and early amateur radio was like.

This site is perfect for an end of summer visit, as it closed for a summer hiatus on June 25th, but will be back beginning September 2nd. The Ensor Museum is open to the public for guided tours during the months of May, June, September, and October on Saturdays & Sundays from 1 PM to 5 PM. There is no charge for admission, however donations help to sustain the museum and are gladly accepted.

For more information, visit the **Ensor Park and Museum** website at [www.ensorparkandmuseum.org](http://www.ensorparkandmuseum.org)

We hope you enjoyed this brief look at three organizations that are dedicated to preserving ham radio artifacts and telling their history. Our hats are off to all who volunteer to make these very special sites available to the public to experience unforgettable “hands-on” history.

Do you have a great ham radio history site to share? Tell us about it at [ke0nqs.mn@gmail.com](mailto:ke0nqs.mn@gmail.com) and we'll publish it in a future edition of the Relay! ★



More 1920s Magazine covers: ARRL's *QST* and *Radio Amateur News*, which later shortened its name to *Radio News*. Red & orange were the go-to colors!



# Contest Calendar - July 2023

+ RAC Canada Day Contest	0000Z-2359Z, Jul 1
+ Venezuelan Ind. Day Contest	0000Z-2359Z, Jul 1
+ NZART Memorial Contest	0800Z-1100Z, Jul 1 and 0800Z-1100Z, Jul 2
+ Marconi Memorial HF Contest	1400Z, Jul 1 to 1400Z, Jul 2
+ Original QRP Contest	1500Z, Jul 1 to 1500Z, Jul 2
+ K1USN Slow Speed Test	0000Z-0100Z, Jul 3
+ ICWC Medium Speed Test	1300Z-1400Z, Jul 3
+ OK1WC Memorial	1630Z-1729Z, Jul 3
+ ICWC Medium Speed Test	1900Z-2000Z, Jul 3
+ RSGB 80m Club Championship, CW	1900Z-2030Z, Jul 3
+ Worldwide Sideband Activity Contest	0100Z-0159Z, Jul 4
+ ARS Spartan Sprint	0100Z-0300Z, Jul 4
+ ICWC Medium Speed Test	0300Z-0400Z, Jul 4
+ Phone Weekly Test	0230Z-0300Z, Jul 5
+ A1Club AWT	1200Z-1300Z, Jul 5
+ CWops Test	1300Z-1400Z, Jul 5
+ VHF-UHF FT8 Activity Contest	1700Z-2100Z, Jul 5
+ Mini-Test 40	1700Z-1759Z, Jul 5
+ Mini-Test 80	1800Z-1859Z, Jul 5
+ CWops Test	1900Z-2000Z, Jul 5
+ Walk for the Bacon QRP Contest	0000Z-0100Z, Jul 6 and 0200Z-0300Z, Jul 7
+ CWops Test	0300Z-0400Z, Jul 6
+ CWops Test	0700Z-0800Z, Jul 6 1700Z-1800Z, Jul 6 (CW) and 1800Z-1900Z, Jul 6 (SSB) and 1900Z-2000Z, Jul 6 (FM) and 2000Z-2100Z, Jul 6 (Dig)
+ NRAU 10m Activity Contest	

*Continued on Page 19*



# Contest Calendar - July 2023

+ SKCC Sprint Europe	2000Z-2200Z, Jul 6
+ NCCC FT4 Sprint	0100Z-0130Z, Jul 7
+ QRP Fox Hunt	0100Z-0230Z, Jul 7
+ NCCC RTTY Sprint	0145Z-0215Z, Jul 7
+ NCCC Sprint	0230Z-0300Z, Jul 7
+ K1USN Slow Speed Test	2000Z-2100Z, Jul 7
+ IARU HF World Championship	1200Z, Jul 8 to 1200Z, Jul 9
+ SKCC Weekend Sprintathon	1200Z, Jul 8 to 2400Z, Jul 9
+ PODXS 070 Club 40m Firecracker Sprint	2000Z, Jul 8 to 2000Z, Jul 9
+ QRP ARCI Summer Homebrew Sprint	2000Z-2300Z, Jul 9
+ K1USN Slow Speed Test	0000Z-0100Z, Jul 10
+ 4 States QRP Group Second Sunday Sprint	0000Z-0200Z, Jul 10
+ ICWC Medium Speed Test	1300Z-1400Z, Jul 10
+ OK1WC Memorial	1630Z-1729Z, Jul 10
+ ICWC Medium Speed Test	1900Z-2000Z, Jul 10
+ Worldwide Sideband Activity Contest	0100Z-0159Z, Jul 11
+ ICWC Medium Speed Test	0300Z-0400Z, Jul 11
+ Phone Weekly Test	0230Z-0300Z, Jul 12
+ A1Club AWT	1200Z-1300Z, Jul 12
+ CWops Test	1300Z-1400Z, Jul 12
+ Mini-Test 40	1700Z-1759Z, Jul 12
+ VHF-UHF FT8 Activity Contest	1700Z-2100Z, Jul 12
+ Mini-Test 80	1800Z-1859Z, Jul 12
+ RSGB 80m Club Championship, SSB	1900Z-2030Z, Jul 12
+ CWops Test	1900Z-2000Z, Jul 12
+ CWops Test	0300Z-0400Z, Jul 13
+ CWops Test	0700Z-0800Z, Jul 13
+ EACW Meeting	1900Z-2000Z, Jul 13

*Continued on Page 20*



# Contest Calendar - July 2023

+ NCCC FT4 Sprint	0100Z-0130Z, Jul 14
+ QRP Fox Hunt	0100Z-0230Z, Jul 14
+ NCCC RTTY Sprint	0145Z-0215Z, Jul 14
+ NCCC Sprint	0230Z-0300Z, Jul 14
+ K1USN Slow Speed Test	2000Z-2100Z, Jul 14
+ Russian Radio Team Championship	0700Z-1459Z, Jul 15
+ Trans-Tasman Low-Bands Challenge	0800Z-1400Z, Jul 15
+ Feld Hell Sprint	1200Z-1359Z, Jul 15
+ IARU Region 1 70 MHz Contest	1400Z, Jul 15 to 1400Z, Jul 16
+ North American QSO Party, RTTY	1800Z, Jul 15 to 0559Z, Jul 16
+ CQ Worldwide VHF Contest	1800Z, Jul 15 to 2100Z, Jul 16
+ RSGB International Low Power Contest	0900Z-1200Z and 1300Z-1600Z, Jul 16
+ Run for the Bacon QRP Contest	2300Z, Jul 16 to 0100Z, Jul 17
+ K1USN Slow Speed Test	0000Z-0100Z, Jul 17
+ ICWC Medium Speed Test	1300Z-1400Z, Jul 17
+ OK1WC Memorial	1630Z-1729Z, Jul 17
+ ICWC Medium Speed Test	1900Z-2000Z, Jul 17
+ RSGB FT4 Contest	1900Z-2030Z, Jul 17
+ Worldwide Sideband Activity Contest	0100Z-0159Z, Jul 18
+ ICWC Medium Speed Test	0300Z-0400Z, Jul 18
+ Phone Weekly Test	0230Z-0300Z, Jul 19
+ A1Club AWT	1200Z-1300Z, Jul 19
+ CWops Test	1300Z-1400Z, Jul 19
+ Mini-Test 40	1700Z-1759Z, Jul 19
+ VHF-UHF FT8 Activity Contest	1700Z-2100Z, Jul 19
+ Mini-Test 80	1800Z-1859Z, Jul 19
+ CWops Test	1900Z-2000Z, Jul 19
+ Walk for the Bacon QRP Contest	0000Z-0100Z, Jul 20 and 0200Z-0300Z, Jul 21

*Continued on Page 21*





# Contest Calendar - July 2023

+ NAQCC CW Sprint	0030Z-0230Z, Jul 20
+ CWops Test	0300Z-0400Z, Jul 20
+ CWops Test	0700Z-0800Z, Jul 20
+ NTC QSO Party	1900Z-2000Z, Jul 20
+ NCCC FT4 Sprint	0100Z-0130Z, Jul 21
+ QRP Fox Hunt	0100Z-0230Z, Jul 21
+ NCCC RTTY Sprint	0145Z-0215Z, Jul 21
+ NCCC Sprint	0230Z-0300Z, Jul 21
+ K1USN Slow Speed Test	2000Z-2100Z, Jul 21
+ Maidenhead Mayhem Contest	0000Z, Jul 22 to 2359Z, Jul 30
+ YOTA Contest	1000Z-2159Z, Jul 22
+ ARAM 50 MHz Contest	1200Z, Jul 22 to 1200Z, Jul 23
+ K1USN Slow Speed Test	0000Z-0100Z, Jul 24
+ ICWC Medium Speed Test	1300Z-1400Z, Jul 24
+ OK1WC Memorial	1630Z-1729Z, Jul 24
+ ICWC Medium Speed Test	1900Z-2000Z, Jul 24
+ Worldwide Sideband Activity Contest	0100Z-0159Z, Jul 25
+ ICWC Medium Speed Test	0300Z-0400Z, Jul 25
+ SKCC Sprint	0000Z-0200Z, Jul 26
+ Phone Weekly Test	0230Z-0300Z, Jul 26
+ A1Club AWT	1200Z-1300Z, Jul 26
+ CWops Test	1300Z-1400Z, Jul 26
+ Mini-Test 40	1700Z-1759Z, Jul 26
+ Mini-Test 80	1800Z-1859Z, Jul 26
+ CWops Test	1900Z-2000Z, Jul 26
+ CWops Test	0300Z-0400Z, Jul 27
+ CWops Test	0700Z-0800Z, Jul 27
+ RSGB 80m Club Championship, Data	1900Z-2030Z, Jul 27

*Continued on Page 22*

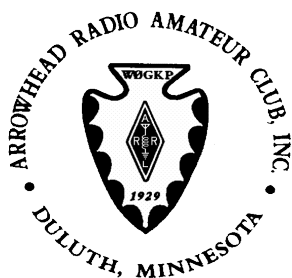
# Contest Calendar - July 2023

+ NCCC FT4 Sprint	0100Z-0130Z, Jul 28
+ QRP Fox Hunt	0100Z-0230Z, Jul 28
+ NCCC RTTY Sprint	0145Z-0215Z, Jul 28
+ NCCC Sprint	0230Z-0300Z, Jul 28
+ K1USN Slow Speed Test	2000Z-2100Z, Jul 28
+ MARAC US Counties QSO Party	0000Z, Jul 29 to 2400Z, Jul 30
+ Feld Hell Sprint	0000Z-2359Z, Jul 29
+ RSGB IOTA Contest	1200Z, Jul 29 to 1200Z, Jul 30
+ WAB 144 MHz Low Power Phone	1400Z-1800Z, Jul 29
+ ARS Flight of the Bumblebees	1700Z-2100Z, Jul 30
+ K1USN Slow Speed Test	0000Z-0100Z, Jul 31
+ ICWC Medium Speed Test	1300Z-1400Z, Jul 31
+ QCX Challenge	1300Z-1400Z, Jul 31
+ OK1WC Memorial	1630Z-1729Z, Jul 31
+ ICWC Medium Speed Test	1900Z-2000Z, Jul 31
+ QCX Challenge	1900Z-2000Z, Jul 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



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

