ARROWHEAD RADIO AMATEUR CLUB, INC. • DULUTH, MINNESOTA • WØGKP • 1929

The RELAY

JULY 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

INDEX

The Relay Co-Editors:

Kim & Steve Waller

Kim - KEØNQS KEØNQS.mn@gmail.com

Steve - KEØNQT KEØNQT@gmail.com

SUMMER 2022

Join us on Facebook!

Amateur Radio & Kayaking?

Enthusiasts Claim "Perfect Combo"

In Minnesota, we love our canoes and kayaks. Statistca.com says that in 2020, there were approximately 18.12 million participants in kayaking in the United States, up from 16.62 million the previous year.

Though I couldn't find recent registration numbers for Minnesota *only*, a Minnesota Department of Natural Resources study released way back in November 2005 acknowledged that the "human-powered boating category" of canoeing and kayaking were growing rapidly in popularity. And in that category, kayaking was becoming the fastest growing water sport, swiftly surpassing canoes. The DNR said that in the previous 4 years, canoe registrations had stayed the same, but kayak registrations had doubled, with the overall number of registered canoes and kayaks reaching 172,442 in 2004. So that was *18 years ago*! Now kayak sales and rentals clearly dominate the "human-powered boating category". When you visit our lakes, rivers and streams, you see mostly kayaks. Most camps and parks now have far more kayaks than canoes available to rent. Many sporting goods sellers offer a variety of kayaks, but very few canoes. One national seller that also has a storefront in Duluth has a staggering **75 models of kayaks** available, but just 3 canoes made by the brand Old Town. Old Town Company began in 1898, making wooden canoes and accessories. Now they manufacture just 12 polyethylene canoe styles and 43 kayak models. More and more, traditional wooden canoes are being offered only by specialty shops, sometimes even handcrafted, with an emphasis on beauty and style. Kayaks come in a wide selection to suit your needs. If you'd like to bring a variety of fishing,

Continued on Page 15

Photo Credit: Robert Krasowski NW2Z

"Kayak Mobile"
Dan Romanchik KB6NU in Ann Arbor, MI has a site called KB6NU's Ham Radio Blog. In an archive post from Aug 13, 2020 entitled "Operating Notes: Bands better?, kayak mobile", he shares a nice photo from Robert Krasowski NW2Z in Asheboro, North Carolina. Dan says he'd been working on 40m and got a call from NW2Z. Turns out Robert was calling from a small island off the N.C. coast after kayaking out to the island and setting up his station, consisting of a KX-2, running about 10 watts & and end-fed antenna. He says that the mast was a 32 ft telescoping fiberglass mast with a great signal, peaking at S7 in Michigan.

Visit KB6NU's Ham Radio Blog post at
https://www.kb6nu.com/operating-notes-bands-better-kayak-mobile/

ARAC Board Meeting - June 7, 2022

PRESIDENT

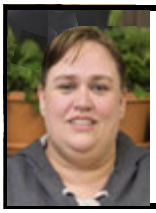
NØVRM
Gene Ellefsen
371Ø Chambersburg Ave
Duluth, MN 55811
218-39Ø-3272
lspitech@mail.com

VICE PRESIDENT

KØDJP
David Pyrlik

david.pyrlik@gmail.com

SECRETARY



KFØGJW
Melinda Nelson

TREASURER

KNØNUL
Bruce Carlson
9Ø6 Anderson Rd
Duluth, MN 55811
763-315-2967
carlsbr@gmail.com

3RD YEAR BOARD

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

2ND YEAR BOARD

AAØAC
Dave Davis

218-348-6649
aaøac@outlook.com

1ST YEAR BOARD

AAØAW
Doug Nelson

aaøaw@arrl.net

Present:

Board Members

Gene Ellefsen – N0VRM, Bruce Carlson – KN0NUL, Doug Nelson – AA0AW, Gary Minter – KD9ABS, Melinda Nelson – KF0GJW, Dave Davis – AA0AC

Board Advisors (Non-Board Members)

Bob Schulz – KC0NFB, Kim Waller – KE0NQS, Steve Waller – KE0NQT, Randy Wabik – KR0B, Grant Forsyth – KC0WUP

Guest: Elmer Berg – KC0NGY, Del Minter – KE0CLI, Rochelle Nelson

Meeting called to order by President Gene – N0VRM at 18:38 (6:38 pm)

There was a discussion about Minute Procedures and New Letter with Board Advisors.

Minutes:

Minutes were sent to Board Members via email. There were no questions or comments made. Motion to approve by Doug Nelson – AA0AW, seconded by Bruce Carlson – KN0NUL, motion passed.

Treasurer's Report:

Checking: $1,469.28
Savings: $4,074.44
Repeater: $4,920.31
Subtotal Cash $10,464.03

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

Assets Subtotal: $12,194.45

Minus Checks Outstanding:
1447 Douglas County $260.00
Checks Subtotal: $260.00

Grand Total: $11,934.45

Continued on Page 3

ARAC Board Meeting - continued from page 2

Some big expenses coming up donation to the First United Methodist, and donation to WDSE for antenna. Motion to bring to club to donate $1,200.00 to WDSE by Bruce Carlson – KN0NUL, seconded by Gary Minter – KD9ABS, motion carried. Would like to buy our Summer DC back in July if possible. Will come to the board before purchase of CD. Motion to accept report as provided by Doug Nelson – AA0AW, seconded by Gary Minter – KD9ABS, motion passed.

HamFest:
Discussion about rising entry fee to $10.00 to cover the tax to Douglas County. Had good donations for door prizes. Thank you everyone for the donations.

Grandma's Marathon:
Thursday's meeting will be Grandma's Marathon. There should be three (3) representatives from Grandma's at the meeting. Roster posted on Facebook. We have seven (7)new volunteers this year and they are new hams. Good luck and thank you everyone!

Field Day:
We had a disaster 2 years ago. Hoping to get new participation. No news yet if we can use the St. Louis County Trailer. Douglas County Trailer should hear something at the meeting on Monday.

Repeater:
Randy Wabik – KR0B, Mahtowa – found the problem by Dave Snyder – AB9AC who climbed the tower. There was a jumper that had water in it, he removed the jumper and the hard line is connected to the antenna. Mahtowa was back on as of Saturday at noonish. Randy Wabik – KR0B is going back to looking for the amplifier, etc. After getting the repeater back up we need to look at the generator for Mahtowa.

Testing:
Doug Nelson – AA0AW nothing planned until after the new Technician Syllabus comes out on July 1st. There are twelve (12) new tests that will be coming. If anyone wants to test before the new test get ahold of Doug. If anyone needs testing contact Doug at AA0AW@ARRL.net and they will test individually.

Education:
Bob Schulz – KC0NFB – nothing scheduled till the fall sometime around September. Looking at doing online again as well.

Motion to adjourn by Doug Nelson – AA0AW, seconded by Dave Davis – AA0AC, motion passed at 19:28 (7:28 pm)

June 9, 2022

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

Absent:
Second Year Board: Dave Davis – AA0AC
Chaplin:
Web Site: Thomas Dorr – KE0RHA
Newsletter/Historian: Kim Waller – KE0NQS
Newsletter/Historian: Steve Waller – KE0NQT

Meeting called to order at 19:04 (7:04 PM) by President Gene Ellefsen – N0VRM. Fifty-three (53) members in attendance.

Minutes:
Posted on the web page and in the newsletter. Motion to approve by Grant Forsyth – KC0WUP, seconded by Jeff Nast – KC0MKS, motion passed.

Treasurer's Report:
Checking: $1,469.28
Savings: $4,074.44
Repeater: $4,920.31
Subtotal Cash $10,464.03

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

Assets Subtotal: $12,194.45

Minus Checks Outstanding:
1447 Douglas County $260.00
Checks Subtotal: $260.00

Grand Total: $11,934.45

Continued on Page 5

No questions. Motion to accept as presented by Jeff Nast – KC0MKS, seconded by Scott Ahlgren – N0VYU, motion passed.
There were a couple of motions at the board meeting:

Donation of $1,200.00 to WDSE for the antenna. No questions are comments. Motion to accept by Bob Schulz – KC0NFB, seconded by Grant Forsyth – KC0WUP, motion passed.

Request for $100.00 for food for Field Day. Comment you spent $100.00 in the past, with the way prices of things are going up I think we should up it to $150.00. No additional comments. Motion to approve by Grant Forsyth – KC0WUP, seconded by Bruce Carlson – KN0NUL, motion passed.

Request for Repeater Use:
Sam Frey – KE0YTM wished to have the floor. July races we have Curnow and Voyager. If you could please assist with making these races go smoothly with communication. Curnow's is July 16th with a 9-hour time limit. Voyager is July 30th with four (4) aide stations. Voyager is a longer day, but you will not have to stay the whole time as they do shut the stations down.
Request for the use of Mahtowa Repeater for Saturday June 18th.
Many years ago, there was a blanket approved several events in the area. They were going to use our systems they just needed to give us a heads up so we were aware. MS is one of them.

Field day:
We will be holding this June 25th to the 26th at Spirit Mountain Parking Lot C. We are looking for people who are interested in learning how to operate HF. We are looking for participation to get on the air. Starts at 13:00 (1PM) Saturday to 13:00 (1PM) Sunday.

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

HamFest – We have started taking reservations for next year.

Testing:
Doug Nelson – AA0AW nothing planned until after the new Technician Syllabus comes out on July 1st. There are twelve (12) new tests that will be coming. If anyone wants to test before the new tests get ahold of Doug. If anyone needs testing contact Doug Nelson at AA0AW@ARRL.net and they will test individually.

Newly Licensed Hams:
The July meeting, we will have Rollie at the meeting to have new name badges made for all new hams that have not gotten one. The club will pay for your first name badge. If you are looking to replace your current name badge due to a call sign change or lose of old one it will cost $5.00. If you are interested in getting a badge made, please make sure to attend this meeting on July 14th.

Door Prize was won by Ben Harstad – KE0JDB
Motion to adjourn by Mike Lovold – N0PDG, seconded by Dave Pyrlik – K0DJP, motion passed at 20:15 (8:15 PM). Program Grandma's Marathon.

Prez Sez ...

Hi everyone,

Field Day: It came, we did it, and it's gone. To all those who came for set up, tear down, and came to visit, Thank You!! We had 3 Stations operating. Doug Nelson AAØAW setup a GOTA (get on the air) Station. He was doing CW and FT8 and had a few new Hams come and learn about digital mode. Gene Ellefsen NØVRM and Bob Schulz KCØNFB had a side band station operating. Last, but not least, Ray Wiles NØRCT, Al Nordin WBØDBQ and Pat Hayden KCØJRJ had a digital station with quite a light show during the evening. I think everybody there had a good time and some people had a good learning experience about operating HF radio!!!

The next Club event will be the Annual ARAC Picnic Sunday, August 7, 11:15 AM at Chambers Grove Park, which is located at the far west side of Duluth in Fond du Lac neighborhood. Follow Grand Ave then Commonwealth Ave (MN Hwy 23). The park will be on your right, before the bridge. There will be club-furnished brats, pulled pork, and corn on the cob. It is also a Pot Luck, so bring your favorite dish to share!!!

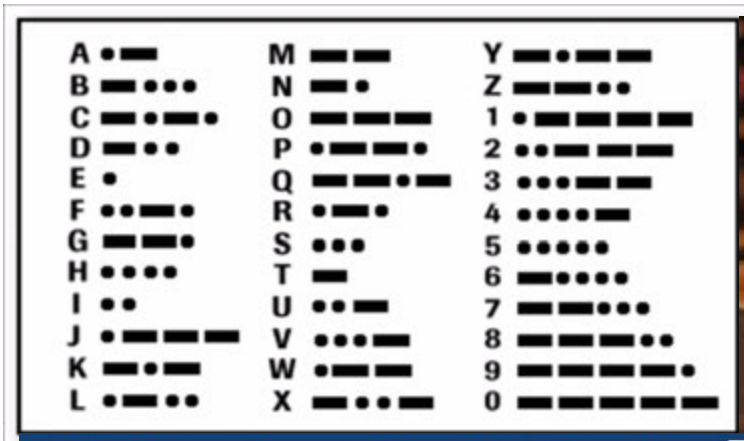
73, Gene Ellefsen NØVRM
Club President

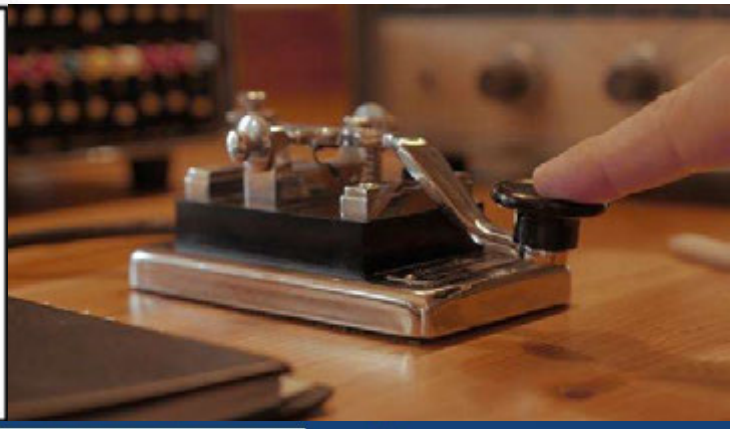
CLUB REPEATER
WØGKP

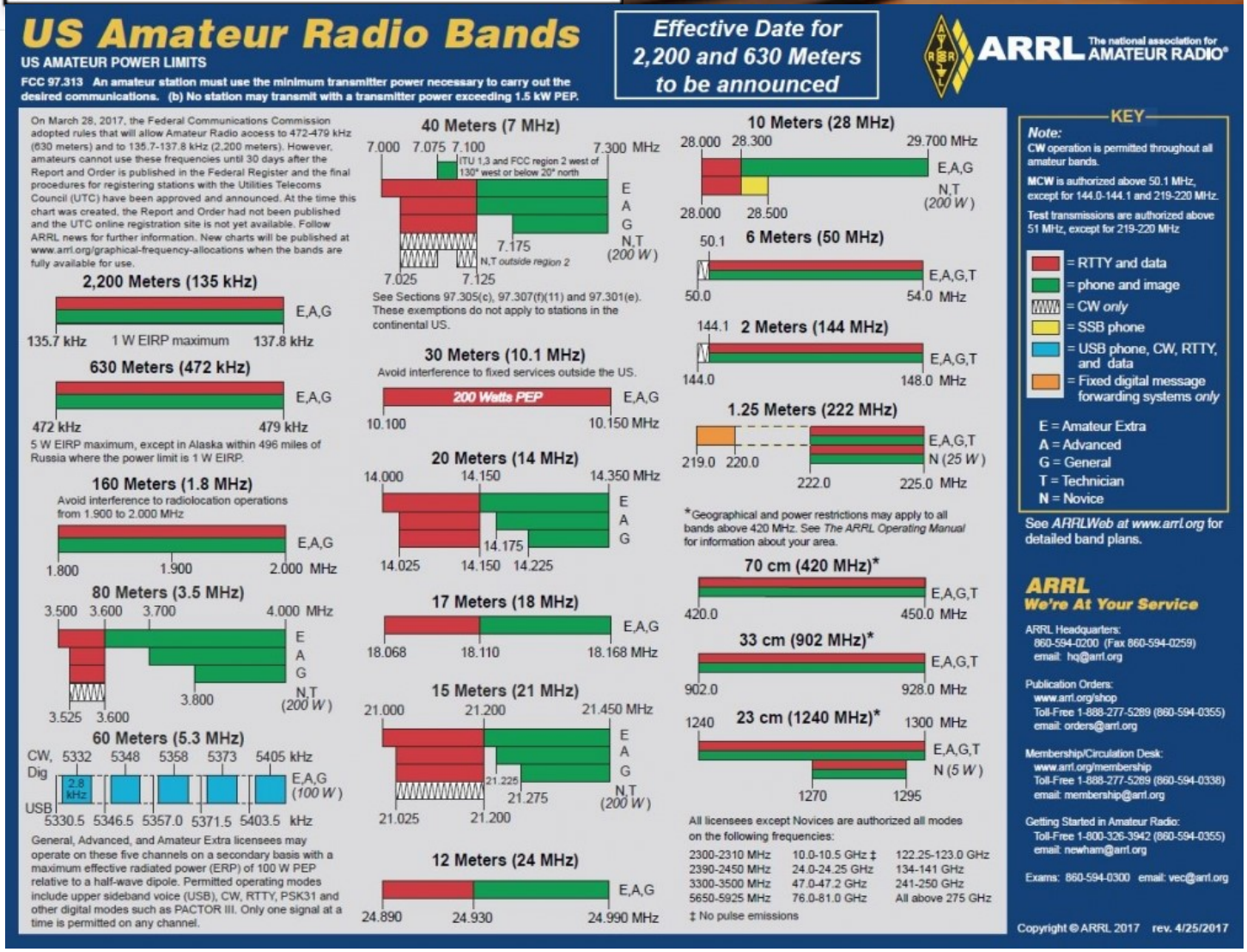
146.94 (-)
CTCSS TONE
103.5

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 Buzy?	QRU Have anything for me	
QRV Are You Ready?	QRX Standby	QRS Transit Slower	







NETS

Have a favorite HF/6m/2m/1.25m/7Øcm 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 2ØØØ on the ARAC repeater (146.940 MHz with a tone of 103.5 and standard offset).
- **Minnesota D-Star Net:** Sundays at 19:3Ø on Reflector 53A
- **Minnesota Section Net** 12ØØ and 173Ø on 3.86Ø [Net Manager: NØYR] http://www.mn-section.org/dept_stm.html
- The non-non-net: Evenings 2ØØØ 144.2ØØ USB except for Sunday evenings.
- Badger WX Net: Ø5ØØ-Ø715 on 3.985. Give 24 hour high/low/current temperature, precipitation and snowfall.
- **PICONET**: 3.925 from Ø9ØØ-11ØØ CT Mon-Sat and 16ØØ-17ØØ CT Mon-Fri. Info at: http://www.piconet3925.com
- Michigan Upper Peninsula Net: 16ØØ (CST) on 3.921 MHz Sun-Sat and 12ØØ Sun. Info: http://www.michupnet.com
- Great Lakes Marine/Maritime Mobile Net: Morning Ø7:3Ø - 3.932; Ø8:15 - 7.261 MHz and evening 18:3Ø - 3.173Ø927; 19:15 - 7.268 MHz. Weekend extra net: 1Ø:ØØ - 7.261/7.268 MHz. All CST, LSB and +/- QRM. See: http://www.sailblogs.com/member/glmmnet/
- MIDCARS: Ø7:3Ø-13:ØØ - 7.258 MHz. See: http://www.midcars.net
- Iowa snowbird net on 14.257MHz, M-W-F at 1Ø:ØØ am Local Time. This is an open net.
- Spider Web Net (Marco Island FL) on 14.347 every morning at Ø73Ø CST/CDT: http://www.spiderwebnet.net
- Maritime Mobile Service Network: Daily at 11ØØ—21ØØ Central on 14.3ØØ. http://mmsn.org and http://www.143ØØ.net
- RV Radio Network: Every day at 19ØØ Central on 7.265 MHz. Web site: http://www.rvradionetwork.com
- Upper Midwest Ten Meter Net: Every Thursday Evening @ 8 PM – 28.48Ø 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 – 28.48Ø MHz USB
- Hobby Helpers Net - Tuesday @ 8 PM – 28.33Ø MHz USB (Isanti MN) LSB [Net Manager: WOØA].
- Northstar Trader Net: 3.9Ø8 +/- at Ø83Ø CST Sundays
- WARFA: 3.9Ø8 +/- Sun/Tue/Thu nights at 22ØØ CST, http://warfa.org/
- Youth Net: 14.32Ø-1433Ø Sundays 18ØØ-19ØØ UTC, Net Control: AC8PI
- YACHT: Saturdays 19ØØ CST on EchoLink #481872, http://yachthams.webstarts.com
- Northwestern Ontario ARES Net: Evenings at 2Ø:15 (Central) on +/- 3.75ØMhz
- The Iron Range Net: Saturdays at Ø8ØØ Central time on or near 3.919 Mhz. Look them up on Facebook!
- FORX Net: Mondays at 19ØØ Central at 3.941 Mhz +/- QRM. WAØJXT — Grand Forks, North Dakota
- HF CW: Fridays Ø8:ØØ CST, 7.112 MHz. Informal slow speed CW Net. W8IRT NCS. Email: w8irt@aol.com
- Minnesota ARES Digital Net: Thursdays at 2ØØØ CST, 3.5835 MHz USB +/- QRM, Mode: Olivia 8/5ØØ.
- SARA Digital Net: Sundays at 19ØØ Local, 3.582.15Ø MHz USB +/- QRM, Mode: BPSK31/BPSK63
- Spider Web Net (Marco Island FL): 14.347 every morning at Ø73Ø CST/CDT: http://www.spiderwebnet.net
- Broadcaster Net: 7.231 or 3.855 M/W/F @ 15ØØ UTC. 14.255 M-F @ 213Ø UTC. http://www.cbsretirees.com/ham.htm
- Old Military Radio Net: 7.268 +/- nightly at Ø2ØØz. Other times/Frequencies too. See: http://www.mrca.ar88.net/
- Rag Chew Crew/Tailgaters/Freewheelers Nets: 3.916 +/- nightly at 19ØØ CST, http://www.tailgatersnet.com
- North South Net: 7.214.6 +/- at Ø7ØØ CST, Monday-Saturday

UPCOMING EVENTS

Next ARAC Board Meeting

Tuesday, July 5, 2Ø22
@ 6:30 p.m.
Sammy's Pizza - Spirit Valley

Next ARAC Club Meeting

Thursday, July 14th
7 p.m.
Coppertop Church!

Program:

Doug Nelson
AA0AW

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

Contact us at ke0nqs.mn@gmail.com

LOOKING
for an
Amateur Radio License
TESTING SESSION?

No need to wait for a class!

Schedule your own Testing Session TODAY!

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

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)

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 / ɛl-mər/ [el-mer]
1. a male given name: from Old English words meaning “noble” and “famous.”
2. an adhesive used to bond like or unlike materials
3. An experienced ham radio operator who mentors new and prospective hams.

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

Membership E-mail Directory

Ahlgren, Scott **NØVYU**
sahlgren01@msn.com
Anderson, Jim **NØJWA**
kcØmko@centurylink.net
Anway, Allen **KC9LJN**
allen@a2d2.com
Bakke, Richard **KDØQHE**
rabakke46@aol.com
Barnes, Ray **KEØZN**
KEØZN@outdrs.net
Blodgett, Warren **KDØXI**
kdØxi@aol.com
Blotti, Nick **KBØMHD**
NickBlotti@hotmail.com
Bockbrader, Jonah **KEØCXD**
j@pelirrojo.ninja
Bockbrader, Rollie **KBØCK**
Rollie.bockbrader@q.com
Clemens, Butch **KBØSMG**
kbØsmg@2z.net
Currier, Barb
bjcurrier@peoplepc.com
Dall, Jim **WDØGVW**
Dall, Teresa **KAØCDO**
wdØgvw@gmail.com
Dallavia, Paul **KCØWDQ**
kcØwdq@yahoo.com
Daly, Ed **KØYMF**
eddalymn@aol.com
Ellefsen, Gene **NØVRM**
lspitech@mail.com
Ferch, Tim **AKØTF**
akØtf@aol.com
Ferguson, Tom **WBØDHB**
tferg5@msn.com
Fleischman, Bill **KCØZZL**
wfleisch@d.umn.edu
Forsyth, Grant **KCØWUP**
forsythgrantc@gmail.com
Frederick, Jerry **NØBNG**
nØbng@mchsi.com
Frederick, Julie **NØPIE**
jfreds@mchsi.com
Gibbs, Rex **NØKXT**
nØkxt@yahoo.com
Godbout, Med **WØEEZ**
wØeezmedgodbout@centurytel.net
Gordon, Fritz **KD9BEW**
wizzard7@hushmail.com
Hanson, Gary **NUØW**
captaingary@chartermi.net
Harstad, Ben **KEØJDB**
coast_guard_aux_duluth@yahoo.com
Hawkinson, Garry **WØELH**
garryhawkinson@yahoo.com
Hegrenes, Bruce **KØOE**
Hegrenes@charter.com
Jakubek, Patrick **KDØSGK**
kdØsgk@gmail.com

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

Johnson, Randy **AAØME**
randy@nsw4x4.com
Leslie, Shirl **KBØSBM**
dsleslie@centurytel.net
Maida, Tom **KFØALP**
tmaida@outlook.com
Makowski, Cletus **KBØLBS**
kbØlbs52@msn.com
Makowski, Karen **NØWEZ**
k-wez1@hotmail.com
Marchetti, Jim **KEØLHX**
KE0LHX@outlook.com
Mattson, Bing **KCØKRA**
, Kathy **KCØTIV**
HamToHam@msn.com
McCorison, Derek **WØDNF**
derek1Ø68@hotmail.com
Meese, Joe **WØLWU**
rxcpd@yahoo.com
Miller, Dave **WØNWO**
dmiller@nwoutlet.com
Mullozzi, Anthony (Nick) **KDØYQA**
AJ **KDØYPZ**
Ben **KDØYQB**
Joe **KDØYQC**
amulloz@hotmail.com
Murray, Edwin **W1ELM**
w1elm@arrl.net
Nast, Jeffrey **KCØMKS**
kcØmks@gmail.com
Nelson, Doug **AAØAW**
aaØaw@chartermi.net
Nelson, Glen **KAØGGG**
mgnelsonØ1@gmail.com
Nelson, John **KBØSUW**
jon275@q.com
Nordin, Al **WBØDBQ**
anordin@aol.com
Olson, Lloyd Jr. **KC9JTC**
kc9jtc@yahoo.com
Pearson, Wayne **WØKRH**
meppsy@netzero.net
Pettit, Kathy **KCØYVM**
kcØyvm@gmail.com
Pomroy, Deb **KCØUKC**
dpomroy@d.umn.edu
Pyrlik, David **KØDJP**
David.pyrlik@gmail.com
Reger, Bernard **KB9KQZ**
Mike **KB9KRA**
Brian **KB9KUX**
Chris **KB9WJQ**
bjr5488@yahoo.com
Rosell, Dawson **KEØHEL**
rosel032@d.umn.edu
Saunders, Diane **KØDSL**
kØdslae@gmail.com

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

Scholz, Greg **KDØUYN**
kdØuyn@gmail.com
Schreyer, Dave **WAØAWZ**
wa0awz@gmail.com
Schulz, Robert **KCØNFB**
kcØnfb@charter.net
Snyder, Mark **ACØLE**
snyds1118@msn.com
Stark, John **KCØYVH**
johnvinyl@yahoo.com
Swanson, Scott **N9DMG**
sswanson6749@charter.net
Waller, Kim **KEØNQS**
keØnqs.mn@gmail.com
Waller, Steve **KEØNQT**
keØnqt@gmail.com
Whelan, Jacqui **KBØJIM**
cndymx@gmail.com
Whelan, John **KØJRW**
jr-whelan@hotmail.com
Winterscheidt, Heinz
KD6FSA
alter.skipper@gmail.com
Wulf Gar **WU1FGR**
wu1fgr.ham@gmail.com

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

SUNDAY NIGHT NETS
193Ø - **CW - 28.125 MHz USB-CW**
2ØØØ -**USB 28.45Ø MHz**
21ØØ - **Southern St. Louis County Emergency Services Net**

MONDAY NIGHT NETS
2ØØØ- **Northland WX Net -** ARAC Repeater

JULY
CLUB EVENTS

TUESDAY NIGHT NETS
2ØØØ -**Douglas Cty 145.49Ø MHz**
2Ø3Ø -**Central Carlton County**

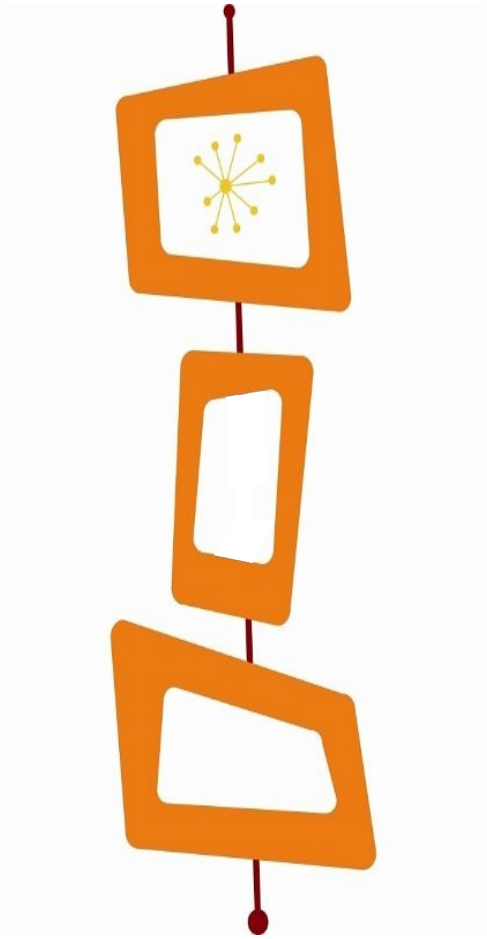
WEDNESDAY NIGHT NETS
19ØØ -**Lake County - LSAC1**
2nd & 4th Wednesdays
21ØØ -**BWAR**

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3 CW 1930 NØPDG USB 2000 WØLWU ES 2100 NØVRM	 WX 2000 KCØMKS	5 **ARAC BOARD MEETING** **Sammy's Pizza** **6:30 pm** DC Net 2000 CC Net 2030	6	7	8	9
10 CW 1930 AAØAW USB 2000 K9KDK ES 2100 N9DMG	11 **DC ARES/ RACES Mtg 1900 DC EOC** WX 2000 KCØMKS	12 DC Net 2000 CC Net 2030	13 **Lake County ARES/RACES Meeting 1800** Lake County Net 1900 21ØØ -**BWAR**	14 **ARAC Club Meeting** **Coppertop Church** **7:00 PM**	15	16
17 CW 1930 NØPDG USB 2000 NØVRM ES 2100 AAØAW	18 WX 2000 KCØMKS	19 DC Net 2000 CC Net 2030	20 **St Louis County ARES/RACES Meeting 1800** 21ØØ -**BWAR**	21	22	23
24 CW 1930 AAØAW USB 2000 NØPDG ES 2100 KCØWDQ	25 WX 2000 KCØMKS	26 DC Net 2000 CC Net 2030	27 Lake County Net 1900 21ØØ -**BWAR**	28 **Carlton County ARES/RACES Meeting** **1900 CC EOC**	29	30 **ARAC Club Breakfast** **The Chalet** **4833 Miller Trunk Hwy** **Hermantown, MN**
31 CW 1930 NØPDG USB 2000 AAØAW ES 2100 WØNWO						

Get this newsletter *faster* via email!
Email Doug AAØAW at
aaØaw@arrl.net

Next Meeting: Thursday,
July 14th, 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

National Contest Journal at www.ncjweb.com

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

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

QRZ web site at www.qrz.com
VHF Propagation site at www.aprs.mountainlake.k12.mn.us

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

FOR SALE

FOR SALE by KØGX

Electronix Servicing
890 209th Lane NW Oak Grove, MN 55011
763-561-2836 kØgx@comcast.net

SPECIAL DISCOUNTED GOOD GUY PRICING

RF2K + GERMAN SOLID STATE
1500 WATT H.F. AMPLIFIER

2-BLF 189XRA LD MOS DEVICES Each Rated at 1900 Watts

Frequency Range . . . 1.8-30 + 50-54 MHz

RF Output . . . 1500 Watts at 240VAC

Built-in Auto Tuner . . .7" Touch Screen . . . Quiet Fans

$3195.00

2. AMERITRON ALS-600/PS600	Solid State Amplifier 10-160m 600w	$1275.00
3. DENTRON CLIPPERTON-L	HF Tube Amplifier 10-160m 1200w	$650.00
4. ICOM IC-706	Mobile Transceiver 2 Meter/HF 10-160m 100w	$475.00
5. ICOM IC-735	HF Transceiver	$375.00
6. ICOM IC-2340H	Dual Band Mobile Transceiver UHF/VHF	$150.00
7. ICOM IC-718	HF Transceiver 10-160m 100w	$475.00
8. ICOM IC-7200	HF/VHF/UHF Transceiver 6-160m 2m 70cm	$525.00
9. ICOM IC-751	HF Transceiver 10-160m 100w	$475.00
10. DRAKE TR-4C	HF Transceiver	$375.00
11. ALINCO DX-70	HF Mobile Transceiver 10-160m + 6m	$350.00
12. KENWOOD TS-430S	HF Transceiver 10-160m 100w	$325.00
13. BIRD 4300-400	Peak Reading Kit for BIRD 43	$55.00
14. YASEU MD-100	Desk Microphone	$95.00
15. MFJ-9020	20M QRP CW Transmitter	$99.00

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

Ham Radio Kayaking, continued from page 1

Photography, or ham radio equipment with you, an array of sporting/fishing kayaks are available with ample space for your gear. If you'd rather not bother paddling, you can even buy models with a 12-volt motor that combines with foot brace steering for hands-free operation. Pretty "snazzy". *Editor's note: For those among us unfamiliar with that formerly popular term, it means "stylish and attractive".*

OK, maybe the idea of combining kayaking and ham radio seems at little odd at first. Well it turns out that quite a few of our fellow hams are extoling the benefits of such outings, whether solitary or in a small group. Blogs, forums, Facebook pages and YouTube videos show amateur radio operators who love the beauty and serenity of kayaking choosing to mount a mobile station on their kayak, or kayaking with their equipment to set up a remote station on another shore.

One such enthusiast, Richard Johnson AE3C from Pittsburgh, PA wrote an extensive article, Amateur Radio/Kayk Operations: Tips Tricks, & Stories. It's archived on his blog at http://www.pgh-net.com/ae3c/kayak.html Though some of the equipment he uses is older now, it's still a very relevant guide. He prefaces his advice with these comments:

"Operating Amateur Radio from a kayak is a real challenge both technically as well as an operationally. The open water brings not only the usual concerns of weight, power, antennas, matching, and lightning, but also the special problems of possible submersion of operator and equipment, the need to be concerned about the balance of the antenna vis-à-vis the kayak, the effects of splashing, rocking, and wakes from unconcerned stink-pots, and entry & exit problems for operator and radio.

"Even with the extra obstacles, operating from a kayak also offers unique rewards. Being away from rush and hub-bub of society, the QSOs can be relaxed and unhurried. Audio is usually cleaner and easier to hear (the FCC rules prohibit music in the background of Amateur transmissions, but how about birdcalls?), except when traversing rapids. The antenna, if well mounted, is elegant, and a beautiful addition to the appearance of the kayak. And, the whole setup attracts riveted attention not only to Amateur Radio, but also to kayaking. Kayaking, of course, is both a whitewater as well as flatwater sport. On flatwater, say, in a secluded cove or river bend, the sense of serenity and solitude is sublimely soothing…"

KD6JUI of Dixon, California paddles a serene lake

Rick goes on to discuss the importance of considering the weight of your kayak and your amateur radio equipment, advising that your station and case total no more than 10 pounds. He also speaks of becoming familiar with maintaining balance while in the kayak, as well as learning to enter and exit your kayak smoothly. He describes the 2 ways to enter/exit a kayak with your station.*Sidenote: Unless you are a very seasoned kayaker who is accustomed to loading and offloading extra equipment on excursions with ease, we recommend practicing entering and exiting your kayak with a dummy load of the same weight as any valuable equipment you plan to bring. Then practice paddling and moving from side to side a bit to under-*

Continued on Page 16

stand the range of sideways rocking or sway your kayak has. Kayaks have quite a range of motion before they actually capsize, so become accustomed to how yours feels with roll and balance. Entry/ Exit advice from Rick:

AE3C's Kayak Entry/Exit Approaches

"There are two basic approaches to take...

1. When entering kayak from the edge of a ship or dock
"Here, handling the Station is easier, but actually getting yourself into the craft is more challenging. The problem is, simply stated, that while the operator is entering or exiting from the kayak, the center of gravity is too high, and the combination of operator and craft is extremely unstable. Thus, the process is really either a quick and controlled fall into the vessel, or a quick hop & jump out.

"Since this is without question the most likely moment for a capsize, obviously **the Amateur Station (except the less valuable fish poles & dipoles) should be left on the dock or vessel, within easy reach of the Operator after entry.**

2. When entering kayak rom the riparian shoreline, of lake or river
"Things are much easier with the exception that you get your feet wet. After setting the kayak parallel with the shoreline, **put the Amateur Station inside the kayak, between the foot pedals, so that you can reach it after boarding.** It is very difficult to reach equipment stowed behind the seat in a kayak, and so, everything has to fit in the narrow opening between your knees and the portal. Exit is simply the reverse, and both entry & exit this way is extremely stable."

AK1NS of Hicksville, NY, Rigged and ready to go

OK, as for setting up your station once you've successfully entered your kayak, AE3C gives a very detailed guide:

Antenna Deployment
"Deploying the aerials is both the most challenging as well as the most fun part. Of course, the variety in aerials is one of the things that gives our hobby great interest, being fundamentally more art than science. Let's look at a few favorites.

"For Two Meters and above (or is it below?), of course we will probably use flexible J-Poles and Jagis supported by fiberglass fish poles. The antenna is taped, tied, or wrapped to the appropriate sized collapsible fish pole, and fed with coax and a simple 1:1 coax loop rf choke balun.

"Or, the J-Pole can be directly fed with twinlead, if the length of the twinlead feedline is exactly a multiple of wavelength compensated for the velocity factor because the antenna's impedance will be exactly reflected at every wavelength (and half -wavelength) multiple. The fish pole is then set in a screw-mount rod holder alongThe fish pole is then set in a screw-mount rod holder along the

Continued on Page 17

hatch gunwale. Very simple, and highly effective.

“For directivity, the second fish pole with a lambda + 5% reflector (or a lambda - 10% director) spaced at approximately 1/10 wavelength from the J-Pole makes a quick and dirty Jagi. Just remember that the parasitic element will change the antenna's impedance. Closer element spacing will increase gain and front to back ratio, but will lower impedance and bandwidth. This will require either an adjustment to the feedpoint of the J-Pole or some very careful fiddling with the feedline length. Use an antenna analyzer onboard on a calm and quiet day to find these exact dimensions.

“The AE3C Jagi uses the two fish poles set upon brackets which are affixed to the deck of the kayak with double-sided tape. The operator's higher impedance J-Pole (described in detail below) is on one fish pole; the slightly longer reflectors is on the other fish pole. The two aerials are aligned at the top of the fish poles, and the two fish poles are tied together at the top at 1/10th lambda (about 8 -10 inches), giving the Jagi an overall arch. Of course, there is a slight misalignment because the J-Pole and the Reflector are not at a uniformly equal spacing, but the elegance of the combined arches makes for one of the more beautiful Amateur aerials of all.

“For Six Meters and lower (or is it higher?), dipoles and loaded dipoles are more than likely our antenna of choice.

“For 6-20 meters, we use carefully tuned dipoles. At 20 meters, a quarter wave leg will be about 16 1/2 feet, and this is the practical maximum for a full sized kayak dipole. Also, collapsible fishing rods in this length are easy to find, inexpensive, very lightweight, and sturdy.

“Over the years, we've all learned that for resonance, efficiency, Q, matching, and "elegance" (both scientific and aesthetic), little competes with a well engineered and well tuned dipole. These factors make the dipole the ruler of the skies above and around the kayak.

“For 160-30 meters, we have to compromise. We can either use loading coils or a tuner. I'll not enter this debate too far, other than to say that coils seem to work fine on 30 & 40, but that a tuner and a loop arrangement might be a better choice for 80 & Top Band. The coils or tuner both add weight, but both in about the same amount. The loop (Delta Loop configuration) extends from the operator, then out one pole, across to the other, then back to the Operator.

Photo Credit: Paul Havlik WD9IOK of Lascassas, TN

“For 30-40-80-160 Meters, the basic idea is to get as much wire as high as possible, and to feed through an antenna tuner. Onboard the kayak, this is easier said than done. Traditional techniques such as rocks, slingshots, string, and trees are out of bounds, because it is much too dangerous for a kayak to be tethered from on high. In an emergency, which can occur within an

Continued on Page 18

instant on the water -- such a tether can mean severe injury or death.

“Two viable alternatives are the Delta loop deployed by the fish poles, and the coiled telephone handset cord. Patching three 25-foot coils together (one on each fish pole, and the third atop and between -- all connected together, of course) gives you quite a bit of wire. Tune the best you can; you'll be surprised at the performance.

“The configuration of the dipoles depends mostly on wind and water conditions, and can range from an inline dipole supported above the Operator by a few feet of pvc, to various Ls or Vs (L and V configurations are still essentially dipoles).

“For kayaks equipped with rudders -- most flatwater kayaks are -- another elegant solution is to use the rudder cables as the horizontal leg of an L-dipole (I resist the use of the term "counterpoise" because the horizontal leg is an integral part of the antenna just as much as the aerial is; it is not an afterthought).

“If you're lucky, your rudder cable will be a usable length. Because the cable is inside the kayak, it may be possible to lengthen it (in front of the pedals) just by adding a little wire. But remember that the footpedals & bracket (in front) and the rudder & rudder mount (out back) will act as capacitative plates or "hats" to the antenna, loading the cable. Use your antenna analyzer, on the water, and experiment to find whether the natural resonant frequency (or as modified by wire extensions) can be massaged into your desired band. If not, you may still be able to use the cables with the ATU, but quite frankly it is far more fun to deploy the fish pole aerials.

“And don't forget to add appropriate flags, streamers, and maybe even a call-sign banner to the aerials. Remember, we are all Ambassadors for our hobby. A kayak equipped with an Amateur Radio Station is an especial attention-getter, and is a particularly unique opportunity to promote both passions.

“Now back to our aerials. Construction of the dipoles is simple and straightforward, using minimalist materials, i.e., string, fishline, plastic cable ties, pvc, off-the-shelf rod holders, and lightweight stranded wire. Feedline is coax or measured twinlead, connected directly to the PL-259.

Door County Amateur Radio Club W9DOR on a beautiful day in Sturgeon Bay, WI

“Stow the fish poles collapsed behind your seat. An old trick making reaching the things that are behind you easier is to ***tie color-coded string or cord to the items you expect to need. Tie the strings to the poles and keep them along the outer edge of the seat, trying your best to avoid tangles.*** Even so, expect difficulty in retrieving things that are behind you in a kayak.

Continued on Page 19

“Extend the fish poles, choose your pre-cut dipoles from separately marked reclosable plastic bags (one dipole per bag), and attach the legs.

“After the fish pole are "baited," affix them to their attachments. You can use fishing rod holders, plastic flag holders (attached to the deck with double-sided tape), a pvc "tee," or anything else you can imagine.

“Orientation of the dipole legs is largely a matter of artistic skill and personal preference. Be wary that the rudder cables could convert your HF deployment into an NVIS system. Remember the AE3C saying, "enjoy and deploy," and if deployed in the presence of an audience -- as will usually be the case -- should be performed with great aplomb.

Equipment Deployment
“Your rig, microphone, key, and cables will all be separately sealed in appropriate-sized waterproof plastic bags, which themselves are in another waterproof "dry bag." When you pack, leave as much air as possible in the bags; never squeeze out the air to "save space." The reason for this is that air, should the kayak capsize, will keep the equipment afloat, maximizing the chances of recovery.

“Although excellent for other situations, hard cases are not ideal for /kayak operations (but see below for a notable exception). The rigid structure cannot be "massaged" into the tight spaces inherent in the kayak. That, combined with the fact that most (but not all) hard cases either leak or will not float, makes them undesirable.

“Once unwrapped, return the bags to the dry bag, to keep them dry. The rig should be attached just below the deck, directly in front of the operator, away from the sun and splash, and attached with bungee cords.

“An alternative is to hold the rig between your knees, but this is a significant problem if you suddenly need to paddle away from something; the rig can interfere substantially.

“Another alternative is Velcro, with the smooth strips glued inside the deck near the operator, and the rough strips on straps securing the radio from below to the underside of the foredeck. This method favors light rigs like the FT-817, and is marginal for larger rigs like the SGC-2020.

“Use just enough coax or twinlead feedline to reach the feedpoint. The microphone can safely sit in your lap, and the key can be affixed with double-sided tape to the deck.

Power Considerations
“This is a broad subject, but begin with the obvious. Use the lightest battery for your needs. The FT-817 has sufficient internal power for a few hours of kayak operations, but will need more power for a whole day. For a multi-day expedition, a recharging system either overnight or while in the sun is a must. While solar cells can certainly be attached to the kayak deck, and batteries can be rotated, we are now at the very fringe of what a solar powered kayak recharging station can accomplish.

Antenna Tuning & Matching
“Here is another area that gives Amateurs both endless pleasure and challenge: matching and tuning the aerial. For our J-Poles, Jagis, and dipoles, we can spend endless hours tuning them and matching impedance. Since we will by design be operating QRP, every bit of effort which coaxes a few more milliwatts out from the antenna matters.

Continued on Page 20

Ham Radio Kayaking, continued from page 19

“Tuning the J-Pole, Jagi, and dipoles should be performed onboard the kayak. Choose a day when you are not stressed or pressured, and paddle away from shore. Find a location typical of where you plan to operate, and wait for calm seas and conditions. While everything can be accomplished simply by tuning for noise, then tweaking for vswr, a good quality antenna analyzer makes the chore at least seem more scientific, even though we all know it is more experience and craftsmanship.

“Use the AE3C approach, which is summed up in the expression "tuning is pruning, and matching is patching." J-Poles are tricky, especially without a choke, because the feedline affects both tuning and impedance. Jagis vary impedance wildly with element spacing (closer spacing increases gain & front to back ratio, and lowers impedance & bandwidth), and the feed point impedance increases as you move away from then shorted end.

“Think of the J-Pole as a half wave radiator matched with a quarter wave section and fed by tap near a shorting stub.

Twitter Photo Credit: @AmateurRadioUSA

“To obtain a good impedance match with twinlead, the feedpoint should be about 1.25 to 1.50 inches from the short; the quarter wave parallel matching section should be about 0.22 wavelength (accounting for the "k" factor at about 0.975), bringing the total length of the aerial to about 0.73 wavelength. This translates to these dimensions:

“Stub Quarter Wave Parallel Match Half Wave Radiator
_____()_____
|_____()_____________________________
|-1.40"-|-17.57"-------|
|-----------------55.77"-----------|

“When adding a director or reflector to the J-Pole, creating a Jagi, since the parasitic elements lower the impedance, we will need a second J-Pole fed slightly farther away from the stub, say 1.85 to 2.20 inches, raising the impedance of the J-Pole and thereby matching the Jagi to 40-50 ohms. And remember, J-Poles and Jagis require a 1:1 coax loop rf choke balun (e.g., four turns of RG-58U coax in a four inch diameter - not critical) to prevent the feedline from acting as part of the antenna. This choke, if properly designed, can serve double duty as a beverage holder, faux fishing reel, or as a steamer attachment point. Be patient, and enjoy the challenge!

“Dipoles and their variants (Vs & Ls) are much more straightforward. A few basic principle to keep in mind are:

* To raise the impedance of a resonant dipole, either in a linear configuration or non-linear such as Vs & Ls, move the feedpoint slightly off-center.

Continued on Page 21

* Remember that wire antennas should be cut slightly longer than rod or tubular elements.

* Wire antennas will have, in general, slightly higher impedance, higher Q and lower bandwidth than rod or tubular elements.

Operating
"A well-designed Ham Shack considers several factors, such as grounding, lightning protection, equipment layout & access, a precise timepiece, prefix lists, gridsquare & azimuthal projection vector maps, deskspace for logs, and operator ergonomics.

"The same factors should be a consideration in design and deploy of any Amateur field or "/p" (portable) Station. For a typical Field Day setup, grounding and lightning protection are of primary concern, and the same is certainly true for "/kayak" operations, and the technique is very simple. Should the possibility of lightning appear -- however remote -- then "ground" the watercraft without hesitation or delay. And by this, I mean get out of the kayak and onto the ground, and fast Lightning and kayaks have a strong mutual attraction, and a kayak with aerials is just about irresistible to lightning, with deadly and tragic results. Do not use a kayak when the possibility of lightning exists.

"Other than that, there is no practical way to ground a kayak; we skirt the resultant noise and static problems by operating while still or while drifting. Movement by the kayak through the water produces a surprising amount of static, and the traditional approach of trying to match the non-metallic kayak to ground by dragging a trailing wire behind (actually creating little more than a resistive load drawing off precious rf) is just too dangerous; should the drag line get caught on a log or on anything, this could mean an instant capsize for the kayak.

"More can be done about equipment layout. Safety demands that the paddler / operator at all times have instant access to the paddle and footpedals, so the Amateur Station should be placed where it will not impede emergency operations of the kayak.

"Items are traditionally secured the deck of the kayak by small metal eyelets glued or epoxied to the surface to which are then attached elastic cords, which in turn hold gear such as emergency paddles, maps, and other ready access items.

"The elastic cords are perfect for securing the Amateur Station. In an automobile, it is unthinkable to use bungee cords to hold ham radio equipment, because in an accident, the cords will likely break, allowing the ham equipment to become a potentially deadly projectile. In the kayak, no such thing seems possible.

"With the rig secured by elastic, and the key taped onto the deck, and the papers, in map cases, can be held on deck with more elastic.

Stowing Temporarily
"On many occasions, we will need to stow the Amateur Station quickly and securely. Emergencies and dangerous situations develop incredibly rapidly on the water, and the operator must deal with the situation or potential situation "swiftly and severely." Part of this response will be to stow the Station as quickly as possible, to enable whatever maneuvering may be required.

"The operator should have several strategies or contingencies thought out and practiced beforehand, as a measured response.

Continued on Page 22

Ham Radio Kayaking, *continued from page 21*

"For example, a simple response might be simply needing to effect a few paddle strokes to avoid an object or to orient the kayak to an oncoming wake. Here, there is no need to stow the whole Station and Aerial; instead we would just stow the mic or key, and protect the rig from splash.

"If we need to paddle a little farther, in response to wind, strong current, or just to relocate around the bend, we might stow the rig but not the aerial. If we need to traverse low hanging branches, we might need to stow the aerials but not the rig. And if we're ready to move across the lake, we might stow the whole Station.

"A temporary stow might be as simple as putting the stowed gear in waterproof bags (remember, leave the air in).

"Like anything else, practice, practice, practice…"

Great advice for seasoned kayaking hams and newbies alike!
Our thanks to **Rick Johnson AE3X** for permission to reprint a portion of his article. View Rick's full article archived on his blog at **http://www.pgh-net.com/ae3c/kayak.html**

Do you have a ham radio kayaking story or comments to share?
We'd love to publish it, along with any photos you have, in an upcoming Relay! Contact us at **ke0nqs.mn@gmail.com** with your content.★

Twitter Photo Credit: Jim Netwal W9UUM, Onalaska, WI

Contest Calendar - July 2022

+ RAC Canada Day Contest	0000Z-2359Z, Jul 1
+ QRP Fox Hunt	0100Z-0230Z, Jul 1
+ NCCC RTTY Sprint	0145Z-0215Z, Jul 1
+ NCCC Sprint	0230Z-0300Z, Jul 1
+ K1USN Slow Speed Test	2000Z-2100Z, Jul 1
+ Venezuelan Ind. Day Contest	0000Z-2359Z, Jul 2
+ NZART Memorial Contest	0800Z-1100Z, Jul 2 and 0800Z-1100Z, Jul 3
+ DL-DX RTTY Contest	Cancelled for 2022
+ TA VHF/UHF Contest	1200Z, Jul 2 to 1200Z, Jul 3
+ Marconi Memorial HF Contest	1400Z, Jul 2 to 1400Z, Jul 3
+ Original QRP Contest	1500Z, Jul 2 to 1500Z, Jul 3
+ PODXS 070 Club 40m Firecracker Sprint	2000Z, Jul 2 to 2000Z, Jul 3
+ K1USN Slow Speed Test	0000Z-0100Z, Jul 4
+ ICWC Medium Speed Test	1300Z-1400Z, Jul 4
+ OK1WC Memorial	1630Z-1729Z, Jul 4
+ ICWC Medium Speed Test	1900Z-2000Z, Jul 4
+ RSGB 80m Club Championship, CW	1900Z-2030Z, Jul 4
+ ARS Spartan Sprint	0100Z-0300Z, Jul 5
+ Worldwide Sideband Activity Contest	0100Z-0159Z, Jul 5
+ ICWC Medium Speed Test	0300Z-0400Z, Jul 5
+ RTTYOPS Weeksprint	1700Z-1900Z, Jul 5
+ Phone Weekly Test	0230Z-0300Z, Jul 6
+ A1Club AWT	1200Z-1300Z, Jul 6
+ CWops Test	1300Z-1400Z, Jul 6
+ Mini-Test 40	1700Z-1759Z, Jul 6
+ VHF-UHF FT8 Activity Contest	1700Z-2000Z, Jul 6
+ Mini-Test 80	1800Z-1859Z, Jul 6
+ CWops Test	1900Z-2000Z, Jul 6

Continued on Page 24

Contest Calendar - July 2022, Continued

+ Walk for the Bacon QRP Contest	0000Z-0100Z, Jul 7 and 0200Z-0300Z, Jul 8
+ CWops Test	0300Z-0400Z, Jul 7
+ CWops Test	0700Z-0800Z, Jul 7
+ RTTYOPS Weeksprint	1700Z-1900Z, Jul 7
+ NRAU 10m Activity Contest	1700Z-1800Z, Jul 7 (CW) and 1800Z-1900Z, Jul 7 (SSB) and 1900Z-2000Z, Jul 7 (FM) and 2000Z-2100Z, Jul 7 (Dig)
+ SKCC Sprint Europe	1900Z-2100Z, Jul 7
+ QRP Fox Hunt	0100Z-0230Z, Jul 8
+ NCCC RTTY Sprint	0145Z-0215Z, Jul 8
+ NCCC Sprint	0230Z-0300Z, Jul 8
+ K1USN Slow Speed Test	2000Z-2100Z, Jul 8
+ IARU HF World Championship	1200Z, Jul 9 to 1200Z, Jul 10
+ SKCC Weekend Sprintathon	1200Z, Jul 9 to 2400Z, Jul 10
+ QRP ARCI Summer Homebrew Sprint	2000Z-2300Z, Jul 10
+ 4 States QRP Group Second Sunday Sprint	0000Z-0200Z, Jul 11
+ K1USN Slow Speed Test	0000Z-0100Z, Jul 11
+ ICWC Medium Speed Test	1300Z-1400Z, Jul 11
+ OK1WC Memorial	1630Z-1729Z, Jul 11
+ ICWC Medium Speed Test	1900Z-2000Z, Jul 11
+ Worldwide Sideband Activity Contest	0100Z-0159Z, Jul 12
+ ICWC Medium Speed Test	0300Z-0400Z, Jul 12
+ RTTYOPS Weeksprint	1700Z-1900Z, Jul 12
+ Phone Weekly Test	0230Z-0300Z, Jul 13
+ A1Club AWT	1200Z-1300Z, Jul 13
+ CWops Test	1300Z-1400Z, Jul 13
+ VHF-UHF FT8 Activity Contest	1700Z-2000Z, Jul 13
+ Mini-Test 40	1700Z-1759Z, Jul 13

Continued on Page 25

Contest Calendar - July 2022, Continued

+ Mini-Test 80	1800Z-1859Z, Jul 13
+ CWops Test	1900Z-2000Z, Jul 13
+ RSGB 80m Club Championship, SSB	1900Z-2030Z, Jul 13
+ CWops Test	0300Z-0400Z, Jul 14
+ CWops Test	0700Z-0800Z, Jul 14
+ RTTYOPS Weeksprint	1700Z-1900Z, Jul 14
+ EACW Meeting	1900Z-2000Z, Jul 14
+ QRP Fox Hunt	0100Z-0230Z, Jul 15
+ NCCC RTTY Sprint	0145Z-0215Z, Jul 15
+ NCCC Sprint	0230Z-0300Z, Jul 15
+ K1USN Slow Speed Test	2000Z-2100Z, Jul 15
+ Russian Radio Team Championship	0700Z-1459Z, Jul 16
+ Trans-Tasman Low-Bands Challenge	0800Z-1400Z, Jul 16
+ IARU Region 1 70 MHz Contest	1400Z, Jul 16 to 1400Z, Jul 17
+ North American QSO Party, RTTY	1800Z, Jul 16 to 0559Z, Jul 17
+ CQ Worldwide VHF Contest	1800Z, Jul 16 to 2100Z, Jul 17
+ RSGB International Low Power Contest	0900Z-1200Z and 1300Z-1600Z, Jul 17
+ CQC Great Colorado Gold Rush	2000Z-2159Z, Jul 17
+ Run for the Bacon QRP Contest	2300Z, Jul 17 to 0100Z, Jul 18
+ K1USN Slow Speed Test	0000Z-0100Z, Jul 18
+ ICWC Medium Speed Test	1300Z-1400Z, Jul 18
+ OK1WC Memorial	1630Z-1729Z, Jul 18
+ ICWC Medium Speed Test	1900Z-2000Z, Jul 18
+ RSGB FT4 Contest	1900Z-2030Z, Jul 18
+ Worldwide Sideband Activity Contest	0100Z-0159Z, Jul 19
+ ICWC Medium Speed Test	0300Z-0400Z, Jul 19
+ RTTYOPS Weeksprint	1700Z-1900Z, Jul 19
+ Phone Weekly Test	0230Z-0300Z, Jul 20

Continued on Page 26

Contest Calendar - July 2022, Continued

+ A1Club AWT	1200Z-1300Z, Jul 20
+ CWops Test	1300Z-1400Z, Jul 20
+ Mini-Test 40	1700Z-1759Z, Jul 20
+ VHF-UHF FT8 Activity Contest	1700Z-2000Z, Jul 20
+ Mini-Test 80	1800Z-1859Z, Jul 20
+ CWops Test	1900Z-2000Z, Jul 20
+ Walk for the Bacon QRP Contest	0000Z-0100Z, Jul 21 and 0200Z-0300Z, Jul 22
+ NAQCC CW Sprint	0030Z-0230Z, Jul 21
+ CWops Test	0300Z-0400Z, Jul 21
+ CWops Test	0700Z-0800Z, Jul 21
+ RTTYOPS Weeksprint	1700Z-1900Z, Jul 21
+ NTC QSO Party	1900Z-2000Z, Jul 21
+ QRP Fox Hunt	0100Z-0230Z, Jul 22
+ NCCC RTTY Sprint	0145Z-0215Z, Jul 22
+ NCCC Sprint	0230Z-0300Z, Jul 22
+ K1USN Slow Speed Test	2000Z-2100Z, Jul 22
+ ARAM 50 MHz Contest	0000Z-2359Z, Jul 23
+ YOTA Contest	1000Z-2159Z, Jul 23
+ K1USN Slow Speed Test	0000Z-0100Z, Jul 25
+ QCX Challenge	1300Z-1400Z, Jul 25
+ ICWC Medium Speed Test	1300Z-1400Z, Jul 25
+ OK1WC Memorial	1630Z-1729Z, Jul 25
+ ICWC Medium Speed Test	1900Z-2000Z, Jul 25
+ QCX Challenge	1900Z-2000Z, Jul 25
+ Worldwide Sideband Activity Contest	0100Z-0159Z, Jul 26
+ ICWC Medium Speed Test	0300Z-0400Z, Jul 26
+ QCX Challenge	0300Z-0400Z, Jul 26

Continued on Page 27

Contest Calendar - July 2022, Continued

+ RTTYOPS Weeksprint	1700Z-1900Z, Jul 26
+ SKCC Sprint	0000Z-0200Z, Jul 27
+ Phone Weekly Test	0230Z-0300Z, Jul 27
+ A1Club AWT	1200Z-1300Z, Jul 27
+ CWops Test	1300Z-1400Z, Jul 27
+ Mini-Test 40	1700Z-1759Z, Jul 27
+ Mini-Test 80	1800Z-1859Z, Jul 27
+ CWops Test	1900Z-2000Z, Jul 27
+ CWops Test	0300Z-0400Z, Jul 28
+ CWops Test	0700Z-0800Z, Jul 28
+ RTTYOPS Weeksprint	1700Z-1900Z, Jul 28
+ RSGB 80m Club Championship, Data	1900Z-2030Z, Jul 28
+ QRP Fox Hunt	0100Z-0230Z, Jul 29
+ NCCC RTTY Sprint	0145Z-0215Z, Jul 29
+ NCCC Sprint	0230Z-0300Z, Jul 29
+ K1USN Slow Speed Test	2000Z-2100Z, Jul 29
+ Feld Hell Sprint	0000Z-2359Z, Jul 30
+ RSGB IOTA Contest	1200Z, Jul 30 to 1200Z, Jul 31
+ Tennessee State Parks on the Air	1400Z-2200Z, Jul 30 and 1400Z-2200Z, Jul 31
+ WAB 144 MHz Low Power Phone	1400Z-1800Z, Jul 30
+ ARS Flight of the Bumblebees	1700Z-2100Z, Jul 31

Our thanks to Bruce Horn, WA7BNM for use of this calendar! Visit Bruce at 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.