



The RELAY)))

DECEMBER 2019



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

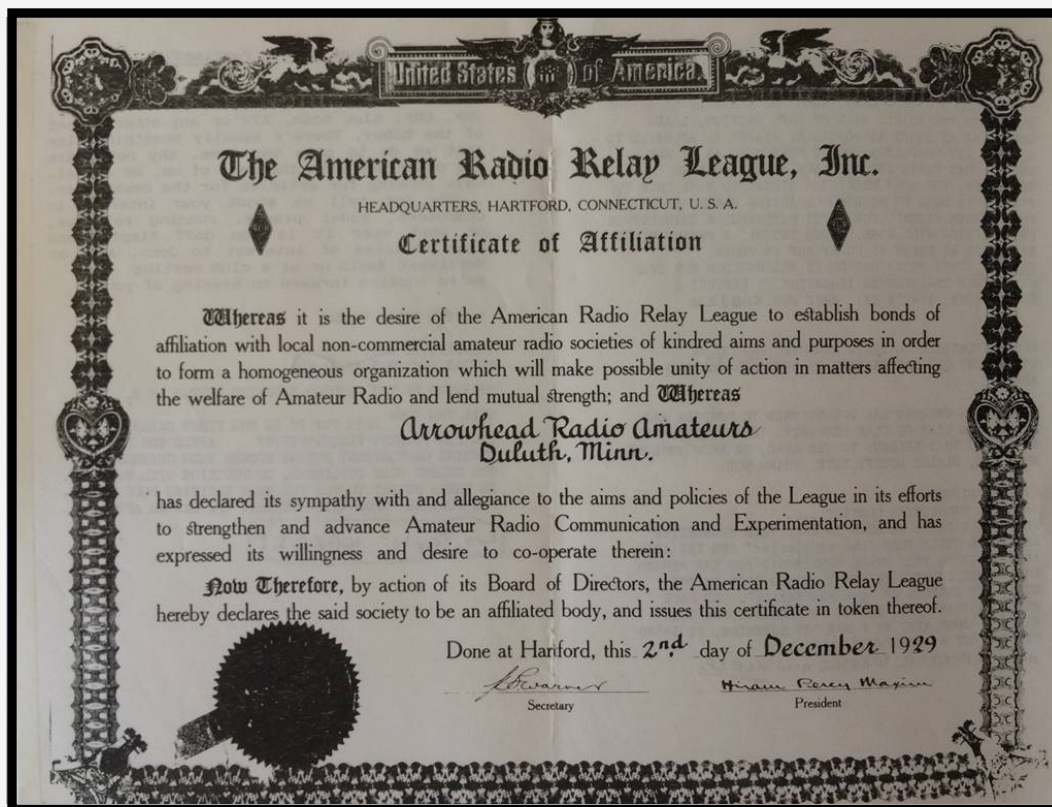
ARAC 90th Anniversary	1
Prez Sez	2
ARAC Board	3
Club Mtg Minutes	4-5
MARS	6
Contest Calendar	7-9
CW Abbreviations	10
Band Plan	10
Nets	11
Upcoming Events	12
Repeaters	13
Members' Email	14
Calendar	15
Committee Chairs	16

ARAC's 90th Anniversary

Almost ninety-three years ago, in February 1927, a Radio Instructor named Mr. Heiser gave the code and theory test ten young men. They sat for their exam around a big oak table on the second floor of the Federal Building in Duluth, eager to earn their official amateur radio licenses. Among them were Arthur Wright W9GKM, John Young W9GKN, Lawrence Lindesmith W9GKO, and Carl Johnson W9GKP.

During that time, many area young people who were drawn to "all things radio" made their way to the home of Palmer Anderson, a former cargo ship dock loader who was bed-ridden from a terrible work accident.

Continued on page 17



"Arrowhead Radio Amateurs" Official Certificate of Affiliation from the ARRL—Dec 2, 1929



Join us on facebook!

Co-Editors:

Kim & Steve Waller

Kim - KEØNQS • Steve - KEØNQT

KEØNQS.mn@gmail.com
KEØNQT@gmail.com



Prez Sez ...

HO HO HO!! MERRY CHRISTMAS !!!

Yes it is December and that means the **A.R.A.C Christmas Party** at the December club meeting on **December 12**. Please note we start at **6:00 PM** that night. We ask everyone to bring a non-perishable food item for the Food Shelf. Also, if you can pick up something for the gift exchange that would be great. There will be food provided by the club but many people also bring a dish to share. We will start at 6:00 PM with business meeting, the election of Club Officers and the presentation of the W9IBM award. After that we will eat and be entertained by singers from Duluth East High School. Hope to see you all there!!!

90 Years Old, That is how old the A.R.A.C. will be in December. We are planning to operate a special event using the WØGKP call sign. Mike Lovold NØPDG is designing a special QSL card for this. The plan is for club members to operate from home using the Club call and you would need to keep a log of all contacts you make. We haven't set the date yet; it would most likely be a one-week period, so pay attention to the 94 net or get ahold of me.

MERRY CHRISTMAS AND HAPPY NEW YEAR !!!

Gene Ellefsen NØVRM

ARAC Board of Directors

PRESIDENT



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

VICE PRESIDENT



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

SECRETARY



NØCALL
Robin Davis

218-391-3Ø77
davisfam2858@yahoo.com

TREASURER



KEØNIT
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

KDØYLN
Robert Boyd
5054 Boulder Dr
Hermantown, MN 55811



**It's time to elect our
ARAC Board Members for 2020!**

Nominations for Club Officers

PRESIDENT
Gene Ellefsen-NØVRM

VICE PRESIDENT
Mike Lovold-NØPDG

SECRETARY
Robin Davis

TREASURER
Bruce Carlson-KEØNIT

FIRST YEAR BOARD MEMBER
Gary Minter-KD9ABS

**Attend the December 12th Club Meeting
at 6:00 p.m. to vote.**

**The evening will continue with a
Celebration of our 90th Anniversary &
Christmas Party**

The Thomas J Reibold Award honors outstanding service to the Club and to the hobby of Ham Radio. The 2019 Award will be presented at the December 12th meeting.

ALSO: Don't forget to bring a gift for the gift table and also a non-perishable food item for the food shelf!



ARAC Club Meeting Minutes

November 14, 2019

Present:

President Gene Ellefsen-N0VRM
Vice President Mike Lovold-N0PDG
Treasurer / Membership Bruce Carlson-KE0NIT
Secretary Robin Davis
Third Year Board Gary Minter-KD9ABS
Second Year Board Dave Davis-AA0AC
First Year Board Bob Boyd-KD0YLN
Chaplain (Visiting) Rolland Bockbrader-KB0CK
Special Events – Open / Gene Ellefsen-N0VRM acting
Ham Fest / Education Bob Schultz-KC0NFB
Property / Picnic Scott Ahlgren-N0VYU
Newsletter / Historian Kim Waller-KE0NQS
Newsletter Steve Waller-KE0NQY
Repeater Randy Wabik-KR0B
Testing Doug Nelson-AA0AW

Absent:

Parliamentarian Grant Forsyth-KC0WUP
Repeater Derek McCorison-W0DNF
Repeater Randy Haglin-N0BZZ
Web Site Thomas Dorr-KE0RHA

Meeting called to order by President Gene-N0VRM at 7:03 pm

Minutes:

Minutes from November Board meeting – Mike-N0PDG took the minutes for the Board meeting and he used his daughter's notebook. They are missing for now because she took the notebook with her. October minutes have been posted on the web page and are in the newsletter

Treasurer's Report:

Checking 1,664.87
Savings 1,372.37
Cash Subtotal \$3,037.24

Outstanding Check (Repeater # 1414) -1,100.00

Winter CD 1,707.19
Summer CD 1,700.00
CD Subtotal \$3,407.19

Grand Total \$5,344.43

Motion to approve by Bob-KC0NFB, seconded by Mark Soder-KI0DB, motion passed

Continued on Page 5



ARAC Club Meeting Minutes, Continued from Page 4

Board Meeting:

Two motions discussed and made at the Board meeting. They are:

Motion to spend up to \$500.00 for the food for the Christmas party, moved by Doug-AA0AW, seconded by Scott-N0VYU, motion passed

Motion to spend up to \$100.00 for gifts, moved by Mike-N0PDG, seconded by Dave-AA0AC, motion passed

Committee Reports:

Christmas Party:

Donations for gifts to drawn from the attendance tickets and given away during the Christmas Party. Please also bring in potluck items as well. The Club buys meat & cheese trays, a fruit tray, a veggie tray, along with Bob-KC0NFB's Beans and Dennis Anderson-W0DIO's famous meatballs (made by Judy Anderson). Everyone is reminded to bring a non-perishable food item or two for the Food Shelf. It is the time of year where folks are hungry and there is a great need for the food shelves to be utilized

Education:

Down to three (3) in the class. New class starting in February 2020. Last day of class will be testing session. General and Extra class is also down to three (3) as well

Testing:

December 10, House of Refuge, 115 W Myrtle St, 5:30 registration, 6:00 testing, \$15.00 fee, copy of your license if up-grading. Questions? Call or email Doug-AA0AW

Chaplain:

A card & gift was sent to the family of Mark Rude-AK0Z

Also a card to Carol Christensen-KC0MAK with the passing of her mother

Special Events:

Sky Warn Recognition Day

December 7, 2019, starting Friday night at 6:00 pm. We will have two (2) HF stations operating. It is open to visitors but weather station security requires prior permission to gain access, talk to Doug-AA0AW for pre-approved access. It is quite interesting and you get a chance to meet the Meteorologists. It is also Pearl Harbor Day. There is an in-house competition with different certificates, nobody wins and it is just for fun. Listen on the Repeater for contacts

ARAC 90th Club Anniversary:

90th Anniversary of ARAC is coming up in December, on December 3, 2019. The Board discussed hosting a weeklong event using W0GKP call sign instead of your personal Amateur Radio Call Sign. This was done for the 70th and the 80th Anniversary celebrations. Mike-N0PDG is working on a special QSL card. Personal touch using the Call Sign but also indicating the operator. Kim-KE0NQS, Mike-N0PDG and Steve-KE0NQT are working on a program discussing the history of the Club, where the Club came from and why it was formed

Nominations for Club Officers:

President:

Gene Ellefsen-N0VRM

0

Vice President:

Mike Lovold-N0PDG

Secretary:

Robin Davis

Treasurer:

Bruce Carlson-KE0NIT

First Year Board Member:

Gary Minter-KD9ABS

Thank you to Dave-AA0AC for handling the nominations

Winner of \$5.00 door prize - Diane Saunders-K0DSL

Motion to adjourn by Mike-N0PDG, seconded by several, motion passed

U.S. AIR FORCE MILITARY AUXILIARY RADIO SYSTEM

Minnesota State MARS Director
Reginald B. Cass / AFS5MN



Gene Ellefsen
NØVRM

Thank you for your time and interest.

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

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

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

Cyber Awareness https://iatraining.disa.mil/eta/disa_cac2018/launchPage.htm

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

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

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

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

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

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

For even more information please open and read the attachment.

Our recruitment team is as follows:

AFA5XK Dave, WB7DRU wb7dru@gmail.com

AFA5ZV Randy, KRØB afa5zv@gmail.com

AFA5JY Reg, KAØRJY reg_cass@msn.com



Contest Calendar - December 2019

+ ARS Spartan Sprint	0200Z-0400Z, Dec 3
+ QRP Fox Hunt	0200Z-0330Z, Dec 4
+ Phone Fray	0230Z-0300Z, Dec 4
	1300Z-1400Z, Dec 4 and
	1900Z-2000Z, Dec 4 and
+ CWops Mini-CWT Test	0300Z-0400Z, Dec 5
+ QRP ARCI Topband Sprint	0000Z-0300Z, Dec 5
	1800Z-1900Z, Dec 5 (CW) and
	1900Z-2000Z, Dec 5 (SSB) and
	2000Z-2100Z, Dec 5 (FM) and
	2100Z-2200Z, Dec 5 (Dig)
+ NRAU 10m Activity Contest	2000Z-2200Z, Dec 5
+ SKCC Sprint Europe	0145Z-0215Z, Dec 6
+ NCCC RTTY Sprint	0200Z-0330Z, Dec 6
+ QRP Fox Hunt	0230Z-0300Z, Dec 6
+ NCCC Sprint	2200Z, Dec 6 to 1600Z, Dec 8
+ ARRL 160-Meter Contest	0500Z-0800Z, Dec 7 and
	1500Z-1800Z, Dec 7 and
	0700Z-1000Z, Dec 8
+ UFT Contest	0600Z-0629Z, Dec 7 and
	0630Z-0659Z, Dec 7 and
	0700Z-0729Z, Dec 7 and
	0730Z-0800Z, Dec 7
+ Wake-Up! QRP Sprint	1200Z, Dec 7 to 2400Z, Dec 8
+ SKCC Weekend Sprintathon	1600Z, Dec 7 to 1559Z, Dec 8
+ PRO CW Contest	1600Z, Dec 7 to 1559Z, Dec 8
+ International Naval Contest	1800Z, Dec 7 to 2359Z, Dec 8
+ FT Roundup	2000Z, Dec 7 to 1959Z, Dec 8
+ EPC Ukraine DX Contest	2000Z-2300Z, Dec 8
+ QRP ARCI Holiday Spirits Homebrew Sprint	0100Z-0300Z, Dec 9
+ 4 States QRP Group Second Sunday Sprint	0130Z-0330Z, Dec 11
+ NAQCC CW Sprint	

Continued on Page 8

Contest Calendar - December 2019, Continued

+ QRP Fox Hunt	0200Z-0330Z, Dec 11
+ Phone Fray	0230Z-0300Z, Dec 11
	1300Z-1400Z, Dec 11 and
	1900Z-2000Z, Dec 11 and
+ CWops Mini-CWT Test	0300Z-0400Z, Dec 12
+ NCCC RTTY Sprint	0145Z-0215Z, Dec 13
+ QRP Fox Hunt	0200Z-0330Z, Dec 13
+ NCCC Sprint	0230Z-0300Z, Dec 13
+ PODXS 070 Club Triple Play Low Band Sprint	0000Z, Dec 14 to 2359Z, Dec 16
+ ARRL 10-Meter Contest	0000Z, Dec 14 to 2400Z, Dec 15
+ TRC Digi Contest	0600Z, Dec 14 to 1800Z, Dec 15
+ CQC Great Colorado Snowshoe Run	2100Z-2259Z, Dec 15
+ Run for the Bacon QRP Contest	0200Z-0400Z, Dec 16
+ NAQCC CW Sprint	0130Z-0330Z, Dec 18
+ QRP Fox Hunt	0200Z-0330Z, Dec 18
+ Phone Fray	0230Z-0300Z, Dec 18
	1300Z-1400Z, Dec 18 and
	1900Z-2000Z, Dec 18 and
+ CWops Mini-CWT Test	0300Z-0400Z, Dec 19
+ NCCC RTTY Sprint	0145Z-0215Z, Dec 20
+ QRP Fox Hunt	0200Z-0330Z, Dec 20
+ NCCC Sprint	0230Z-0300Z, Dec 20
+ AGB-Party Contest	1600Z-1700Z, Dec 20
+ Russian 160-Meter Contest	2000Z-2400Z, Dec 20
+ OK DX RTTY Contest	0000Z-2400Z, Dec 21
+ Feld Hell Sprint	0000Z-2359Z, Dec 21
+ Gedebage CW Contest	1200Z, Dec 21 to 1159Z, Dec 22
+ Padang DX Contest	1200Z, Dec 21 to 1159Z, Dec 22
+ Croatian CW Contest	1400Z, Dec 21 to 1400Z, Dec 22
+ ARRL Rookie Roundup, CW	1800Z-2359Z, Dec 22
+ SKCC Sprint	0000Z-0200Z, Dec 25

Continued on Page 9



Merry Christmas

+ Phone Fray	0230Z-0300Z, Dec 25 1300Z-1400Z, Dec 25 and 1900Z-2000Z, Dec 25 and
+ CWops Mini-CWT Test	0300Z-0400Z, Dec 26
+ DARC Christmas Contest	0830Z-1059Z, Dec 26
+ NCCC RTTY Sprint	0145Z-0215Z, Dec 27
+ NCCC Sprint	0230Z-0300Z, Dec 27
+ RAC Winter Contest	0000Z-2359Z, Dec 28
+ Original QRP Contest	1500Z, Dec 28 to 1500Z, Dec 29
+ Stew Perry Topband Challenge	1500Z, Dec 28 to 1500Z, Dec 29
+ RAEM Contest	0000Z-1159Z, Dec 29 1300Z-1400Z, Dec 30 and 1900Z-2000Z, Dec 30 and
+ QCX Challenge	0300Z-0400Z, Dec 31
+ Bogor Old and New Contest	0900Z-2359Z, Dec 31

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

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



CW Abbreviations

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



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

US Amateur Radio Bands

US AMATEUR POWER LIMITS

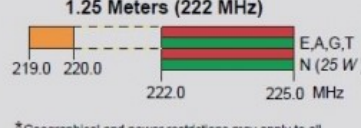
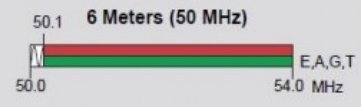
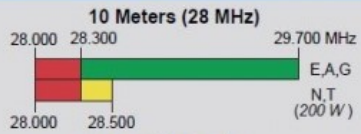
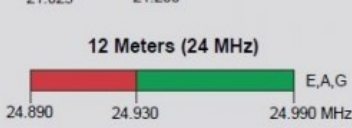
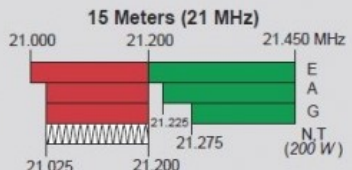
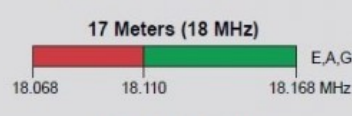
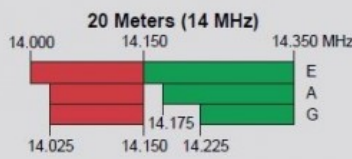
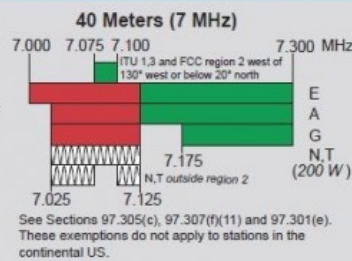
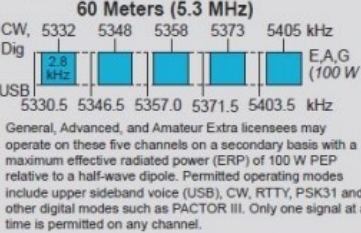
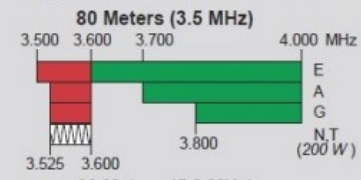
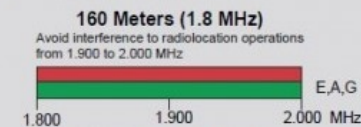
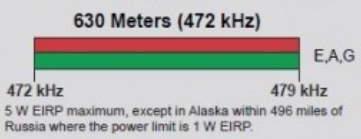
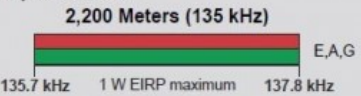
FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

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

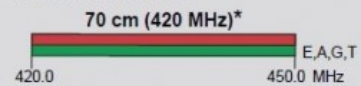


The national association for
ARRL AMATEUR RADIO

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



*Geographical and power restrictions may apply to all bands above 420 MHz. See The ARRL Operating Manual for information about your area.



All licensees except Novices are authorized all modes on the following frequencies:

2300-2310 MHz	10.0-10.5 GHz ‡	122.25-123.0 GHz
2390-2450 MHz	24.0-24.25 GHz	134-141 GHz
3300-3500 MHz	47.0-47.2 GHz	241-250 GHz
5650-5925 MHz	76.0-81.0 GHz	All above 275 GHz

‡ No pulse emissions

KEY

Note: CW operation is permitted throughout all amateur bands.

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

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

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

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

See ARRLWeb at www.arrl.org for detailed band plans.

ARRL We're At Your Service

ARRL Headquarters:
860-594-0200 (Fax 860-594-0259)
email: hq@arrl.org

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Toll-Free 1-800-326-3942 (860-594-0355)
email: nowham@arrl.org

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

Nets... Nets... Nets... Nets... Nets... Nets... Nets... Nets...

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

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



**Next
ARAC Board Meeting**
Tuesday, Dec 3, 2019
@ 6:30 p.m.
Sammy's West Duluth

KCØNFB Bob, would like to remind all hams to **make sure your license is current** and up-to-date on your address. You can visit the FCC ULS to check it and make changes at www.fcc.gov/uls.

Amateur Radio License Testing

- Dec 10
House of Refuge
115 West Myrtle, Duluth, MN

5:30 pm registration, 6:00 testing, \$15.00 testing fee, which is a bargain
Questions? Contact Bob KCØNFB at kc0nfb@charter.net

General & Expert License Study Group

- With Diane Saunders KØDSL
- Tuesdays through Dec 3rd
 - 7pm—9 pm
House of Refuge

CLUB REPEATER
WØGKP

146.94 (-)
CTCSS TONE
103.5

Next ARAC Club Meeting:
ARAC's
90th Anniversary
Christmas Party!

Thursday, December 12, 2019
6 p.m.

Copper Top Church

Please bring a non-perishable food item
for food shelves that
serve needy families this
Holiday Season!

Bring your piece of ARAC History
to display on our
Club History Table

- Club Business: Election of Officers
- Door Prize Drawing
- Tasty Food (Bring a treat to share if you'd like!)
- Gift Exchange: Bring a gift of \$10 value to share
- Club History Presentation

Interested in providing a program, or have an idea for one? Contact Mike NØPDG at lovoldm@gmail.com

Duluth Area Repeaters



ARAC System WØGKP

Freq.	Offset	Tone	Location
146.940	minus	103.5	Duluth
146.940	minus	107.2	Lakeside (rcv)
146.940	minus	151.4	Two Harbors (rcv)
146.940	minus	100.0	Gary-New Duluth (rcv)
146.940	minus	123.0	Solway (rcv)
146.940	minus	110.9	Cloquet (rcv)
147.000	minus	103.5	Mahtowa
444.100	plus	103.5	Duluth UHF Link

N9MMU/N9QWH System (WI)

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

WECOMM – WI Statewide Linked System WE9COM

147.075 plus 110.9 Meteor Hill (closest repeater to Duluth)

LSAC System #1

147.330	plus	151.4	Proctor
147.330	plus	103.5	Duluth (rcv for Proctor)
147.330	plus	156.7	Duluth (North) (Fish Lake)
147.270	plus	114.8	Two Harbors
147.270	plus	103.5	Wales
147.090	plus	114.8	Silver Bay
145.410	minus	114.8	Finland
147.300	plus	114.8	Isabella
145.150	minus	103.5	Washburn, WI
146.700	minus	103.5	Bayfield, WI
443.850	+5.00	none	Bayfield, WI
147.165	plus	110.9	Hurley, WI
146.640	minus	151.4	Ely
443.500	+5.00	141.3	Gilbert
147.060	plus	103.5	Virginia
147.360	plus	162.2	Cook
147.165	plus	114.8	Coleraine
443.925	+5.00	110.9	Brainerd

NARC System NAØRC

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

Stand Alone Repeaters

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

Fusion and D Star

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

147.15Ø	plus	151.4	NTØB Gilbert Fusion Rptr
145.17Ø	minus	11Ø.9	WA9KLM Superior – Douglas County RACES/ARES Fusion Repeater

443.1ØØ +5.ØØ 1Ø3.5 KBØYHX Cloquet – Carlton County RACES/ARES Fusion Repeater

444.3ØØ +5.ØØ 1Ø3.5 NØEO Spirit Valley Amateurs Fusion Repeater WIRES-X NØEO

147.375 plus NØEO D Star
442.2ØØ plus NØEO D Star

[Repeater list compiled by Dr. Frequency—KCØWDQ]

ST. Louis County Department of Emergency Services Net Control Roster

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

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

Ten Meter SSB Net Control Roster

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

Sunday Nights at 2ØØØ on 28.45Ø MHz USB

Ten Meter CW Net Control Roster

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

Sunday Nights at 193Ø on 28.125 MHz

Northland Weather Group Net Control Roster

KCØMKS Jeff Nast

Monday Nights at 2ØØØ on the ARAC System

Douglas County Net

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

Central Carlton County Net

Tuesday Nights at 2Ø3Ø on the ARAC System

Lake County RACES/ARES Net

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

Elmers

El-mer / el-mær/ [el-mer]

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

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

Membership E-mail Directory

Ahlgren, Scott NØVYU
sahlgren01@msn.com
Anderson, Jim NØJWA
kcØmko@centurylink.net
Anway, Allen KC9LJN
allen@a2d2.com
Anway, Dorothy KC9LSG
dorothy@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
Ispitech@mail.com
Ferch, Tim AKØTF
akØtf@aol.com
Fisher, Bud NØGGF
nØggf@arrl.net
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
Fuller, Donn ADØN
donnfuller@midco.net
Freeman, Roger NØGRX
rf2134@aol.com
Gibbs, Rex NØKXT
nØkxt@yahoo.com
Godbout, Med WØEEZ
wØeezmedgodbout@centurytel.net
Hanson, Gary NUØW
captaingary@chartermi.net
Harstad, Ben KEØJDB
coast_guard_aux_duluth@yahoo.com

Hawkinson, Garry WØELH
garryhawkinson@yahoo.com
Jakubek, Patrick KDØSGK
kdØsgk@gmail.com
Johnson, Randy AAØME
randy@nsw4x4.com
Leslie, Shirl KBØSBM
dsleslie@centurytel.net
Makowski, Cletus KBØLBS
kbØlbs52@msn.com
Makowski, Karen NØWEZ
k-wez1@hotmail.com
Marchetti, Jim KEØLHX
jimmarchetti@live.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)
AJ KDØYQA
Ben KDØYPZ
Joe KDØYQB
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 Sr. KCØSJB
rdrunner5Ø7@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 KEØHHQ
David.pyrlik@gmail.com
Reger, Bernard KB9KQZ
Mike KB9KRA
Brian KB9KUX
Chris KB9WJQ
bjr5488@yahoo.com

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

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

Rosell, Dawson KEØHEL
rosel032@d.umn.edu
Rude, Mark AKØZ
rudemark@q.com
Saunders, Diane KØDSL
kØdslae@gmail.com
Scholz, Greg KDØUYN
kdØuyn@gmail.com
Schreyer, Dave WAØAWZ
kaØfyb@mediacombb.net
Schulz, Robert KCØNFB
kcØnfb@charter.net
Snyder, Mark ACØLE
snyds1118@msn.com
Stark, John KCØYVH
johnvinyl@yahoo.com
Stroud, Butch KCØPDK
kenwren@netzero.net
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

Co-Editors,
Kim & Steve Waller



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 LSAC & ARAC

DECEMBER

CLUB EVENTS

TUESDAY NIGHT NETS
 2000 - Douglas Cty 145.490 MHz
 2030 - Central Carlton County
WEDNESDAY NIGHT NETS
 1900 - Lake County - LSAC1
 2nd & 4th Wednesdays
 2100 - BWAR

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 CW 1930 AA0AW USB 2000 K9KDK ES 2100 K0DSL	2	3 ARAC BOARD MEETING 1900 Sammy's West Duluth DC Net 2000 CC Net 2030	4 2100 - BWAR	5	6	7 SRD
8 CW 1930 N0PDG USB 2000 W0DIO ES 2100 AA0ME	9 DC ARES/RACES Mtg 1900 DC EOC WX 2000 KC0MKS	10 DC Net 2000 CC Net 2030	11 Lake County ARES/RACES Meeting 1800 Lake County Net 1900 2100 - BWAR	12  ARAC Club Meeting & 90th Anniversary Christmas Party Coppertop Church 6 pm!	13	14
15 CW 1930 AA0AW USB 2000 N0VRM ES 2100 N9DMG	16 WX 2000 KC0MKS	17 DC Net 2000 CC Net 2030	18 St. Louis County ARES/RACES Mtg 1630 Pike Lake EOC 2100 - BWAR	19	20	21
22 CW 1930 N0PDG USB 2000 N0PDG ES 2100 AA0AW	23 WX 2000 KC0MKS	24 DC Net 2000 CC Net 2030	25 Lake County Net 1900 2100 - BWAR	26 Carlton County ARES/RACES Meeting 1900 CC EOC	27	28 Club Breakfast @ The Chalet 0730-0800
29 CW 1930 AA0AW USB 2000 AA0AW ES 2100 KC0WDQ	30 WX 2000 KC0MKS	31 DC Net 2000 CC Net 2030				

Get this newsletter *faster*
via email!
Email Doug AAØAW at
aa0aw@arrl.net

Next Meeting: Thursday,
December 12, 2019 - 6 pm
Coppertop Church

ARAC Committee Chairs

Club License Trustee:
Ray Barnes KEØZN

Control Operators:
AAØAW - NØKXT - KCØNFB

Newsletter:
Kim KEØNQS & Steve KEØNQT Waller

Education Chair:
Bob Schulz KCØNFB

Hamfest Chair:
Bob Schulz KCØNFB

Chaplains:

Visiting Chaplains:
Denny Anderson WØDIO

Parliamentarian:
Grant Forsyth KCØWUP

Website:
Thomas Dorr KEØRHA

Membership:
Bruce Carlson KEØNIT

Property Chair:
Wulf Gar WU1FGR

Testing:
Doug Nelson AAØAW

Field Day:
Dennis Anderson WØDIO

Picnic Chair:
Scott Ahlgren, NØVYU

Repeater Chairs:
Randy Haglin NØBZZ
Randy Wabik KAØJZV

CONGRATULATIONS

To new hams who have joined our community in the last few weeks, as well as those who have newly upgraded — to General or Extra:

Dave Schreyer WAØAWZ - New Club Member!

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

ARAC 90th Anniversary, Continued from Page 1

With his right hand, Palmer Anderson W9DOQ worked a telegraph key on a clip board laid out on his stomach while he reclined. He tapped out international morse code and ran a ham radio parts exchange out of his home. A steady stream of admiring visitors helped him pack and unpack radio parts orders as they learned about the exciting world of amateur radio by listening to him speak.

After awhile, Lawrence Lindesmith started talking to his newly-licensed fellow hams about forming an official club and an application to the American Radio Relay League was sent as they waited with great anticipation. Then one day, from ARRL's headquarters in Hartford, Connecticut, came a Certificate of Affiliation that was granted on December 2, 1929 to "Arrowhead Radio Amateurs, Duluth, Minnesota", signed by ARRL president and founder Hiram Percy Maxim.

At least 5 charter Club members (Lindesmith, Wright, Johnson, Young & Anderson) began meeting in each others homes, helping each other assemble their stations and discussing 20 meters and cw as well as the latest technology in voice communication via radio waves according to *Radio News* magazine and *Popular Mechanics*.

Amateur radio originally was limited to morse code, but early amateur radio operators were often also involved in the proliferation of broadcast radio stations. In his excellent article "Vintage Radio: The Contributions Of 'Amateurs'- Giving Radio A Voice", Paul Litwinovich's of WHSU 1260 AM, Westport Connecticut writes:

"[Early] Amateur operators were fascinated by the prospect of sending voice over radio waves. They started by building small homemade radio frequency alternators and inserting a carbon telephone

Continued on page 18



Radio Pioneer Hiram Percy Maxim,
circa 1929

Hiram Percy Maxim was an American radio pioneer and inventor, and co-founder of the **American Radio Relay League**. Hiram Percy Maxim is credited with inventing and selling the first commercially successful firearm silencer, and also with developing mufflers for internal combustion engines. -Wikipedia

ARRL History Factoid

The distances that early radio technology could cover, particularly with lower power levels available to most amateurs, were relatively short, about 30 miles on average. The original purpose of the ARRL, as its name implies, was to form a network of amateurs who could relay messages across the country by repeating it from one to another. The league quickly grew in number, and within a year published its first monthly journal, QST, which is a Morse code term meaning that a bulletin is about to be sent for all amateurs. The ARRL also grew in lobbying power and influenced the development of radio regulations that included, and favored, amateur radio operators.

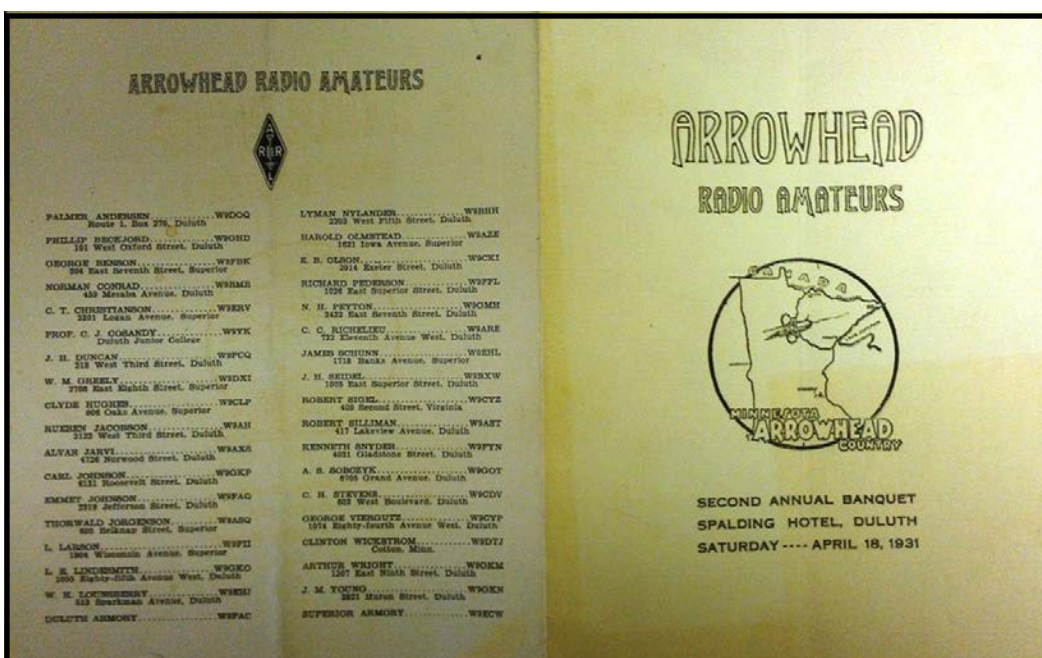
ARAC 90th Anniversary, Continued from Page 17

microphone between the alternator and their antenna. This worked fairly well, but only for transmitters of a scant few watts. More than that would overheat and burn out the microphone.

“Enter the vacuum tube. By the 1920s, the vacuum tube had evolved to the point where it could be used to build transmitters of 100 watts or more, producing a clean signal that could easily be modulated by voice. Tubes also allowed the building of receivers that were sensitive enough to receive and demodulate a voice signal. The general population was fascinated by this new technology, and many built receiver apparatus. Some amateurs began broadcasting music over their stations, as this was not illegal at the time. One such operator, Frank Conrad, whose call sign was 8XK, began doing so in 1916. Radio listeners asked him for more. His efforts led to the first commercial station, Westinghouse's KDKA, going on the air in 1920, where he served as an engineer. The creation of broadcast regulations prohibited amateurs from playing music or other forms of broadcasting. From this point on, they were limited to experimentation and communicating with other amateurs.”

The overlapping interest of broadcast radio and amateur radio has distinct roots in Duluth as well. In June 1926 Charlie Persons arrived in Duluth, Minnesota with the sole aim of working for WEBC. A faithful listener some 30 miles away in Wisconsin, he made a beeline to the broadcast studio located on the second floor of the Spalding Hotel in Duluth. There he met station owner Leslie Ross, who operated the station as a hobby out of the proceeds from his business, Ross Electric Shop. Charlie became a jack-of-all-trades at the radio station, including administering the “open mic” time, in which people interested in broadcast radio could line up down the hallway and wait for their turn to recite their poem, or topical essay or sing a song.

Early hams (including charter ARAC members Lawrence Lindesmith, Art Wright, Carl Johnson and John Young) were among these people on line (giving us an interesting glimpse on an original use of the phrase “on line”!). The Spalding Hotel was a very popular place to gather for those interested in radio of all sorts, so much so that the early Arrowhead Radio Amateurs found it fitting to proudly hold the early annual Club banquets there. Though we have no record of the first annual ARAC banquet, only the second, chances are excellent that the first annual affair was celebrated there as well.



Gathering at Palmer Anderson's house and the Spalding Hotel, our 5 charter club members got to know a lot of others who were interested in radio. Some were licensed hams and others learned more about ham radio from “ARA” Club members while waiting on line at WEBC. The young club was very effective in inviting new members to join the group.

By April 1931, at the time of the Arrowhead Radio

“Arrowhead Radio Amateurs” Second Annual Banquet Program (Front & Back) April 18,

Continued on page 19

ARAC 90th Anniversary, Continued from Page 18

Amateurs second annual banquet, there were 34 official members in the club! Eventually, Charlie Persons of WEBC became an amateur radio operator as well and stayed on to become a regional director at WEBC for 38 years.

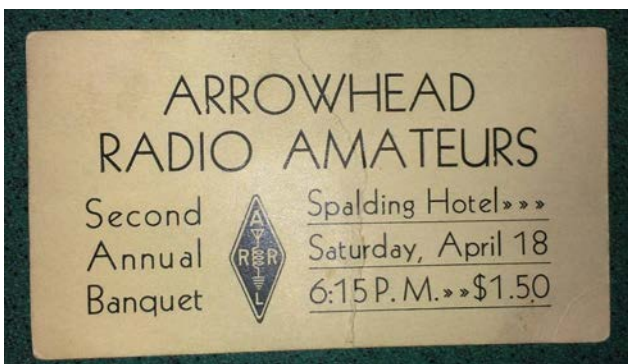
Our "Arrowhead Radio Amateur" charter club members went on to work an entire career at Northwestern Bell Telephone Company (Art Wright W9GKM) and form a new business called Northwest Radio (Lawrence Lindesmith W9GKO, Carl Johnson W9GKP, Palmer Anderson W9DOQ). Other early club members joined our armed forces and went on to make radio history in a variety of ways.

1931 ARROWHEAD RADIO

AMATEUR CLUB MEMBERS

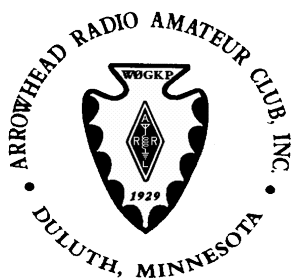
PALMER ANDERSEN -----	W9DOQ	LYMAN E. NYLANDER --	W9BHH
PHILLIP BECKJORD -----	W9GHD	HAROLD OLMSTEAD ---	W9AZE
GEORGE BENSON -----	W9FBK	ELMER B. OLSON -----	W9CKI
NORMAN L. CONRAD -----	W9BMB	RICHARD PEDERSON --	W9FFL
CARL T. CHRISTIANSON ----	W9ERV	N.H. PEYTON -----	W9GMH
PROF. C.J.COSANDY -----	W9YK	CLYDE C. RICHELIEU ----	W9ARE
J.H. DUNCAN -----	W9FCQ	JAMES SCHUNN -----	W9EHL
WILLIAM M. GREELY -----	W9DXI	J.H. SEIDEL -----	W9BXW
CLYDE HUGHS -----	W9CLP	ROBERT SIGEL -----	W9CYZ
RUEBEN JACOBSON -----	W9AH	ROBERT M. SILLIMAN -	W9AST
CARL V. "ALVAR" JARVI ----	W9AXS	KENNETH SNYDER -----	W9PYN
CARL JOHNSON -----	W9GKP	A.S. SOB CZYK -----	W9GOT
EMMET JOHNSON -----	W9FAQ	CLAUDE H. STEVENS ---	W9CDV
THORWALD JORGENSEN -----	W9ASQ	GEORGE VIERGUTZ ----	W9CYP
L. LARSON -----	W9FI	CLINTON WICKSTROM	W9DTJ
LAWRENCE E. LINDESMITH	W9GKO	ARTHUR WRIGHT -----	W9GKM
WILLIAM H. LOUNSBERRY -	W9EHI	JOHNM. YOUNG -----	W9GKN

Look at our 1931 club roster (left) and see how many of these men you knew. Please take some time to share what you know about them so that we can document valuable history of the men that paved the way for the Club we have today. ★



The Spalding Hotel, at the corner of 5th Avenue West & Superior Street

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.

