



The RELAY)))

October
2025



The Official Publication of the Arrowhead Radio Amateur Club
A.R.A.C. Inc. P.O. Box 7164 Duluth MN 55807-7164 <http://www.thearac.org> Dues: Member \$20/Family \$25

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The Relay Co-Editors:
Kim & Steve Waller

Kim - KEØNQS Steve - KEØNQT
KEØNQS.mn@gmail.com KEØNQT@gmail.com



Autumn
2025



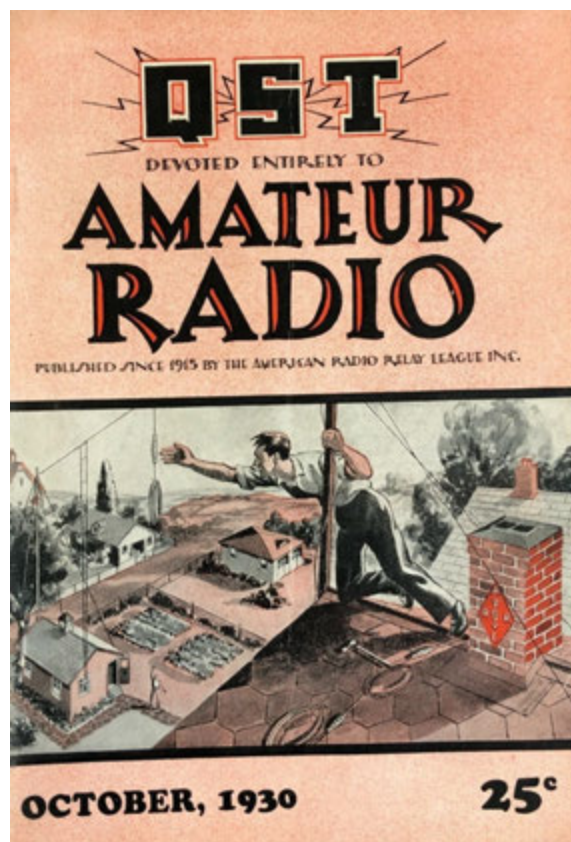
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Amateur Radio History A Look Back at Bands & Licenses

In the twilight of the 19th century, as gas lamps flickered in small-town America and streetcars clattered through bustling cities, a new breed of tinkers and dreamers discovered a realm of invisible waves that promised connection beyond the horizon. These were the earliest ham radio operators, ordinary folks with extraordinary curiosity, scattered across the lakes and prairies of Minnesota, the hills of New England, and the growing sprawl of Chicago. They were farmers, schoolteachers, machinists, and students, united by a shared fascination with the emerging art of wireless telegraphy. In attics, barns, and cluttered workshops, they hunched over homemade contraptions, their fingers stained with solder, their eyes alight with the thrill of coaxing voices and signals from the heavens.

Before the government imposed licenses or carved the spectrum into regulated bands, these pioneers operated in a freewheeling era of experimentation, roughly from the 1890s to 1912. They built their own spark-gap transmitters—crude assemblies of coils, capacitors, and batteries—emitting broad, crackling signals that danced across the airwaves. Antennas, often just wires strung between trees or rooftops, stretched toward the sky, capturing whispers from distant stations. Frequencies weren't neatly defined; operators roamed the shortwave spectrum, typically below 200 meters (above 1.5 MHz), where their spark signals buzzed and sputtered, seeking out others in a vast, unregulated frontier. These early hams, unbound by formal rules, were driven by a hunger to connect, to swap stories with strangers in far-off towns, and to unravel the mysteries of this new technology.

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ARRL's October cover of QST Magazine in 1930 depicts a ham radio enthusiast nimbly navigating his roof to work on an antenna installation.



ARAC Board of Directors

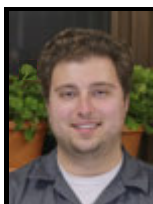
PRESIDENT



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

**No September Board Minutes taken
as there was no Board Quorum.**

VICE PRESIDENT



KØDJP
David Pyrlík

david.pyrlík@gmail.com

SECRETARY



KFØILA
William Turk

williamturk11@gmail.com

September Treasurer's Report:

Checking: 949.27

Savings: 6298.86

Repeater: 4676.33

Assets Subtotal: \$11,924.46

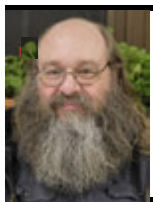
TREASURER



KRØB
Randy Wabik

Submitted by Randy Wabik—KROB

3RD YEAR BOARD

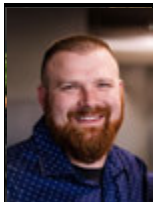


AAØAC
Dave Davis

218-348-6649
aaøac@outlook.com

**Treasurer's Report to be submitted
for discussion and approval
at the
September 11, 2025 Club Meeting.**

2ND YEAR BOARD



KD9VKI
Justin Cheever

jcheever13@gmail.com

1ST YEAR BOARD



KFØLFZ
Brian Beckman





ARAC Club Meeting Minutes

September 11, 2025

Present:

President: Gene Ellefsen – N0VRM
Treasurer/Membership: Randy Wabik - KR0B
Secretary: William Turk – KF0ILA
First Year Board: Brian Beckman- KF0LFZ
Second Year Board: Justin Cheever – KD9VKI
Third Year Board: Dave Davis – AA0AC
Parliamentarian: Grant Forsyth – KC0WUP
HamFest/Education: Bob Schulz – KC0NFB
Special Events: Open/Gene Ellefsen – N0VRM (acting)
Testing: Doug Nelson – AA0AW
Vice President: Dave Pyrlik – K0DJP
Repeater: Dave Pyrlik – K0DJP
Property/Picnic: Scott Ahlgren – N0VYU

Absent:

Newsletter/Historian: Kim Waller – KE0NQS
Newsletter/Historian: Steve Waller – KE0NQT
Web Site: Thomas Dorr – KE0RHA
Chaplin:

Meeting called to order at 19:00 (7:00 PM) by President Gene Ellefsen – N0VRM.

Minutes:

Minutes are posted on the website and in the newsletter. Motion to accept by John Nelson - N0UOZ, seconded by Melinda - KF0GJW, motion Passed.

Treasurer's Report:

Checking: 949.27
Savings: 6298.86
Repeater: 4676.33
Assets Subtotal: \$11,924.46

Firsted by Justin Cheever - KD9VKI seconded by John Nelson - N0UOZ

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ARAC Club Meeting Minutes continued

Testing:

Technician level class will be starting on September 23rd with Bob - KC0NFB, contact him for more details.

Doug - AA0AW will be doing a Extra class study group starting October 1st 6:30-8:30, if anyone is interested please get ahold of Doug so he can get the appropriate study materials together.

As always if you are looking to test or upgrade or know of anyone that is interested in testing, please contact Doug Nelson at AA0AW@arrl.net.

New Business:

Roast Beef Dinner October 2nd at the Copper Top Church \$15 for the meal
Matowa is in need of volunteers to help clean up the area again, Ask Gene for more information.
Nominations for positions are coming up please keep those in mind going forward.
Authorized up to \$200 for a new cavity 94 Repeater, 1sted Justin Cheever - KD9VKI, Seconded by John Nelson -N0UOZ, Motion Passed
Saturday the 27th is fall fest in Carlton \$3 to get in \$4 for a table
First Saturday of October ARES RACES exercise will be conducted
Saturday after the exercise is a star gazing party 7-9:30pm
Planning a float for next year for the parade

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

Butch Clemens - KB0SMG

Door Prize was won by KN0NUL

Motion to adjourn by Bob - KC0NFB, seconded by John Nelson - N0UOZ, motion passed at 19:23 (7:23 PM).



CLUB REPEATER
WØGKP
146.94 (-)
CTCSS TONE



Prez Sez

Hello Everyone,

It is that time of the year. We are now accepting nominations for Club Officers.

Positions open are:

President, Vice President, Secretary, Treasurer, and First Year Board Member.

Nominations will be accepted at the October and November Club meetings and elections will be held at the December meeting. If you are interested in any of these positions, please let a Board Member know.

**73,
Gene Ellefsen NØVRM**



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

Schedule your own Testing Session TODAY!

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

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

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

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

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

UPGRADE CANDIDATES:

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

CW Abbreviations

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

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



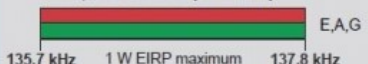
US Amateur Radio Bands

US AMATEUR POWER LIMITS

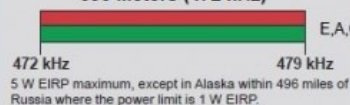
FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

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

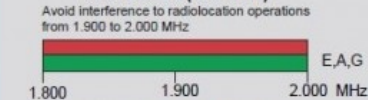
2,200 Meters (135 kHz)



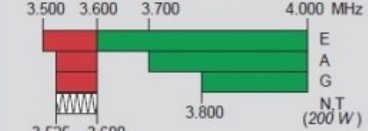
630 Meters (472 kHz)



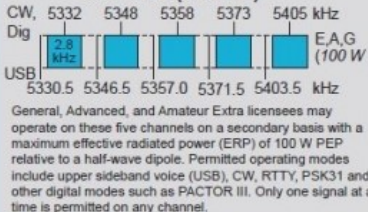
160 Meters (1.8 MHz)



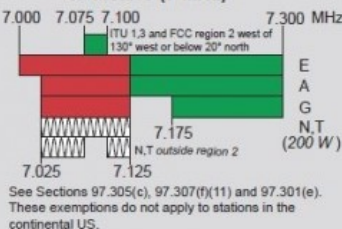
80 Meters (3.5 MHz)



60 Meters (5.3 MHz)



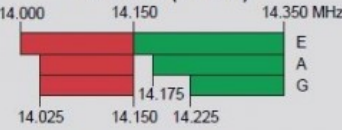
40 Meters (7 MHz)



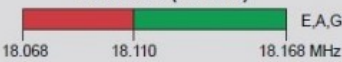
30 Meters (10.1 MHz)



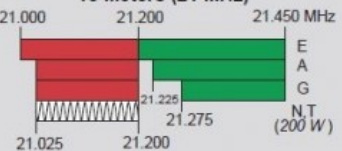
20 Meters (14 MHz)



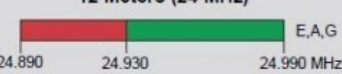
17 Meters (18 MHz)



15 Meters (21 MHz)



12 Meters (24 MHz)



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



ARRL The national association for
AMATEUR RADIO®

KEY

Note:
CW operation is permitted throughout all amateur bands.

MCW is authorized above 50.1 MHz, except for 144.0-144.1 and 219-220 MHz.
Test transmissions are authorized above 51 MHz, except for 219-220 MHz

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

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

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

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email: newham@arrl.org

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

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NETS

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

- **Northland Weather Group Net:** Mondays 2000 on the ARAC repeater (146.940 MHz with a tone of 103.5 and standard offset).
- **Minnesota D-Star Net:** Sundays at 19:30 on Reflector 53A
- **Minnesota Section Net** 1200 and 1730 on 3.860 [Net Manager: NØYR] http://www.mn-section.org/dept_stm.html
- 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
- 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



DULUTH AREA REPEATERS

ARAC System WØGKP

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

N9MMU/N9QWH System (WI)

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

WECOMM – WI Statewide Linked System WE9COM

147.075	plus	110.9	Meteor Hill (closest repeater to Duluth)
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LSAC System – some may work/some may still be linked

147.330	plus	151.4	Proctor
147.270	plus	114.8	Two Harbors
147.270	plus	103.5	Wales
147.090	plus	114.8	Silver Bay
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
443.325	+5.00	146.2	Isanti

Rev. KCØWDQ as of 12/01/24 For ARAC Newsletter

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DULUTH AREA REPEATERS, continued

NARC System NAØRC

147.135	plus	103.5	Knife River
147.135	plus	114.8	Duluth (rcv)

Stand Alone Repeaters

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

Fusion

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

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

145.250	minus	103.5	KBØYHX Cloquet, MN – Carlton County RACES/ARES Fusion Repeater
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444.300	+5.00	103.5	NØEO Duluth, MN – Spirit Valley Amateurs Fusion Repeater WIRES-X NØEO (Analog only) Fusion Room 40494
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444.400	+5.00	103.5	NAØRC Knife River, MN – Wires X Connected to NØEO Room 40494
444.500	+5.00	103.5	NØLCR Two Harbors, MN – Wires X Connected to NØEO Room 40494
444.600	+5.00	103.5	NØLCR Silver Bay, MN – Wires X Connected to NØEO Room 40494
444.800	+5.00	103.5	NØLCR Grand Marais, MN – Wires X Connected to NØEO Room 40494
440.400	+5.00	110.9	WØLSA Maple, WI – Wires X Connected to NØEO Room 40494

D-Star

147.375	plus	NØEO D Star
442.200	plus	NØEO D Star

Rev. KCØWDQ as of 12/01/24 For ARAC Newsletter

Elmers

El-mer / el-mər/ [el-mer]

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

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



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Co-Editors,
Kim & Steve Waller
KE0NQS & KE0NQT



SUNDAY NIGHT NETS
 1930 - CW - 28.125 MHz USB-CW
 2000 -USB 28.450 MHz
 2100 - Southern St. Louis County
 Emergency Services Net
MONDAY NIGHT NETS
 2000- Northland WX Net - ARAC Repeater

OCTOBER

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

	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5 CW 1930 NØPDG USB 2000 AAØAW ES 2100 KØDSL	6 WX 2000 KCØMKS	7 ARAC BOARD MEETING Sammy's Pizza 6:30 pm DC Net 2000 CC Net 2030	8 Lake County ARES/RACES Meeting 1800 Lake County Net 1900 2100 -BWAR	9 ARAC Club Meeting Coppertop Church 7 PM	10	11
12 CW 1930 AAØAW USB 2000 KB9WLB ES 2100 KD9VKI	13 Douglas County ARES/RACES Mtg 1900 DC EOC WX 2000 KCØMKS	14 DC Net 2000 CC Net 2030	15 St Louis County ARES/RACES Meeting 1800 2100 -BWAR	16	17	18
19 CW 1930 NØPDG USB 2000 K9KDK ES 2100 KCØWDQ	20 WX 2000 KCØMKS	21 DC Net 2000 CC Net 2030	22 Lake County Net 1900 2100 -BWAR	23 Carlton County ARES/RACES Meeting 1900 CC EOC	24	25
26 CW 1930 AAØAW USB 2000 KRØB ES 2100 WØNWO	27 WX 2000 KCØMKS	28 DC Net 2000 CC Net 2030	29	30	31	
						

Get this newsletter *faster*
via email!

Email Doug AAØAW at
aa0aw@arrl.net

Next Club Meeting:
October 9, 2025 - 7 pm
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

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Parliamentarian:

Grant Forsyth KCØWUP

Website:

Thomas Dorr KEØRHA

Membership:

Sam Frey KEØYTM

Property Chair:

Scott Ahlgren NØVYU

Testing:

Doug Nelson AAØAW

Field Day:

Picnic Chair:

Scott Ahlgren, NØVYU

Repeater Chairs:

Randy Haglin NØBZZ
Randy Wabik KAØJZV

Contest Calendar at www.contestcalendar.com

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

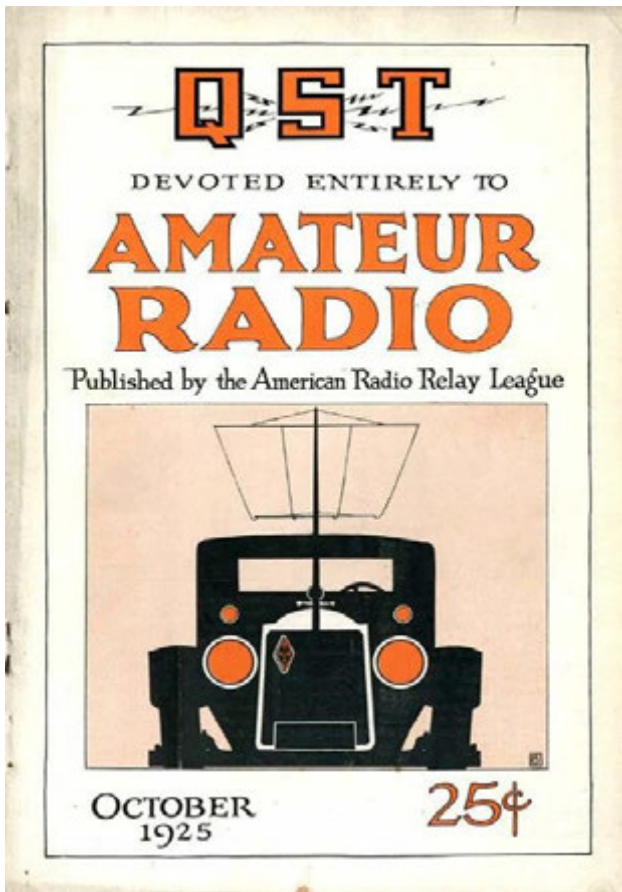
QRZ web site at www.qrz.com

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.

Bands continued from page 1

Picture a young **Hiram Percy Maxim** in 1901, then a budding engineer in Hartford, Connecticut, tinkering late into the night. His makeshift station, a tangle of wires and glowing tubes, hummed with potential. Maxim, who would later found the **American Radio Relay League (ARRL)** in 1914, was among those early enthusiasts who sent Morse code pulses into the dark, hoping for a reply from another soul equally enchanted by the magic of wireless. In small towns like Walla Walla, Washington, or bustling ports like Boston, others joined this adventurous endeavor. A farmer in Nebraska might pause after a day in the fields, climb to his attic, and tap out CQ calls, his signal skipping across the plains to reach a clerk in Philadelphia.



ARRL's October 1925 cover of QST Magazine with a mobile antenna theme, the epitome of art deco ad illustration. In our opinion, the artist depicts a **1925 Chevrolet**, as that model's rectangular grill was distinct from its competitors.



1925 Chevrolet K Series

These were not just hobbyists but explorers, charting a new world where distance dissolved in the crackle of static. Their equipment was as varied as their lives. A typical setup might include a hand-wound coil, a spark gap fashioned from scrap metal, and a crystal detector for receiving—each piece a testament to ingenuity. In cities, some hams scavenged parts from early telephone exchanges, while rural operators repurposed farm tools into antenna supports.

The airwaves they roamed were chaotic, filled with overlapping signals from ships, commercial stations, and fellow amateurs. Yet, this chaos was their playground. They tuned their receivers, often just a galena crystal and a “cat’s whisker” wire, to hunt for signals on frequencies we now call the medium-wave and shortwave bands—roughly 500 kHz to 3 MHz—where their spark transmitters could reach hundreds or even thousands of miles under the right conditions.

These early hams were bound by a shared ethos of learning and camaraderie. They pored over magazines like *Electrical World*, swapping tips on coil design or antenna height. In 1909, the Wireless Association of America, a precursor to the ARRL, began uniting these scattered voices, fostering a community eager to share discoveries. A teenager in rural Ohio might spend weeks perfecting his transmitter, only to hear a faint reply from a station in Maine, sparking a friendship that spanned states. This was the dawn of ham radio: a pursuit of connection, driven by the thrill of hearing a distant call sign through the hiss of the ether.

As the 20th century progressed, these pioneers faced new challenges. **The Radio Act of 1912** introduced licensing and band restrictions, taming the wild airwaves. The Radio Act was passed as a direct result of a young ham radio operator named **Artie Moore**, whose hand-made radio set received a distress signal from **Titanic** as she sank. This astounding news propelled ham radio from the fringe of experimentation to the forefront of world attention, establishing it as an important bona fide technology. Visit www.thearac.org to read Artie Moore’s story in the **February 2023** issue of *The Relay*.

The Radio Act most certainly changed ham radio forever. Pioneer hams found themselves viewed with a new level of respect and legitimacy, but no longer had freeform access to operate as they wished. Their adventurous spirit endured, however, shaping the bands we know today—160 meters (1.8–2 MHz), 80 meters (3.5–4 MHz), and others—where hams continued to innovate.

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Bands continued from page 13

During World War I, the U.S. government shut down amateur radio operations to secure military communications. On April 6, 1917, as the U.S. entered the war, President Wilson issued an executive order suspending all non-military radio activities. Amateurs were required to dismantle their stations, remove antennas, and cease operations to prevent interference with Navy and Army signals critical for wartime coordination. This blackout, enforced by the Navy, which controlled radio communications, silenced an estimated 6,000 licensed hams and countless unlicensed operators, forcing many to store or repurpose their equipment. After the Armistice on November 11, 1918, hams, led by the American Radio Relay League (ARRL), lobbied for reinstatement. The ARRL, founded by Hiram Percy Maxim, emphasized amateur radio's value in training operators and advancing technology, citing contributions of hams who served as military radiomen. However, the Navy initially resisted, seeking to maintain control over radio spectrum for commercial and military use. Intense advocacy, including negotiations with Congress and the Department of Commerce, which would later regulate radio, highlighted the public interest in restoring amateur privileges. On October 1, 1919, the Navy lifted the ban allowing U.S. hams to resume operations. Stations were rapidly reassembled, and operators returned to the airwaves, revitalizing the hobby. This milestone, celebrated in QST, marked a turning point, reinforcing amateur radio's role in innovation and emergency communications, with hams quickly resuming experiments and DX contacts.

Post-World War II, the regulatory environment for radio frequencies was chaotic due to wartime expansions in broadcasting, military uses, and emerging technologies like LORAN navigation, which claimed the 160-meter band from amateurs. **The International Telecommunication Union (ITU)**, under the 1932 Madrid Convention, needed to update global allocations amid spectrum scarcity. The U.S. Federal Communications Commission (FCC), as the national regulator, prepared for international conferences to reorganize frequencies based on modern engineering, prioritizing commercial broadcasting and avoiding interference.

The 1947 International Radio Conference in Atlantic City (May–October), alongside ITU's Telecommunication and High Frequency Broadcasting conferences, involved FCC representatives in the U.S. delegation. Discussions focused on reallocating high-frequency bands for efficient global use. Amateur Radio Operators, represented by **ARRL** and **IARU**, advocated to retain spectrum, but concessions were made: the top 300 kHz of the 10-meter band (29.7–30 MHz) was lost to other services, and 50 kHz of the 20-meter band (14.35–14.4 MHz) was reduced for broadcasting needs. In compensation, the 15-meter band (21–21.45 MHz) was allocated to hams, compensating for prior losses like 160 meters. The FCC later granted shared access to the 11-meter band (26.96–27.23 MHz) with ISM devices as further offset, though interference limited its popularity until

EARLY AMATEUR RADIO TESTING

The use of Continuous Wave (CW) Morse code tests for U.S. amateur radio licensing began formally with the Radio Act of 1912, which introduced federal regulation of radio and required licenses for amateur operators. Prior to 1912, the airwaves were unregulated, and hams operated freely, often using spark-gap transmitters for Morse code.

The 1912 Act, prompted by spotlight on ham radio after the Titanic disaster, was born out of concern for potential interference with maritime and commercial signals. The Act mandated that amateurs demonstrate technical and operating proficiency, including Morse code, to secure a license.

The U.S. Department of Commerce, which initially oversaw radio licensing, required amateurs to prove their ability to send and receive Morse code. By 1913, the first standardized licensing exams included a Morse code test, as CW was the primary mode of amateur communication. When the FCC assumed regulatory control in 1934 under the Communications Act, it continued and refined the CW testing requirement. The early CW test, from 1912 through the 1920s and into the 1930s, assessed an operator's ability to send and receive Morse code accurately, reflecting the era's reliance on telegraphy for long-distance communication. Details of the test included:

- **Speed:** Initially, the test required about 5 words per minute (WPM), equivalent to 25 characters per minute, as this was sufficient for basic communication. By the 1930s, as licensing tiers developed, higher classes like Amateur First Class (pre-1934) required up to 10–12 WPM.

- **Format:** The test was administered in person by a Department of Commerce (later FCC) examiner, typically at a regional office. Candidates sent and received a mix of letters, numbers, and punctuation in Morse code.

Sending: Operators used a telegraph key to transmit a sample message, often a short plain-text phrase or random character groups, ensuring clear and accurate keying.

Receiving: Candidates listened to a Morse code transmission (via headphones or speaker) and transcribed it by hand. Accuracy was critical; errors could lead to failure.

- **Content:** Early tests used simple text or random five-character groups to mimic real-world QSOs (conversations). Punctuation and prosigns (e.g., CQ, SK) were included to test practical skills.

- **Environment:** Tests occurred in controlled settings, often with basic equipment like a straight key and oscillator. Applicants needed to demonstrate proficiency under pressure, as exams were timed and scored for errors.

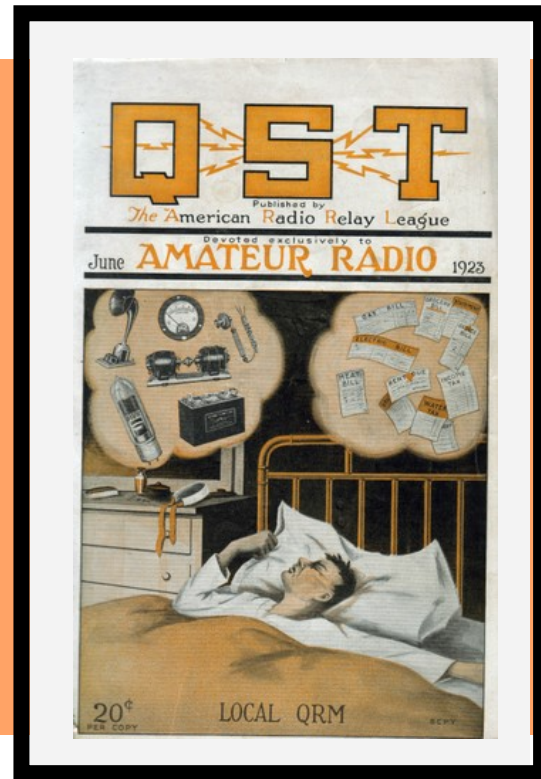
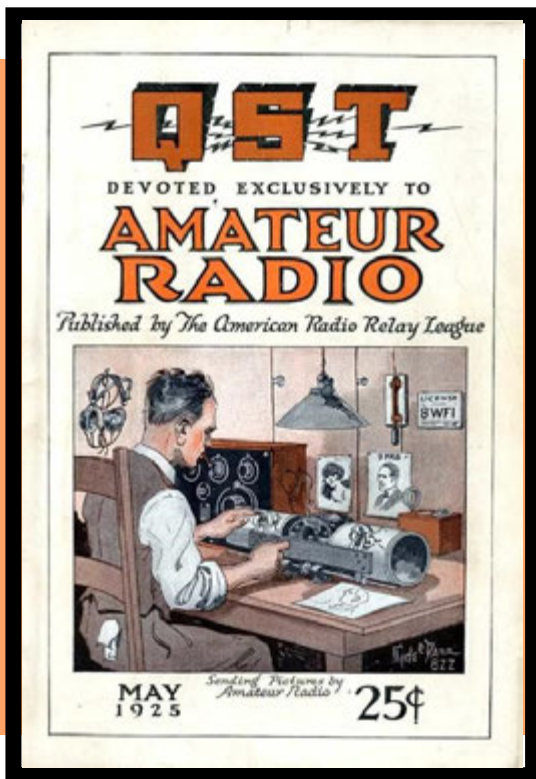
- **Purpose:** The CW test ensured operators could communicate reliably on crowded, interference-prone bands (e.g., 160 meters, 80 meters), where Morse was the most efficient mode before voice modulation became widespread.

By the 1930s, as license classes formalized (e.g., Class A, B, C), CW requirements increased for higher tiers, with speeds like 13 WPM for Class A (predecessor to General/Advanced) by the 1940s. The test remained a cornerstone of licensing until the FCC began phasing out Morse requirements, starting with the no-code Technician in 1991 and ending entirely in 2007, reflecting the rise of voice and digital modes. The early CW test was a rite of passage, fostering discipline and skill among hams, many of whom took pride in mastering the "fist" that defined the hobby's early years.

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1958. Reasoning centered on accommodating postwar broadcast growth while preserving amateur experimentation, which proved to be wholly unsuccessful. Ham Radio “experimentation” was hardly an apt description of what amateur radio operators endured. In fact, these changes produced a problematic timespan when amateur radio operators encountered a tremendous amount of frustration as they were relegated to joint access of the 11-meter band. Many of our WWII veterans returned to everyday life and looked forward to resuming their ham radio hobby, which had definitely changed. Clearly, the FCC miscalculated the situation.



Trying Times for Amateur Radio Band Access

In 1947, following the Atlantic City Conference, the U.S. Federal Communications Commission (FCC) granted amateur radio operators **shared access** to the 11-meter band (26.96–27.23 MHz) as partial compensation for spectrum losses in the 10-meter and 20-meter bands. This band was shared with Industrial, Scientific, and Medical (ISM) devices, such as diathermy machines and industrial heaters, which emitted radio frequency energy and caused **significant interference**.

The shared allocation aimed to balance amateur needs with other spectrum demands, but **the practical experience for hams was challenging**. For the average ham radio operator in the late 1940s, accessing the 11-meter band required adapting or building equipment, as most existing gear was tuned for other bands like 10 or 20 meters. Homebrew enthusiasts modified war-surplus or custom rigs to operate on 11 meters, tweaking oscillators and antennas to handle the 26–27 MHz range. Commercial transceivers from companies like Hallicrafters or Hammarlund were less common for this band initially, so many hams relied on technical ingenuity, often consulting QST articles for circuit designs. However, ISM interference—random, high-powered noise from nearby medical or industrial equipment—**frequently disrupted communications, making reliable DX or local contacts difficult**. Operators needed robust receivers with good selectivity to filter out noise, and many found the band less appealing than the cleaner 15-meter allocation.

By 1958, the FCC reallocated 11 meters to the Citizens Band (CB) service, ending amateur access due to growing commercial demand and interference issues. **For hams, the 11-meter experiment was a brief, often frustrating chapter, pushing many toward more stable bands or commercial gear as the 1950s progressed.**

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Ham Radio in the 1950's

Before single-sideband (SSB) emerged in the 1950s, ham radio operators had primarily used amplitude modulation (AM) and continuous wave (CW) for voice and Morse code communications, respectively. SSB, developed in the 1920s but refined for ham use post-WWII, gained traction in the 1950s for its efficiency, requiring less power and spectrum while offering clearer signals in crowded bands like 20 meters. By the mid-1950s, companies like Collins introduced SSB transceivers (e.g., KWM-1 in 1957), followed by Heathkit (SB-series) and Drake (TR-3). These integrated SSB, AM, and CW, simplifying operation. Precise market share data is scarce, but QST articles and ARRL reports suggest SSB adoption grew rapidly: by the late 1950s, roughly 20–30% of U.S. hams used SSB on HF bands, rising to over 60% by the mid-1960s as AM declined due to SSB's superior performance in DX and contests. Homebrewing waned as affordable, reliable SSB transceivers from Hallicrafters, Hammarlund, and Heathkit dominated, reflecting a shift to commercial gear.

1960's and 1970's: A New Era in Ham Radio

Amateur Radio as a hobby had definitely transitioned to the heavy use of pre-made commercial gear. A new generation of hams were **born during or after** WWII, rather than **serving in** the war. With post-war prosperity, Americans had access to an abundance of exciting technology for consumers. The market share of off the shelf ham radio equipment grew steadily. Correspondingly, from the 1960s onward, the U.S. regulatory environment for ham radio bands evolved

through FCC actions, attempting to balance amateur access with commercial and technological demands.

In the 1960s–1970s, VHF/UHF expansions included FM repeaters on 2 meters (144–148 MHz) and 70 cm (430–450 MHz), spurred by surplus commercial gear as FCC tightened commercial bandwidths. Remember the 11-meter band had already been fully reallocated to Citizens Band in 1958, predating but influencing later VHF growth.

1980's and Beyond

License restructuring in 1983–1991 simplified classes (Technician, General, Extra), granting Technicians full VHF/UHF access and HF privileges for Novices/Technicians via SSB/data modes. Morse code requirements ended for HF in 2003, broadening access.

Key band changes: Secondary access to 60 meters (5 MHz channels) in 2012 for CW/USB/digital modes, centered on specific frequencies with restrictions like one signal per channel. In 2023, baud rate limits were replaced by 2.8 kHz bandwidth caps in HF data segments for flexible modes like PACTOR or MT63. Low bands like 2200 m (135.7–137.8 kHz) and 630 m (472–479 kHz) gained secondary access in 2017, requiring notification to utilities.

Proposed Changes: Recent FCC proposals for 60 meters (e.g., expanding channels or modes) have drawn ARRL comments urging protection. ARRL has raised alarms over interference from modern tech, notably LED lighting (bulbs, signs, grow lights) causing RFI on HF/VHF bands like 2 meters due to poor shielding in drivers. FCC has penalized non-compliant LED marketers for emissions violating Part 15 rules, as they risk harming licensed services. Other concerns include power-line noise, DSL/VDSL, and solar inverters, with the ARRL

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advocating FCC enforcement and mitigation tech. According to advocates at ARRL, these issues underscore hams' secondary status in many bands, prioritizing interference-free ops. To be sure, technology is ever-evolving and the digital age has accelerated challenges in our everyday lives. For the average American ham radio operator, modern household electronics like LED lighting, solar panels, and nearby power lines can generate radio frequency interference (RFI), disrupting HF and VHF operations, so the ARRL is right. LED bulbs and signs, particularly those with poorly designed switching power supplies, emit broadband noise that can blanket bands like 80 meters or 2 meters, causing static or reduced signal clarity. Solar panel inverters, especially budget models, produce RFI from pulse-width modulation, affecting nearby receivers. Power lines, when poorly maintained or arcing, generate persistent noise across HF bands.

Radio Frequency Interference Mitigation Tips

To mitigate, hams should first identify RFI sources using a portable receiver or loop antenna to pinpoint noisy devices. For LED lights, switching to RF-quiet brands (e.g., Philips or GE models certified for low EMI) or adding ferrite chokes on power cords can suppress noise. Solar inverters require EMI filters or shielded cabling; consulting ARRL's RFI resources or manufacturers like SolarEdge for compliant models helps. For power-line noise, hams can report issues to utilities, as FCC Part 15 rules mandate interference resolution.

Station adjustments include using directional antennas to null out noise sources, installing low-pass or band-pass filters on transceivers, and grounding equipment properly to reduce stray RF. Digital modes like FT8, with robust error correction, can improve communication in noisy environments. Relocating antennas away from power lines or home electronics, ideally elevated or in quieter areas of the property, also minimizes interference. **ARRL's Technical Information Service** offers detailed guides for troubleshooting and mitigation.

Ham Radio Pioneers' Legacy Endures

From Hiram Percy Maxim's spark-gap rig, spitting erratic pulses into the ether, to the sleek SSB transceivers of the 1950s, the legacy of ham radio pioneers lives in every CQ call we make, a testament to those early dreamers who built their own gateways to the world. They opened the door for us, the modern generation of wide-eyed amateur radio operators, who share their heart of exploration and experimentation.

Today, in suburban garages, rural shacks, and city apartments, we carry forward their spirit, wielding software-defined radios and digital modes like FT8, connecting across continents with a few watts and a wire.

The airwaves now hum with signals that dance from 160 meters to 70 centimeters, linking us to distant stations in a global chorus of voices, beeps, and data bursts.

We, too, are builders of sorts, whether crafting a dipole from scrap or programming a Raspberry Pi for digital modes. The early tinkerers would marvel at our tools—compact transceivers from Yaesu and Icom, antennas optimized for 60-meter channels, and satellites like OSCAR that carry our signals into space.

We operate on 10 meters with SSB, tap out CW on 40 meters, or experiment with PACTOR on 20 meters, all while dodging power-line noise. Our community thrives in events like Jamboree on the Air or ARISS SSTV downloads, connecting us to the International Space Station, a feat unimaginable to those early hams.

Their legacy is our call to innovate—adapting to 5G's encroachment on 3.3 GHz or mastering low-power QRP to work the world with a whisper. We honor them in emergency nets, like those activated during Hurricane Helene, where ARES operators relayed critical messages, proving ham radio's enduring role in crises. Every antenna we raise, every QSO we log, is a nod to those who soldered by lamplight, driven by curiosity. Today, we stand on their shoulders, our signals soaring through the same heavens, weaving a tapestry of connection that spans time and space, forever linking us to the dreamers who first heard the world's heartbeat in the sound of a Morse code pulse. ★





Contest Calendar - October 2025

<u>+ Phone Weekly Test</u>	0230Z-0300Z, Oct 1
<u>+ A1Club AWT</u>	1145Z-1300Z, Oct 1
<u>+ CWops Test (CWT)</u>	1300Z-1400Z, Oct 1
<u>+ Mini-Test 40</u>	1700Z-1759Z, Oct 1
<u>+ VHF-UHF FT8 Activity Contest</u>	1700Z-2100Z, Oct 1
<u>+ Mini-Test 80</u>	1800Z-1859Z, Oct 1
<u>+ CWops Test (CWT)</u>	1900Z-2000Z, Oct 1
<u>+ UKEICC 80m Contest</u>	2000Z-2100Z, Oct 1
<u>+ Walk for the Bacon QRP Contest</u>	0000Z-0100Z, Oct 2 and 0200Z-0300Z, Oct 3
<u>+ CWops Test (CWT)</u>	0300Z-0400Z, Oct 2
<u>+ CWops Test (CWT)</u>	0700Z-0800Z, Oct 2
	1700Z-1800Z, Oct 2 (CW) and 1800Z-1900Z, Oct 2 (SSB) and 1900Z-2000Z, Oct 2 (FM) and 2000Z-2100Z, Oct 2 (Dig)
<u>+ NRAU 10m Activity Contest</u>	1700Z-2000Z, Oct 2
<u>+ SARL 80m QSO Party</u>	1900Z-2100Z, Oct 2
<u>+ SKCC Sprint Europe</u>	0000Z to 2400Z, Oct 3
<u>+ URC DX RTTY Contest</u>	0100Z-0130Z, Oct 3
<u>+ NCCC FT4 Sprint</u>	0145Z-0215Z, Oct 3
<u>+ Weekly RTTY Test</u>	0230Z-0300Z, Oct 3
<u>+ NCCC Sprint</u>	0700Z-1000Z, Oct 3
<u>+ German Telegraphy Contest</u>	2000Z-2100Z, Oct 3
<u>+ K1USN Slow Speed Test</u>	0000Z, Oct 4 to 2359Z, Oct 5
<u>+ Collegiate QSO Party</u>	0600Z, Oct 4 to 0559Z, Oct 5
<u>+ Worked All Provinces of China DX Contest</u>	0600Z, Oct 4 to 0600Z, Oct 5
<u>+ Oceania DX Contest, Phone</u>	0600Z, Oct 4 to 1800Z, Oct 5
<u>+ TRC DX Contest</u>	1200Z, Oct 4 to 1159Z, Oct 5
<u>+ Russian WW Digital Contest</u>	1400Z, Oct 4 to 1400Z, Oct 5
<u>+ IARU Region 1 UHF/Microwaves Contest</u>	

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Contest Calendar - October 2025

[+ International HELL-Contest](#)

[+ California QSO Party](#)

[+ IARU Region 2 Area G HF SSB Contest](#)

[+ UBA ON Contest, SSB](#)

[+ Peanut Power QRP Sprint](#)

[+ K1USN Slow Speed Test](#)

[+ ICWC Medium Speed Test](#)

[+ OK1WC Memorial \(MWC\)](#)

[+ ICWC Medium Speed Test](#)

[+ RSGB 80m Autumn Series, CW](#)

[+ ARS Spartan Sprint](#)

[+ Worldwide Sideband Activity Contest](#)

[+ ICWC Medium Speed Test](#)

[+ Phone Weekly Test](#)

[+ A1Club AWT](#)

[+ CWops Test \(CWT\)](#)

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

[+ Mini-Test 40](#)

[+ Mini-Test 80](#)

[+ CWops Test \(CWT\)](#)

[+ 432 MHz Fall Sprint](#)

[+ CWops Test \(CWT\)](#)

[+ CWops Test \(CWT\)](#)

[+ 10-10 Int. 10-10 Day Sprint](#)

[+ NCCC FT4 Sprint](#)

[+ Weekly RTTY Test](#)

[+ NCCC Sprint](#)

[+ K1USN Slow Speed Test](#)

[+ Makrothen RTTY Contest](#)

1600Z-1800Z, Oct 4 (80m) and

0900Z-1100Z, Oct 5 (40m)

1600Z, Oct 4 to 2200Z, Oct 5

2200Z-2359Z, Oct 4

0600Z-1000Z, Oct 5

2200Z-2359Z, Oct 5

0000Z-0100Z, Oct 6

1300Z-1400Z, Oct 6

1630Z-1729Z, Oct 6

1900Z-2000Z, Oct 6

1900Z-2030Z, Oct 6

0000Z-0200Z, Oct 7

0100Z-0159Z, Oct 7

0300Z-0400Z, Oct 7

0230Z-0300Z, Oct 8

1145Z-1300Z, Oct 8

1300Z-1400Z, Oct 8

1700Z-2100Z, Oct 8

1700Z-1759Z, Oct 8

1800Z-1859Z, Oct 8

1900Z-2000Z, Oct 8

2300Z, Oct 8 to 0600Z, Oct 9

0300Z-0400Z, Oct 9

0700Z-0800Z, Oct 9

0001Z-2359Z, Oct 10

0100Z-0130Z, Oct 10

0145Z-0215Z, Oct 10

0230Z-0300Z, Oct 10

2000Z-2100Z, Oct 10

0000Z-0800Z, Oct 11 and

1600Z-2400Z, Oct 11 and

0800Z-1600Z, Oct 12

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Contest Calendar - October 2025

<u>+ QRP ARCI Fall QSO Party</u>	0000Z-2359Z, Oct 11
<u>+ ARRL EME Contest</u>	0000Z, Oct 11 to 2359Z, Oct 12
<u>+ Nevada QSO Party</u>	0300Z, Oct 11 to 2100Z, Oct 12
<u>+ Oceania DX Contest, CW</u>	0600Z, Oct 11 to 0600Z, Oct 12
<u>+ Scandinavian Activity Contest, SSB</u>	1200Z, Oct 11 to 1200Z, Oct 12
<u>+ SKCC Weekend Sprintathon</u>	1200Z, Oct 11 to 2400Z, Oct 12
<u>+ Arizona QSO Party</u>	1500Z, Oct 11 to 0500Z, Oct 12
<u>+ Pennsylvania QSO Party</u>	1600Z, Oct 11 to 0400Z, Oct 12 and 1300Z-2200Z, Oct 12
<u>+ South Dakota QSO Party</u>	1800Z, Oct 11 to 1800Z, Oct 12
<u>+ PODXS 070 Club 160m Great Pumpkin Sprint</u>	2000Z, Oct 11 to 2000Z, Oct 12
<u>+ UBA ON Contest, CW</u>	0600Z-1000Z, Oct 12
<u>+ 4 States QRP Group Second Sunday Sprint</u>	0000Z-0200Z, Oct 13
<u>+ K1USN Slow Speed Test</u>	0000Z-0100Z, Oct 13
<u>+ ICWC Medium Speed Test</u>	1300Z-1400Z, Oct 13
<u>+ OK1WC Memorial (MWC)</u>	1630Z-1729Z, Oct 13
<u>+ ICWC Medium Speed Test</u>	1900Z-2000Z, Oct 13
<u>+ Worldwide Sideband Activity Contest</u>	0100Z-0159Z, Oct 14
<u>+ ICWC Medium Speed Test</u>	0300Z-0400Z, Oct 14
<u>+ DARC RTTY Sprint</u>	1800Z-1929Z, Oct 14
<u>+ NAQCC CW Sprint</u>	0030Z-0230Z, Oct 15
<u>+ Phone Weekly Test</u>	0230Z-0300Z, Oct 15
<u>+ A1Club AWT</u>	1145Z-1300Z, Oct 15
<u>+ CWops Test (CWT)</u>	1300Z-1400Z, Oct 15
<u>+ Mini-Test 40</u>	1700Z-1759Z, Oct 15
<u>+ VHF-UHF FT8 Activity Contest</u>	1700Z-2100Z, Oct 15
<u>+ Mini-Test 80</u>	1800Z-1859Z, Oct 15
<u>+ CWops Test (CWT)</u>	1900Z-2000Z, Oct 15
<u>+ RSGB 80m Autumn Series, Data</u>	1900Z-2030Z, Oct 15
<u>+ AGCW Semi-Automatic Key Evening</u>	1900Z-2030Z, Oct 15
<u>+ Walk for the Bacon QRP Contest</u>	0000Z-0100Z, Oct 16 and 0200Z-0300Z, Oct 17

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Contest Calendar - October 2025

<u>+ CWops Test (CWT)</u>	0300Z-0400Z, Oct 16
<u>+ CWops Test (CWT)</u>	0700Z-0800Z, Oct 16
<u>+ NTC QSO Party</u>	1900Z-2000Z, Oct 16
<u>+ NCCC FT4 Sprint</u>	0100Z-0130Z, Oct 17
<u>+ Weekly RTTY Test</u>	0145Z-0215Z, Oct 17
<u>+ NCCC Sprint</u>	0230Z-0300Z, Oct 17
<u>+ K1USN Slow Speed Test</u>	2000Z-2100Z, Oct 17
<u>+ JARTS WW RTTY Contest</u>	0000Z, Oct 18 to 2400Z, Oct 19
<u>+ 10-10 Int. Fall Contest, CW</u>	0001Z, Oct 18 to 2359Z, Oct 19
<u>+ New York QSO Party</u>	1400Z, Oct 18 to 0200Z, Oct 19
<u>+ YLRL DX/NA YL Anniversary Contest</u>	1400Z, Oct 18 to 0200Z, Oct 20
<u>+ Stew Perry Topband Challenge</u>	1500Z, Oct 18 to 1500Z, Oct 19
<u>+ Worked All Germany Contest</u>	1500Z, Oct 18 to 1459Z, Oct 19
<u>+ Feld Hell Sprint</u>	2000Z-2359Z, Oct 18
<u>+ Argentina National 7 MHz Contest</u>	2130Z-2330Z, Oct 18
<u>+ Asia-Pacific Fall Sprint, CW</u>	0000Z-0200Z, Oct 19
<u>+ UBA ON Contest, 2m</u>	0700Z-1000Z, Oct 19
<u>+ Illinois QSO Party</u>	1700Z, Oct 19 to 0100Z, Oct 20
<u>+ Run for the Bacon QRP Contest</u>	2300Z, Oct 19 to 0100Z, Oct 20
<u>+ K1USN Slow Speed Test</u>	0000Z-0100Z, Oct 20
<u>+ ARRL School Club Roundup</u>	1300Z, Oct 20 to 2359Z, Oct 24
<u>+ ICWC Medium Speed Test</u>	1300Z-1400Z, Oct 20
<u>+ OK1WC Memorial (MWC)</u>	1630Z-1729Z, Oct 20
<u>+ ICWC Medium Speed Test</u>	1900Z-2000Z, Oct 20
<u>+ Worldwide Sideband Activity Contest</u>	0100Z-0159Z, Oct 21
<u>+ ICWC Medium Speed Test</u>	0300Z-0400Z, Oct 21
<u>+ SKCC Sprint</u>	0000Z-0200Z, Oct 22
<u>+ Phone Weekly Test</u>	0230Z-0300Z, Oct 22
<u>+ A1Club AWT</u>	1145Z-1300Z, Oct 22
<u>+ CWops Test (CWT)</u>	1300Z-1400Z, Oct 22
<u>+ Mini-Test 40</u>	1700Z-1759Z, Oct 22

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Contest Calendar - October 2025

<u>+ Mini-Test 80</u>	1800Z-1859Z, Oct 22
<u>+ CWops Test (CWT)</u>	1900Z-2000Z, Oct 22
<u>+ IRTS 80m Counties Contest</u>	2000Z-2100Z, Oct 22
<u>+ CWops Test (CWT)</u>	0300Z-0400Z, Oct 23
<u>+ CWops Test (CWT)</u>	0700Z-0800Z, Oct 23
<u>+ RSGB 80m Autumn Series, SSB</u>	1900Z-2030Z, Oct 23
<u>+ NCCC FT4 Sprint</u>	0100Z-0130Z, Oct 24
<u>+ Weekly RTTY Test</u>	0145Z-0215Z, Oct 24
<u>+ NCCC Sprint</u>	0230Z-0300Z, Oct 24
<u>+ Zombie Shuffle</u>	1500-2400 local, Oct 24
<u>+ K1USN Slow Speed Test</u>	2000Z-2100Z, Oct 24
<u>+ CQ Worldwide DX Contest, SSB</u>	0000Z, Oct 25 to 2359Z, Oct 26
<u>+ 902 MHz and Up Fall Sprint</u>	0800 local - 1400 local, Oct 25
<u>+ Classic Exchange, CW</u>	1300Z, Oct 26 to 0700Z, Oct 27 and 1300Z, Oct 28 to 0700Z, Oct 29
<u>+ K1USN Slow Speed Test</u>	0000Z-0100Z, Oct 27
<u>+ ICWC Medium Speed Test</u>	1300Z-1400Z, Oct 27
<u>+ QCX Challenge</u>	1300Z-1400Z, Oct 27
<u>+ OK1WC Memorial (MWC)</u>	1630Z-1729Z, Oct 27
<u>+ ICWC Medium Speed Test</u>	1900Z-2000Z, Oct 27
<u>+ QCX Challenge</u>	1900Z-2000Z, Oct 27
<u>+ RSGB FT4 Contest</u>	2000Z-2200Z, Oct 27
<u>+ Worldwide Sideband Activity Contest</u>	0100Z-0159Z, Oct 28
<u>+ ICWC Medium Speed Test</u>	0300Z-0400Z, Oct 28
<u>+ QCX Challenge</u>	0300Z-0400Z, Oct 28

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Contest Calendar - October 2025

<u>+ Phone Weekly Test</u>	0230Z-0300Z, Oct 29
<u>+ A1Club AWT</u>	1145Z-1300Z, Oct 29
<u>+ CWops Test (CWT)</u>	1300Z-1400Z, Oct 29
<u>+ Mini-Test 40</u>	1700Z-1759Z, Oct 29
<u>+ Mini-Test 80</u>	1800Z-1859Z, Oct 29
<u>+ CWops Test (CWT)</u>	1900Z-2000Z, Oct 29
<u>+ UKEICC 80m Contest</u>	2000Z-2100Z, Oct 29
<u>+ CWops Test (CWT)</u>	0300Z-0400Z, Oct 30
<u>+ CWops Test (CWT)</u>	0700Z-0800Z, Oct 30
<u>+ NCCC FT4 Sprint</u>	0100Z-0130Z, Oct 31
<u>+ Weekly RTTY Test</u>	0145Z-0215Z, Oct 31
<u>+ NCCC Sprint</u>	0230Z-0300Z, Oct 31
<u>+ K1USN Slow Speed Test</u>	2000Z-2100Z, Oct 31

Our thanks to
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Visit Bruce at www.contestcalendar.com/contestcal.html

The ARAC RELAY



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