



The RELAY)))

JULY
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

| | |
|----------------------|-----|
| Antenna Restrictions | 1 |
| Board Mtg Minutes | 2-3 |
| Club Mtg Minutes | 4-5 |
| Prez Sez | 5 |
| Lift Bridge Event | 6 |
| MARS | 7 |
| Contest Calendar | 8 |
| CW Abbreviations | 9 |
| Band Plan | 9 |
| Nets | 10 |
| Upcoming Events | 11 |
| Repeaters | 12 |
| Membership | 13 |
| Calendar | 14 |
| Committee Chairs | 15 |
| Stealth Antennas | 17 |

Antenna Restrictions by Local Authorities or Covenants? Understand Your Rights

By Steve Waller KEØNQT
& Kim Waller KEØNQS

As an amateur radio operator, erecting an antenna at your residence should be an exciting part of the hobby. Selecting the type of antenna appropriate for your ham shack, acquiring the necessary hardware and planning the build with your fellow Hams can be a lot of fun. As any seasoned Ham will tell you, however, the process can be more complicated depending upon where you live. Everyone seems to know someone who has experienced some measure of difficulty from a city, town, township, county, HOA Board, landlord or neighbor. Antenna restrictions from local government zoning ordinances are common and Covenant, Conditions and Restrictions (CC&Rs) or lease agreements might govern your residence if it is a condo, townhome, planned community or apartment.

When dealing with local zoning authorities, understanding the FCC's PRB-1 document is essential. **PRB-1** is an 11 page Amateur Radio Memorandum Opinion and Order that was released in 1985 and it is still valid today.

PRB-1, in essence, states that federal law pre-empts state and city law and that since amateur radio operators are under federal license, they are subject only to building codes with respect to safe antenna installation and height restrictions. Building permit fees must be reasonable. Reasonable cost means they should be in line with those fees of surrounding commu-

nities. Having federal law on your side is step one, but then it may be necessary to "prove your case" to your local planning board or other jurisdictional entity. There may be misconceptions on the part of your governing board regarding



Canoe Antenna—Timothy Sammons, N6CC, San Ramon, CA
17 foot aluminum canoe mounted on black plastic rack-mounts = a quarter wave horizontal mobile antenna for the 20 meter Ham band. It worked fine with a little help from impedance matching!

Continued on Page 16



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ARAC Board Meeting Minutes for June 4, 2019

Present: Gene Ellefsen-NØVRM, Mike Lovold-NØPDG, Bruce Carlson-KEØNIT, Gary Minter-KD9ABS, Dave Davis-AAØAC, Bob Boyd-KDØYLN, Randy Wabik-KRØB, Doug Nelson-AAØAW, Grant Forsyth-KCØWUP, Bob Schultz-KCØNFB, Robin Davis

Guest: Dennis Anderson-WØDIO, Diane Saunders-KØDSL, Del Minter-KEØCLI, Emery Davis

Called to order by President Gene-NØVRM at 6:32 pm

Minutes:

Minutes posted on the web page and in the newsletter. Gary-KD9ABS makes a motion to accept, Dave-AAØAC seconded, motion passed

Treasurer's Report:

Checking2,292.10
Savings4,869.17
Cash Subtotal.....\$7,098.67

Outstanding Check (Repeater # 1414) -1,100.00
Outstanding Check (Fairground Rent)..... -600.00
Outstanding Check (Coffee Pot)..... -163.59
Subtotal..... -\$1,863.69

Winter CD1,707.19
CD Subtotal.....\$1,707.19

Grand Total\$6,942.17

Motion to approve by Bob-KDØLYN, seconded by MikeNØPDG, motion passed

New Business:

Special Events:

90th Anniversary of the Duluth Aerial Lift Bridge, event is scheduled for August 17, 2019. Set up will begin at 7:00 am and ending at 6:00 pm off air and clean-up. Special Use Permit from Army Corp of Engineers to use their grounds has been obtained. Diane Saunders-KØDSL met with the Mark Bauer, Parking Director from City of Duluth, to request use of a portion of the parking lot for a portable tower system. Diane-KØDSL sent him an email detailing our plans and proposed time. Posters and QSL Cards have been designed for use. Open to General Class or higher - Technician can operate under direction of General or Extra. Side band, Digital or CW are the modes of operation that will be available for operators. Diane-KØDSL asked and received permission to use the City of Duluth Icon. QST has been notified and the Media will be notified. A Special Call Sign was applied for and received - NØB. The Tower will be set up Friday evening and marked off with cones and tape. The extent of the operating equipment is still to be determined. Anything needed from the Board or the Club? Just bodies to operate and assist in the setup and take down. This event will show case the Aerial Lift Bridge, City of Duluth and Ham Radio including ARAC. There will be no food at the event but there are several restaurants in the area. A canopy will be on the lawn of the museum. Motion that Club pick up the costs for the QSL card by Gary-KD9ABS, seconded by Bob-KDØLYN, motion passed to bring it up at the Club Meeting. Certificates will be Kim Waller-KEØNQS and Steve Waller-KE-NQT are out of town. The newslet-

Continued on Page 3

ARAC BOARD Meeting Minutes, Continued from Page 2

newsletter will be out very soon. They had a family emergency according to Mike-N0PDG

Field Day:

Al Nordin-WD0DBQ wants to be put together a small operating station for Field Day. He needs a generator and a computer for digital logging. Gene-N0VRM has called Spirit Mountain and left a message. He has not had a return call yet to determine if we can use their parking lot again this year. We haven't had a lot of interest in Field Day - organizing the event, getting the food, getting the trailers from the various Counties, etc. A lot of folks are involved in the Grandma's Marathon. Interested in events as long as they only have to attend and eat. Most attend and never lift a finger to set up or take down an event. It can be a lot of work. Only two (2) people spent the night to operate during Field Day last year – Doug-AA0AW and Diane-K0DSL. Proposal to bring it up at the meeting - quick organizing would be needed. Need a member of organization to pick up the equipment, be responsible for it on site and return it if we would like to use equipment and/or trailers from the various counties. Recommendation to forget about it this year with an eye towards the Field Day next year.

Hoping for some involvement from the new Hams in our Club. People have to remain interested and be willing to participate. We need people to set up and take down, not only to show up and eat. Further discussion at the General Membership meeting.

Repeater:

The Mahtowa Repeater site was visited yesterday to check out what was needed to program the new radio and install it. There is a big tree on one of the guide wires, which made it unsafe, on the south or southwest leg. There are four (4) to eight (8) trees in the pod but only one on the guide, pulling it down. Cliff Tanner, Bruce, Randy Johnson-AA0ME will meet Gene-N0VRM to try to get the tree off the guide wire safely. The UHF Radio is dead and beyond repair. Randy Haglin-N0BZZ checked and he will be able to wire the new radio and make everything work. The backup generator will not start on auto. Probably the relay went again. It starts on manual. Doug-AA0AW knows which relay went last time. There might be something else going on. There is an analog sensor that says something is going on - the generator is on. The generator does run and it powers everything. Randy-KR0B and Randy-N0BZZ will go back in a couple of weeks. Suggestion to get someone from Onen to service the generator. Geoff Bennett-KE0BNX could be a certified generator technician and he might be willing to take a look at the generator for the Club. He is Jonas Hansen -K0ILS's son-in-law.

Observation - there was a lot of other stuff in the Repeater site. APRS, two (2) Packet Modes, Vertical Antenna, etc. Cleanup could involve removing the Six (6) Meter Repeater. It is up and running. There is a 440 link in there tied into the system. What happens if somebody abandons his equipment for like ten (10) years, who owns it? Who maintains it? Does it belong to the Club? Talk to Pat Wilmers-KB0QYN to see if he wants to donate it to the Club. It could be a cool addition. Bud Fisher-N0GGF was the President when we bought the 440 link, antenna, etc., from Pinewood Learning Center

Testing:

June 25, 2019. 5:30 pm registration, 6:00 pm testing. General testing pool will change on July 1, 2019

Program:

June program will be Grandma's Marathon - Shane Bauer, Executive Director and Greg Haapala, Race Director will both be attending our June meeting. 20,202 registered runners this year. The Half Marathon has 9,500 and Full Marathon has 8,800, 5,000 registered for the Irvin 5K. There are enough volunteers this year as far as the communications portion of the races is concerned. Doug-AA0AW ordered the proper weather for the races

Newsletter:

Kim Waller-KE0NQS and Steve Waller-KE0NQT are interested in doing a video promotion of the Club and the variety of things we do as a Club. Doug-AA0AW will work on getting some letters from the various events where we provide communication, etc.

Motion to adjourn by Dave-AA0AC, seconded by Gary-KB9ABS, motion passed at 7:31 pm

ARAC Club Meeting Minutes

June 13, 2019

Present:

President Gene Ellefsen-N0VRM
Vice President Mike Lovold-N0PDG
Treasurer / Membership Bruce Carlson-KE0NIT
Third Year Board Gary Minter-KD9ABS
First Year Board Bob Boyd-KD0YLN
Chaplain (Visiting) Rolland Bockbrader-KB0CK
Parliamentarian Grant Forsyth-KC0WUP
Special Events – Open / Gene Ellefsen-N0VRM acting
Ham Fest / Education Bob Schultz-KC0NFB
Property / Picnic Scott Ahlgren-N0VYU
Repeater Randy Wabik-KR0B
Web Site Thomas Dorr-KE0RHA
Testing Doug Nelson-AA0AW

Absent:

Secretary Robin Davis
Second Year Board Dave Davis-AA0AC
Newsletter / Historian Kim Waller-KE0NQS
Newsletter Steve Waller-KE0NQT
Repeater Derek McCorison-W0DNF
Repeater Randy Haglin-N0BZZ

Meeting called to order at 7:00 by President Gene-N0VRM

Minutes:

Minutes were taken by Mike-N0PDG due to the Secretary's absence.

Treasurer's Report:

| | |
|--|-------------|
| Checking | 2,292.10 |
| Savings | 4,869.17 |
| Cash Subtotal..... | \$7,098.67 |
| | |
| Outstanding Check (Repeater # 1414) | -1,100.00 |
| Outstanding Check (Fairground Rent)..... | -600.00 |
| Outstanding Check (Coffee Pot)..... | -163.59 |
| Subtotal..... | -\$1,863.69 |
| | |
| Winter CD | 1,707.19 |
| CD Subtotal..... | \$1,707.19 |
| | |
| Grand Total | \$6,942.17 |

Motion to accept by Bob-KC0NFB, seconded by AA0ME, motion passed

Membership:

New member – William Owen, Jr-KC0AM

Repeater:

Mahtowa Repeater site had a tree fall on the Guy Wire, which will need to be inspected. The tree and all debris have been removed away from the Repeater site. The cost for the required inspection of the tower and

Continued on Page 5

ARAC Club Meeting Minutes, Continued from Page 4

guy wires is \$700.00. Motion to have the required inspection done by Doug-AA0AW, seconded by Mike-N0PDG, motion passed. Randy-KR0B said that the new Repeater should be up and running by next Club meeting in July

Special Events:

Special event scheduled for August 17, 2019, is in last stages of planning. It is to commemorate the 90th Anniversary of the Aerial Lift Bridge. Set up in the parking lot next to the Bridge will start on Saturday morning at 7:00 am, with the hope of being on the air by 9:00 am. The event will conclude done by 6:00 pm. A sign-up sheet going around for anyone interested in volunteering including operating while on the air. A portable tower will be available from the county. Questions? See Diane Saunders-K0DSL

Field Day:

Field Day participation on Saturday, June 22, 2019, will be available with special thanks to Al Nordin -WB0DBQ. He will setting up a radio and antenna, in the Spirit Mountain Parking lot and plans to make contacts throughout the Event. This year Field Day is on the same day as Grandmas Marathon

New Business:

July 13, 2019, will be date of the Eugene Curnow Trail Marathon and the Minnesota Voyager Trail Ultramarathon. Sam Carlson, the Race Director said all stations remain the same except for Seven Bridges Road Station and an alternate site will be announced

Meeting adjourned at 7:30pm

Prez Sez...

Hi everyone! I would like to thank all of you who volunteered go Grandma's Marathon this year. The weather turned out graet and all of you did a great job providing Health and Welfare communications forthe Marathon!

I would also like to send out a Thank You to the guys who put up a Field Day Station up at Spirit Mountain. This was one of those years where the Marathon and Field Day conflict. Al WB0DBQ, Pat KC0JRJ and Ray N0RCT put W0GKP on the air.

There were some visitors that came up and operated and shared some good food! They made over 280 contacts on SSB and FT8 Digital!

I think summer has finally arrived so everyone have a fun and safe summer !!

Gene N0VRM

Date: August 17, 2019 Time: 9:00 a.m. to 6:00 p.m.

Duluth Aerial Lift Bridge 90th Anniversary Special Event



Sponsors



N0EO
Spirit Valley
Amateurs



This special event commemorates the 90th Anniversary of the bridge (1929-2019). The original bridge built in 1905 was a transporter bridge, with a gondola to carry people and goods from Canal Park to Minnesota Point.

The bridge we see now is 501.4' long and 23' 11" wide. The bridge can be raised to its full height of 135 feet in about a minute, and is raised about 5,000 times per year. The span is about 390 feet (120 meters).

An amateur radio Special Event Station will be on site to operate and contact other amateur radio stations around the country to commemorate the anniversary of the bridge. Educational materials on the bridge will be available for the public, as well as materials on amateur radio. We invite all interested persons to attend.

There are many restaurants in the area for those who are interested. Amateur radio operators will be there as well to answer questions.

Directions: From the south: Drive North on I-35 to the Lake Avenue Exit in Duluth. Turn right onto Lake Avenue to Canal Park. There is street and parking lot parking available.

From the North: Drive south on Hwy 61 and continue to London Rd. At London Rd and Superior Street, you can either turn left on Superior St. or go up to 1st St to get away from traffic in Downtown Duluth. Continue to Lake Avenue, and turn left on Lake Avenue to Canal Park.

From Wisconsin, drive North on Hwy 53 to Superior or west on Hwy 2 to Superior. Continue on and drive over the Blatnick Bridge (Hwy I-535) to Duluth and proceed north to Canal Park as above.

Location:

U.S. Army Corps of Engineers Maritime Museum and Visitors Center, Canal Park, Duluth Minnesota. See Map for directions.

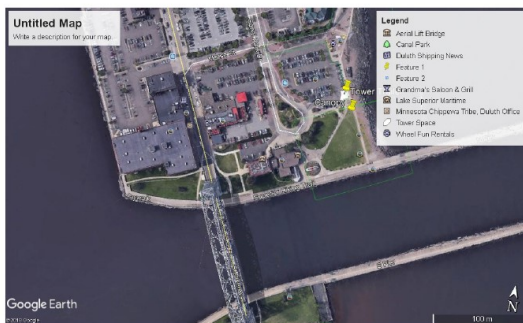
Contact person:

Diane Saunders

Phone: (763) 807-8772

Email:

ke0aqu@charter.net



Sponsors

American Radio Relay League (ARRL)

Minnesota Wireless Association (MWA)

Spirit Valley Amateurs Club

Arrowhead Radio Amateurs Club (ARAC)

City of Duluth MN

U.S. Army Corps of Engineers, Maritime Museum & Visitors Center

Lake County MN ARES/RACES

Acknowledgements

The organizer wishes to thank the U.S. Army Corps of Engineers, Maritime Museum and Visitors Center, The City of Duluth, Interstate Parking, Lake County ARES/RACES, all the amateur radio operators and others who are participating in the event for their generous time and help.

Callsigns: AA0AW, KC0NFB, KC0WDQ, W0NWO, KD0HHW, KC0MKS, NOVRM, AC0W

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 2019

JULY

| | |
|--------------------------------|--------------------------------------|
| CQ Worldwide VHF Contest | 1800 UTC July 20 to 2100 UTC July 21 |
| North American QSO Party, RTTY | 1800 UTC July 20 to 0559 UTC July 21 |

AUGUST

| | |
|--------------------------------------|------------------------------------|
| ARRL 222 MHz and Up Distance Contest | 1800 UTC Aug 3 to 1800 UTC Aug 4 |
| North American QSO Party, CW | 1800 UTC Aug 3 to 0600 UTC Aug 4 |
| Maryland-DC QSO Party | 1600 UTC Aug 10 to 2400 UTC Aug 11 |
| Rookie Roundup RTTY | 1800 UTC to 2359 UTC Aug 18 |
| Hawaii QSO Party | 0400 UTC Aug 24 to 0400 UTC Aug 26 |
| Ohio QSO Party | 1600 UTC Aug 24 to 0400 UTC Aug 25 |

SEPTEMBER

| | |
|-------------------------|--------------------------------------|
| Tennessee QSO Party | 1800 UTC Sept 1 to 0300 UTC Sept 2 |
| New Hampshire QSO Party | 1600 UTC Sept 21 to 2200 UTC Sept 22 |
| Maine QSO Party | 1200 UTC Sept 28 to 1200 UTC Sept 29 |
| Texas QSO Party | 1400 UTC Sept 28 to 2000 UTC Sept 29 |

CW Abbreviations

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

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



US Amateur Radio Bands

US AMATEUR POWER LIMITS

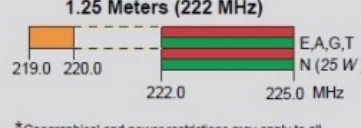
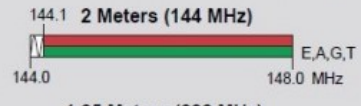
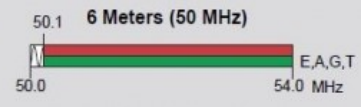
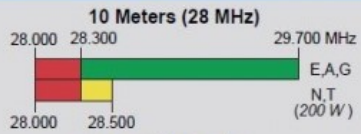
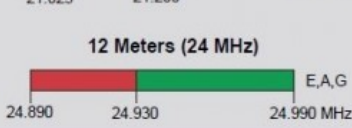
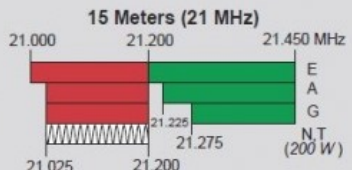
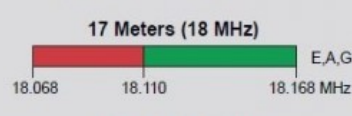
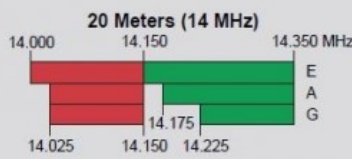
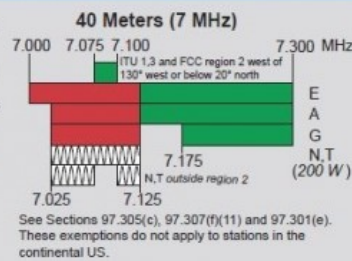
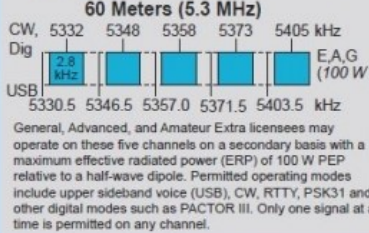
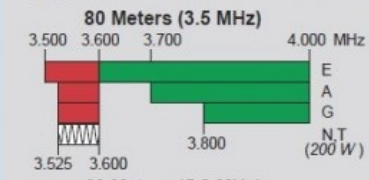
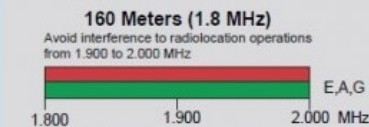
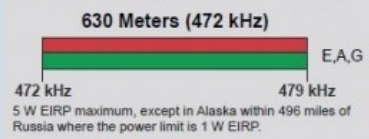
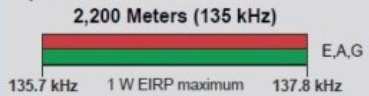
FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

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

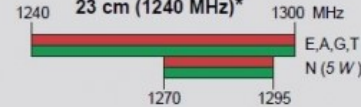
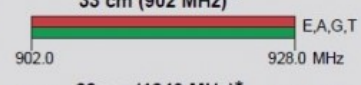
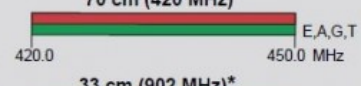


The national association for
ARRL AMATEUR RADIO

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

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

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Membership/Circulation Desk:
www.arrl.org/membership
Toll-Free 1-888-277-5289 (860-594-0338)
email: membership@arrl.org

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

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

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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

Wanted!

Looking to buy a non-working Icom 706 for parts. Email me: anordin@aol.com

Please email your for sales or wanted items to Kim, KE0NQS, at KE0NQS.mn@gmail.com.

KC0NFB, 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.

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.

Club Repeater

W0GKP

146.94 (-)

CTCSS Tone

103.5

Next ARAC Board Meeting

**Tuesday, July 2, 2019
@ 1830
Sammy's West Duluth**

Next ARAC Club Meeting

**7 p.m. Thursday
July 11, 2019
Copper Top Church**

2019 HOLIDAYS

| | |
|--------------------|-------------------------|
| July 4 | Independence Day |
| September 2 | Labor Day |
| November 11 | Veteran's Day |
| November 28 | Thanksgiving |
| December 25 | Christmas Day |

Upcoming 2019 Local Events

Confirmed Dates for 2019 (Correct as of publication)

- **August 17- Duluth Lift Bridge
90th Anniversary
Special Event**

Upcoming 2019 Meeting Programs

TBD

Interested in providing a program, or have an idea for one? Contact Mike N0PDGP 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-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.

| <u>Name</u> | <u>Call</u> | <u>Expertise</u> |
|--------------|-------------|--|
| 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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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 me with your info. If you need to make a change, please let us know at KEØNQSmn@gmail.com Or KEØNQT@gmail.com

Co-Editors,
Kim & Steve Waller
KEØNQS & KEØNQT



The greatest gift of life is friendship,
and I have received it.
Hubert H. Humphrey

BrainyQuote

JULY

CLUB EVENTS

SUNDAY NIGHT NETS

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

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 |
|--|---|---|--|--|-----|--|
| CW 1930 AA0AW USB 2000 AA0AW ES 2100 N9DMG | 1 WX 2000 KC0MKS | 2 ARAC BOARD MEETING 1900 Sammy's West Duluth DC Net 2000 CC Net 2030 | 3 Lake County Net 1900 | | | |
| 7 CW 1930 N0PDG USB 2000 N0PDG ES 2100 K0DSL | 8 DC ARES/RACES Mtg 1900 DC EOC WX 2000 KC0MKS | 9 DC Net 2000 CC Net 2030 | 10 Lake County ARES/RACES Meeting 1800 Lake County Net 1900 | 11 ARAC Club Meeting @ 1900 Coppertop | | |
| 14 CW 1930 AA0AW USB 2000 AA0AW ES 2100 AA0ME | 15 WX 2000 KC0MKS | 16 DC Net 2000 CC Net 2030 | 17 St. Louis County ARES/RACES Mtg 1630 Pike Lake EOC | | | |
| 21 CW 1930 N0PDG USB 2000 W0LWU ES 2100 N9DMG | 22 WX 2000 KC0MKS | 23 DC Net 2000 CC Net 2030 | 24 Lake County Net 1900 | 25 Carlton County ARES/RACES Meeting 1900 CC EOC | | 27 Club Breakfast @ The Chalet 0730-0800 |
| 28 CW 1930 AA0AW USB 2000 K9KDK ES 2100 AA0AW | 29 | 30 | 31 | | | |

Get this newsletter *faster*
via email!

Email Doug AAØAW at
aa0aw@chartermi.net

Next Meeting: Thursday,
JULY 11, 2019 - 7 pm

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:

Terrance Thompson KAØTST, upgraded from General to Extra Class

New Ham: Sue Schotz - Call Sign TBD

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:

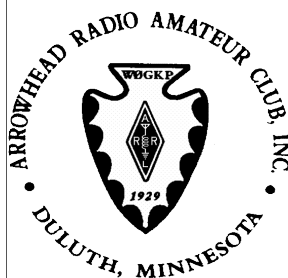
Dennis Anderson WØDIO

Picnic Chair:

Scott Ahlgren, NØVYU

Repeater Chairs:

Randy Haglin NØBZZ
Randy Wabik KAØJZV



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.



Antenna Restrictions, Continued from Page 1

“your rights as a federal licensee that you can proactively and respectfully address in your permit application and presentation.

Sometimes local zoning entities overstep their legal authority due to a misunderstanding of their jurisdictional powers with regard to ham radio antennas. As such, a ham operator must be prepared to provide documentation necessary to respectfully inform officials about PRB-1 compliance. PRB-1 provides that an amateur station antenna structure **may be erected at heights and dimensions sufficient to accommodate effective amateur service communications**. So, local authorities may adopt regulations pertaining to placement, screening, or height of antennas, **if** such regulations are based on health, safety, or aesthetic considerations **and** reasonably accommodate amateur communications.

Additionally, local governments may not base their regulation of amateur service antenna structures on the causation of radio frequency interference to home electronic equipment. RFI is regulated **exclusively** by the FCC.

Some local governments incorrectly believe that if an amateur radio antenna is lowered, the potential for interference decreases. The FCC has gone on record as stating that there is no reasonable connection between requiring an amateur radio operator to reduce the height of his or her tower and reducing the amount of interference to a neighbor's home electronic equipment. On the contrary, antenna height is inversely related to the strength of the radio signal that serves as a catalyst for interference in susceptible home electronic equipment. **The higher that antenna is, the farther away is it from consumer equipment, and the less the interference potential is.** So as a matter of technical fact, the higher an amateur antenna, the less likely it is that RFI will appear in home electronic equipment. This statement was made in an October 25, 1994 letter from former FCC Private Radio Bureau Chief Ralph Haller, which can be found on the ARRL website.

In preparation for discussion with your local authority, ARRL's Regulatory Information Branch has a couple of helpful PRB-1 information packets. A smaller, PRB-1 packet can be found on ARRL's website. The larger PRB-1 package consists of more than 200 pages

of cases, sample ordinances, a communications height effectiveness study as well as the text of PRB-1 and other helpful info and is available for a modest fee. Visit <http://www.arrl.org/prb-1> for more information or use the search tool at [arrl.org](http://www.arrl.org).

ARRL also has **Volunteer Counsels**--Hams that are lawyers—to give you additional legal guidance if needed. Go to <http://www.arrl.org/volunteer-counsel-program> to see a list of volunteers for you to contact. Need some additional technical advice regarding to your antenna permit? Visit <http://www.arrl.org/volunteer-consulting-engineer-program> for a list of **ARRL Volunteer Consulting Engineers**. They're amateur radio operators who are also professional engineers and are there to help.

Facing obstacles with Covenants or HOAs at your condo, townhome, planned community or apartment? PRB-1 does not govern your situation, but the **Amateur Radio Parity Act of 2019 (ARPA)** is currently in the committee process of Congress, having been introduced earlier this year in the legislative session. Though past versions of the bill were not passed, newly-elected advocates in the legislature increase the chances of it becoming law sometime this year.



A vertically retractable antenna suggestion posted by James Southwick N7JS of Ogden, UT

Continued on Page 17

Antenna Restrictions, Continued from Page 16

What would the Amateur Radio Parity Act do? Historically Federal Courts have been largely reluctant to intervene in the matters of Covenants, seeing them as contracts between private individuals in which the Federal Government has no stake. While the FCC does have the jurisdiction to limit covenants where they obviously conflict with Federal telecommunications policy, that jurisdiction is exercised very seldom.

The Parity Act would **guarantee** every single radio amateur who lives in a deed-restricted community the right to erect and maintain an “effective outdoor antenna on property under the exclusive use or control of the licensee,” regardless of what the covenants say. This undoubtedly would be a positive development for thousands of Hams living in deed-restricted housing. In addition, the Parity Act might be effectively applied to lease agreements for rental housing. With over 730,000 amateur radio operators in the U.S. and the majority of new home construction having some form of covenant restrictions attached, this is an issue that will not go away and that Federal law will have to clarify at some point in the future on the basis that, according to ARPA language:

- ◆ Amateur radio, at no cost to taxpayers, provides a fertile ground for technical self-training in modern telecommunications, electronics technology, and emergency communications techniques and protocols.
- ◆ There is a strong Federal interest in the effective performance of amateur stations established at the residences of licensees. Such stations have been shown to be frequently and increasingly precluded by unreasonable private land use restrictions, including restrictive covenants.
- ◆ Federal Communications Commission regulations have for three decades prohibited the application to stations in the amateur service of State and local regulations that preclude or fail to reasonably accommodate amateur service communications, or that do not constitute the minimum practicable regulation to accomplish a legitimate State or local purpose.
- ◆ Commission policy has been and is to require States and localities to permit erection of a station antenna structure at heights and dimensions sufficient to accommodate amateur service communications.

What can you do if you live under a residential covenant or lease until the Parity Act or other similar law is passed? Well, **Hugh Bahar WA2LXB** of Lansing, NY has “a few ideas to try to get around the restrictions” and offers a sizable list of web sites as follows:

<http://www.arrl.org/shop/Stealth-Antennas-2nd-Edition/>
<http://www.arrl.org/limited-space-and-indoor-antennas>
<http://stealthamateur.com/>
http://www.k4vrc.com/uploads/1/0/1/5/10156032/present-tvarc_antenna_guide.pdf
<https://forums.qrz.com/index.php?threads/10-ultra-stealth-antenna-designs-for-hoas.260566/>
<http://hflink.com/antenna/> (About 7/8 of the way down see the Broadband Butterfly Terminated Dipole)
<https://www.eham.net/articles/29557>
<http://www.g4ilo.com/stealth.html>
http://www.bvarc.org/pdf/HF_Antennas_by_KD5FX.pdf
http://www.rsqshop.org/acatalog/PDF/StealthAntennas_Sample.pdf
<http://www.iw5edi.com/technical-articles/hidden-and-stealth-antennas>
<https://kb3kai.com/dss-j-pole>
http://www.w4wta.com/Off_Center_End_Fed_Dipole.htm
<https://amrron.com/2015/01/23/stealth-radio-antennas/>
<http://www.n6cc.com/tactical-antenna-systems>
<http://www.af4k.com/ham/hidden.htm>

Wherever you reside, there is a wealth of helpful information on antenna solutions from the amateur radio community locally and on various internet forums. Though not everyone agrees on the need for legislation beyond PRB-1, most Hams believe that, we need to participate at the local, State and Federal level when necessary to preserve the rights of amateur radio enthusiasts for the sake of the hobby and its future. ★