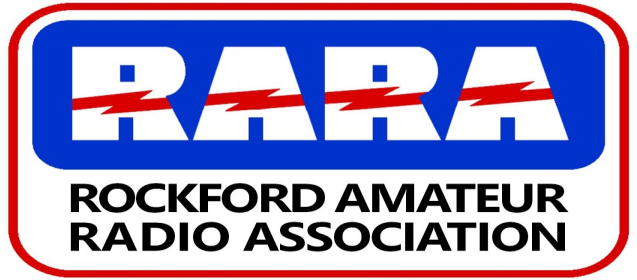


# HAMRAG

Visit our website for more club and area ham information at <http://w9axd.org>, or join us on Facebook at this [LINK](#)



## RARA Mission Statement

A member association with common interest of public service to the community through the use of amateur radio.

## October 2022

## Presidents Message

Hello Everyone,

October brings us another month of operating activities. The Illinois QSO Party, the School Club Roundup, and the SKCC Sprint. It seems there is plenty of action on the bands for everyone. Operating in any activity will help strengthen your skills, understanding of propagation, and operation of your station and antennas.

Speaking of your station, at our October meeting (on Google Meet) I will be talking about some of the controls on your radio, and how you can get the best from you equipment and what to do in different situations to operate effectively.

We are also accepting nominations at our October meeting for officers and Board members for 2023. We will be needing some members to fill some of the positions, so please think about helping us and offering you ideas and time. More information is inside the Hamrag. Our meeting link is: <https://meet.google.com/eoi-zvrf-boi>

I hope to see everyone online at our October meeting!

73,  
Kurt Eversole - KE9N



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- Nice 1/4 wave Vert.- page 13
- Membership Form - page 14

## Friends Remembered



### James J. Holich – AB9SX - SK

September 25, 1942 ~ September 24, 2022 (age 79)

James J. Holich passed away at his home in Belvidere, IL, of a massive heart attack at 8:30pm on Saturday, September 24, 2022. Jim was 79 years old. He was born on September 25, 1942 in Chicago, Illinois.

When Jim was six years old he started to have a daily paper route. During the 1960's he went to Loyola University in Chicago where he earned a degree in English Literature and graduated Magna Cum Laude. Jim was a tool and die marker in Chicago. He worked in maintenance for the Chicago School Board, Suter's of Sycamore, IL, Warner Lambert of Rockford, IL and General Electric (motor development), from where he retired in 2009. He traveled the world for several years as a Senior Manufacturing Engineer.

His hobbies were making steam engines in his metal shop at home, photography and a HAM radio operator, AB9SX. He gave much of his time to RARA as Hamrag editor, and well as providing license classes to those seeking a ham radio license and administering ham radio exams as a VEC. Jim also enjoyed collecting various ham radios which he restored and operated. He had quite a radio collection and offered advice to those who had questions on radios and their operation. Jim will be missed.....

Editor, KE9N

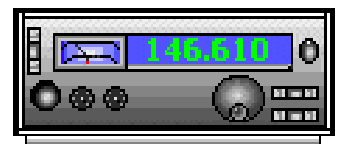
**NEXT MEETING**  
on  
**Google Meet**

**Friday**  
**October 14, 2022**  
**7:00 PM**

**The meeting link is:**  
<https://meet.google.com/eoi-zvrf-boi>

**“What are all those knobs on my radio for?”**

by  
**Kurt Eversole - KE9N**



Latest news and events on our web site: <http://www.w9axd.org>

## Local Events and Information

### UPCOMING RARA EVENTS

October 14, 2022 - General RARA Meeting 7:00 on Google Meet

October 26, 2022 - RARA Board Meeting 7:00 pm on Google Meet

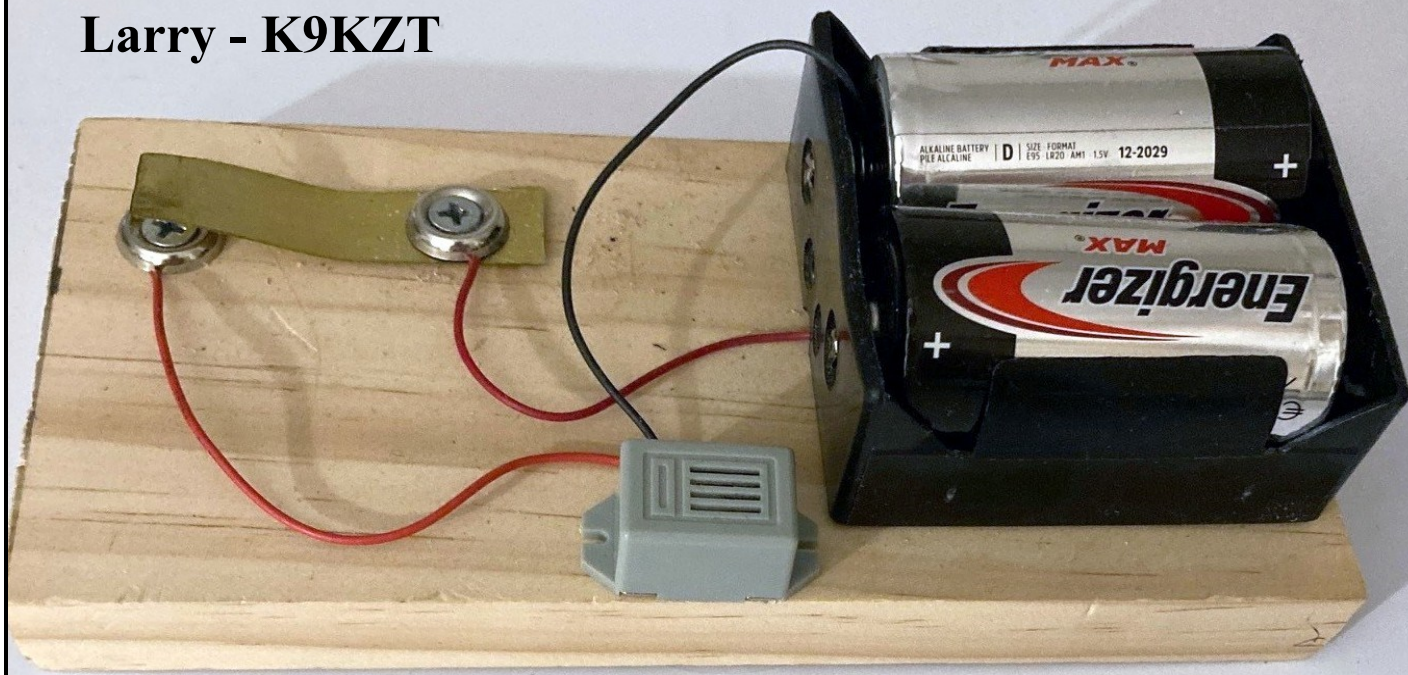
November 11, 2022 - General RARA Meeting

November 23, 2022 - RARA Board Meeting 7:00 pm on Google Meet

### SIMPLE PROJECTS

Here's a little gadget for Morse Code Practice. It consists of two flashlight batteries and holder, a buzzer, and a homemade telegraph key made of a piece of brass and two screws. You can get everything on Ebay!

Larry - K9KZT



#### Editors Note

If you would like to have something published , please call me or email me at [kurt.eversole@gmail.com](mailto:kurt.eversole@gmail.com).

Cut-off for the November 2022 issue will be Sunday, October 30, 2022

Kurt - KE9N, Editor

## 2023 Election Information

Nominations for 2023 Officers and Directors will be finalized at our club meeting on October 14th.

I ask that **all members** participate by emailing me at [kurt.eversole@gmail.com](mailto:kurt.eversole@gmail.com) before our meeting if you are interested in any one of these positions, have questions about responsibilities, or recommend another member for a position.

Below are general descriptions of the responsibilities for each position.

- **President** – presides at all meetings according to the Rockford Amateur Radio Association's constitution, by-laws and rules of order. Appoint all committees, sign official documents and carry out the recommendations of the Board of Directors. The President is also Chairman of the Board.
- **Vice President** – will preside over meetings if President is absent and coordinate meeting presentations.
- **Secretary** – will keep meeting minutes, roll of members, provide applications for membership, and oversee amendments, changes & additions to the constitution and by-laws.
- **Treasurer** – is custodian of monies received and expended, keeping records and issuing the Treasurer's Report to the Board of Directors monthly.
- **Directors (4+)** - The Board of Directors shall include these Officers, a minimum of four Directors, and current editor of the monthly bulletin (Hamrag).

The President appoints the Hamrag editor, webmaster, and repeater committee chairperson. Contact me if you are interested in any of these positions.

Final nominations will be published in November's Hamrag and elections will be held at the November 11th meeting.

Thank you,  
Kurt Eversole - KE9N



### 2022 RARA Officers and Board

#### **Officers:**

President - Kurt Eversole, KE9N, 815-389-2784, [kurt.eversole@gmail.com](mailto:kurt.eversole@gmail.com)

Vice President - Tom Shouler, N9VJU, 815-633-0089, [n9vju@comcast.net](mailto:n9vju@comcast.net)

Secretary - Jeff Metters, KD9MEC, 815-670-5506, [jeffmetters@gmail.com](mailto:jeffmetters@gmail.com)

Treasurer - Jimmy Curtis, KC9GOL, 779-537-2233, [jimhcurtis7818@yahoo.com](mailto:jimhcurtis7818@yahoo.com)

#### **Directors:**

Mark Broman, N9CNW, 815-218-5514, [markbroman@hotmail.com](mailto:markbroman@hotmail.com)

Larry Lisle, K9KZT, 815-397-9595, [l.lisle@usa.net](mailto:l.lisle@usa.net)

Ron Scott, 815-601-7754, [soccerrefl@charter.net](mailto:soccerrefl@charter.net)

Larry Schubert, AC9GO, 815-624-7772, [larry.schubert@gmail.com](mailto:larry.schubert@gmail.com)

Webmaster - Kerry Tatlow, KD9MAP, [kd9map@gmail.com](mailto:kd9map@gmail.com)

Repeater License Trustee - Gordon Seaman, KC9NEX, 815-262-0294, [ke9nex@gmail.com](mailto:ke9nex@gmail.com)

Hamrag Editor/Repeater Chairman - Kurt Eversole, KE9N, 815-389-2784



# Why Ham Radio Is Important

## Amateur Radio Makes the Connection to Save Lives in Wisconsin and Idaho

The following two rescue stories are great examples of why amateur radio is important. The first story occurred in Wisconsin and is told by ARRL member Scott Strecker, KG9IV. In his own words, Strecker shares how he was able to help a ham in distress. Thanks to the Chippewa Valley Amateur Radio Club in Wisconsin, an ARRL Affiliated Club, for this information.

"It was Friday, September 2, 2022, which meant I worked from my home office. I have the VHF radios on low to monitor them in the background. Recently, I got into the Allstar node with a hotspot. I use it to monitor the FM38 systems (Allstar 2495) in the southern [part] of Wisconsin.

At about 7:45 AM, I heard the Allstar node come up. An individual in distress was asking for assistance to get an ambulance to him. It was a ham in Brown Deer, Wisconsin. He had slipped on his bathroom floor and went down so hard he could not get up, but he happened to have his handheld with him (don't we all). He did not have access [to the] phone, and he lived alone.

[I called the] Brown Deer police call center. The dispatcher got the fire department rolling and then started asking me for more details. I had the dispatcher on speaker phone, and he could hear the hams' responses to the questions. Being on a handheld and [lying] prone, the signal was, at times, noisy. At that time, both the other ham and I used ITU phonetics to get the exact info out. All those times practicing on the ARES® nets made it second nature. The dispatcher was also able to understand the info without my having to repeat it.

It felt good to help out. I also realized it was due to my monitoring that I was able to hear his call. If you are not participating in the weekly local ARES net, I would encourage you to do so when you can."

In addition to Strecker's story, newly licensed amateur radio operators Shannon Vore, KK7GVG, and CJ Bouchard, KK7GNG, also shared a rescue story. On September 3, 2022, in the Rocky Mountains in northwest Idaho, they were out for a weekend of four-wheeling in their Jeep. The area is an extremely mountainous region with no towns, very few people, no facilities, and no cell phone coverage. The nearest airfield is Horse Haven Trail, an unimproved dirt strip that's severely eroded and covered with rocks and debris.

At about 4:30 PM, Vore and Bouchard were taking a break when an approaching truck notified them of an ATV accident involving two teenage girls. The accident scene was just a few miles away, and when they arrived it was clear the teenagers were critically injured. Bouchard was unable to contact several local repeaters, but was finally able to make contact using a simplex frequency (146.420 MHz) that's popular with the hams in Coeur d'Alene, 20 miles from the accident site.

While Bouchard and an off-duty Emergency Medical Technician (EMT) were administering medical aid to the teenagers, Vore took over radio operations. The call for emergency assistance was picked up by local amateur radio operator John Tappero, K7JNT, who immediately called 911 and asked that 146.420 MHz be used only for emergency traffic. For nearly 2 hours, Vore and Tappero provided relay between the 911 dispatcher, advising the condition of the injured and the approaching weather. Life Flight Network was unable to respond because of a severe thunderstorm immediately over the rescue site.

Two teams of EMT's were dispatched, but due to the mountains and the storm, they couldn't communicate with dispatch. Tappero continued to provide relay information for all parties until 6:00 PM, when the EMT's arrived. The teenagers were in stable condition and immediately transported to the nearest hospital. Today, they're in good condition and recovering.

*(continued)*

## Why Ham Radio Is Important

"It took us about 2 days to wind down from the experience," said Vore. "We are both glad we had our amateur radio licenses and were able to help."

Bouchard said that they had been using radios on the General Mobile Radio System (GMRS), but have since upgraded their licenses for more operating privileges. "Because the area signals were not good, it was difficult to communicate," he continued. "So, we studied, took our exams, and are now looking forward to much more amateur radio opportunities."

Both Vore and Bouchard are now looking to join a local amateur radio club and become involved in the ARRL Amateur Radio Emergency Services® (ARES®).

--Thanks to ARRL Idaho Section Manager Dan Marler, K7REX, and Idaho Assistant Section Manager Ed Stuckey, AI7H, for their help with the Idaho rescue story.

## Local Net Information

**Mon** - 7:00pm - RARA Info. Net & CW Lesson, 146.610 (-) offset, pl 114.8  
8:00pm - McHenry Cnty. RACES Net, 146.835 (-) offset, pl 91.5

**Tues** - 7:00pm - Health & Tech Net & CW Lesson , 146.610 (-) offset, pl 114.8  
7:00pm - Rock County Public Service Net, 145.450 (-) offset, pl 123.0

**Wed** - 7:00pm - Stephenson Cnty. ARES Net, 147.390(+)offset, pl 114.8  
7:30pm - Greater Beloit Radio Net, 147.120 (+) offset, pl 123.0

**Thurs** - 7:00pm - Health & Tech Net & CW Lesson, 146.610 (-) offset, pl 114.8  
8:00pm - Stephenson Cnty. SATURN Net, 147.390 (+) offset, pl 114.8

**Fri** - 8:00pm - Friday Night Fun Net, KC9GCR, 146.610 (-) offset, pl 114.8

**Sat** - 8:00pm - Saturday Ragchew Net, 146.610 (-) offset, pl 114.8  
9:00pm - Saturday Night Fun Net Milw., 146.910 (-) offset, pl127.3

**Mon. thru Friday** - 8:00am to 9:00am - Senile Net, 14.287 (HF USB)

### [The November Issue of Digital QST is Now Available!](#)

The November edition of *Digital QST* is now available for viewing on your desktop or laptop. Click [here](#) to open the issue. It is also available for reading on your Apple, Android, or Kindle Fire devices.

**You must be a member of the ARRL to view this.**



## The K7RA Solar Update

Sunspot numbers and solar flux increased this week (September 29 through October 5), as expected with the solar cycle progressing toward a probable peak in summer 2025.

Average daily sunspot number increased from 105.1 to 111.4, and average daily 10.7 cm solar flux from 138.4 to 149.2. Compare this to a year ago, when average daily sunspot number was just 59.4 and solar flux was 89.8.

This last week there were two new sunspot groups on September 30, one more on October 1, three on October 3, and one more on Thursday, October 6.

I have been noticing improved 10 meter propagation with openings lasting all day, now that the autumnal equinox passed two weeks ago and with higher sunspot numbers.

Predicted solar flux is 156 on October 7, 154 on October 8 and 9, then 152 and 150 on October 10 and 11, 148 on October 12 to 14, 130 on October 15, 135 on October 16 and 17, 140 on October 18, 145 on October 19 to 21, 150 on October 22 and 23, then 145, 140 and 135 on October 24 to 26, 145 on October 27 and 28, 150 on October 29, 155 on October 30 and 31, 145 on November 1, 135 on November 2 to 4, 130 on November 5 and 6, 135 on November 7, 140 on November 8 and 9, 130 on November 10 and 11 and 135 on November 12 and 13.

Predicted planetary A index is 14, 10, 12 and 8 on October 7 to 10, 5 on October 11 to 13, 8 on October 14, 10 on October 15 and 16, then 8 on October 17 to 19, 12 on October 20 and 21, 8 on October 22 to 29, then 20, 12 and 10 on October 30 through November 1, then 8 on November 2 to 10 and 10 on November 11 and 12.

On October 2, Spaceweather.com announced "A Big Dangerous Sunspot", AR3112, one of the biggest in years had just rotated over the sun's eastern horizon. They predict this could produce two weeks of high solar activity.

## UPCOMING HAMFESTS

### Friendly Fest

#### HAMFEST/CONVENTION

**Start Date:** 11/05/2022

**End Date:** 11/05/2022

**Location:** Elks lodge  
5555 W. Goodhope Rd.  
Milwaukee , WI 53201

**Website:** <http://MRC91.org>

**Sponsor:** Milwaukee Repeater Club

**Type:** ARRL Hamfest

**Talk-In:** 146.910 -offset 127.3 pl

**Public Contact:** Karen Burris , KC9WQJ  
414 E. Juneau Ave 102 Milwaukee, WI 53202

Phone: 414-578-0492

**Email:** [kc9wqj@gmail.com](mailto:kc9wqj@gmail.com)

# OPERATING EVENTS

## October School Club Roundup

There are two School Club Roundups during each school year in October and February. Each 5-day event runs Monday through Friday from 1300 UTC Monday through 2359 UTC Friday. A station may operate no more than 6 hours in a 24-hour period, and a maximum of 24 hours of the 107 hour event.

### October Event Details

#### Session: October 17-21, 2022

**1. Exchange** QSO info as below with any class of stations, especially with school stations. The full School Club Roundup exchange is to be sent and received over the air. Only digital modes that support the full exchange of required contact information will be allowed.

#### **2. Operating Period:**

**October** - third full school week of October beginning at 1300 Monday UTC and ending at 2359 UTC Friday.

A station may operate no more than 6 hours out of 24 and may not count more than a total of 24 hours of the 107 hour event. Clearly marked breaks of at least 10 minutes may be taken and are not counted towards total operating time.

#### **3. Entry Classes**

Single transmitter only:

- (I) Individual or Single Operator (non-club);
- (C) Club or multi-operator group (non-school);
- (S) School club or group (grades K-12, colleges and universities). (Any station operated at a school during the operating period. This includes any group formed for the purpose of participating in the SCR.)

If multiple transmitters are used, such as for demonstration purposes, care must be taken to include only the results from one at a time.

**4. Exchange:** Your call sign, Signal report, Class (“Individual”, “Club” or “School”), U.S. State, Canadian Province/Territory or DXCC country/entity. (Multi-operator group stations must choose one call sign to use for the whole operating period.)

For more information see this link: <https://www.arrl.org/school-club-roundup>

## OPERATING EVENTS



### The Straight Key Sprint

The two-hour Straight Key Sprint (SKS) occurs on the fourth Wednesday of each month starting at 0000 UTC. The goal of SKS is to work as many stations as possible during the sprint period using a mechanical key approved by the rules of the Straight Key Century Club. These include straight keys, sideswipers (cooties), and bugs. You can find the details of our key policy [here](#).

Please remember that although it is a contest, the SKS is rather informal. The main objective of the SKS is to bring together operators with different skill levels. Operating speed should be adjusted accordingly. Please send SKS comments/suggestions to [skc-manager at skccgroup dot com](mailto:skc-manager@skccgroup.com).

#### This month's sprint

Our 2-hour Straight Key Sprint will take place from 0000 UTC to 0200 UTC Wednesday October 26, 2022

Mark your calendar.....

Wednesday 0000 UTC - 0200 UTC (Tuesday evening for most of us)!

Jack KK0I will be our Bonus Station this month.

Please submit your results, see who the Top Guns are and read the great comments in the Soap Box.

Have Fun!

NOTE: SKS is an unassisted event. Please operate accordingly.

Upcoming Bonus Stations= Nov: Terry W7AMI, DEC Ugo IU4NYV

We are always looking for new Bonus Stations.

If you would like to try it (it's Fun!) we need volunteers. Contact [W4RQ@ARRL.NET](mailto:W4RQ@ARRL.NET)

#### **Call for Bonus Station Operators**

Operators interested in working the SKS as a bonus station at some point during the year, please drop me a note at the above comments/suggestions email address. There is no obligation involved in indicating your interest. I'll contact one or more operators a week or so before a sprint to firm up arrangements.

Thanks!

For more information see this link:

[https://www.skccgroup.com/operating\\_activities/weekday\\_sprint/](https://www.skccgroup.com/operating_activities/weekday_sprint/)



## OPERATING EVENTS

### Announcing the 2022 Illinois QSO Party

*Sponsored by the Western Illinois Amateur Radio Club*

**Date/Time:** 1700 UTC October 16 to 0100 UTC October 17, 2022

**Bands:** 160 through 2 meters, excluding WARC bands (60, 30, 17 and 12 meters)

**Exchange:** IL stations give RS/T and county; others give RS/T and state, province or country

**Scoring:** Phone QSO: 1 point; CW/digital QSO 2 points. No repeater QSOs. All stations are limited to one transmitted signal at a time. *(But see new "Unlimited" category below)*. SO2R operation is permitted. Stations may be worked once per band and mode (phone and CW/digital) and once per band/mode/county for IL Mobile and Rover stations. Each Mobile or Rover vehicle is considered one station and must use only one call. Contacts with/by stations at the border of 2/3/4 counties count as 2/3/4 counties and 2/3/4 QSOs. IL stations multiply points by the sum of IL counties, US states, VE provinces and DXCC countries (maximum 5) worked. Canada, KH6 and KL7 do not count as DX entities. Additional DX contacts count for points but not multipliers. Non-IL stations multiply points by the number of IL counties worked.

#### **Entry Classes:**

**IL Fixed Station, High Power.** Permanent station location, single county, transmitter power exceeding 100 watts PEP. *(Note change...was 200 watts PEP)*

**IL Fixed Station, Low Power.** Permanent station location, single county, transmitter power under 100 watts PEP. *(Note change....was 200 watts PEP)*

**Illinois Portable:** Not a permanent station location; antennas erected for the purpose of the contest; may be on a county line or corner. (NOTE: County lines established by waterways *may not be activated* for ILQP).

**Illinois Mobile:** Station capable of motion while operating though may be stationary. *Entrants are encouraged to utilize a separate driver and choose operating procedures with safety uppermost in mind!* Mobile entrants may operate from *only one county at a time*. Simultaneous operation from multiple counties will result in reclassification as a "Rover".

**Illinois Rover:** Station operating from more than one non-permanent location. Single-county, county line and county corner operations are permitted. Any type of mobile or portable antennas may be used. Any power source may be used (auto, generator or commercial mains). Rover stations may operate when moving or stopped.

**Outside Illinois, High Power:** Any fixed, portable or mobile station operating from outside the state of Illinois with transmitter power exceeding 100 watts PEP *(Note change: was 200 watts)*

*(continued)*

## OPERATING EVENTS

**Outside Illinois, Low Power:** Any fixed, portable or mobile station operating from outside the state of Illinois with a transmitter power not exceeding 100 watts PEP (*Note change: was 200 watts*).

**QRP competition:** A QRP entrant shall certify that the operation was with transmitter power at all times not exceeding 5 watts by indicating QRP in the entry class in the Cabrillo file or checking the QRP box on the summary sheet.

**Unlimited:** (*New category*) Stations wishing to employ multiple transmitted signals simultaneously at a single site may enter as "Unlimited". This class is created as an experiment to encourage groups to train new operators and allow several the opportunity to participate.

**Awards:** Plaques will be awarded to the highest-scoring IL Fixed Station High Power, IL Fixed Station Low Power, IL Mobile, IL Rover, IL Portable, 2-County Line Portable, Outside IL High Power and Outside IL Low Power stations. Plaques will also be awarded, regardless of entry class or station location, to the stations making the highest number of raw phone QSOs, raw cw QSOs and raw mixed-mode QSOs.

Certificates will be awarded to the 2<sup>nd</sup> through 5<sup>th</sup> place IL Fixed Stations High Power, the 2<sup>nd</sup> through 5<sup>th</sup> place IL Fixed Stations Low Power, 2<sup>nd</sup> through 5<sup>th</sup> place IL Mobiles, 2<sup>nd</sup> through 5<sup>th</sup> place IL Rovers, the top IL and Outside IL QRP entrants, the top 3 IL single-county portables, 2<sup>nd</sup> and 3<sup>rd</sup> place IL 2-county portables, top 3 IL 3-county portables, top 3 IL 4-county portables and the highest-scoring (reporting at least 25 contacts) stations in each US State, VE province and DXCC country. As certificates are delivered in electronic format via e-mail, all entrants are requested to provide a valid e-mail address in the Cabrillo file or on the summary sheet.

**Illinois Club Competition:** Illinois entrants are encouraged to include the name of their local club on their entries. **ILQP Outstanding Achievement Award:** Non-IL stations working at least 200 contacts or 75 IL counties will receive a special certificate.

**Logs:** All entrants who use computerized logging are required to submit logs in electronic format. *Do NOT submit a computer-printed log from a logging program without also providing the electronic file (Cabrillo file), as the scoring and verification process starts by transferring all log data into a master Excel file.* Hand-written paper logs accompanied by an official ILQP summary sheet will be accepted for transcription by the ILQP committee. Those who submit paper logs absolve the committee of all responsibility for miscopied log information. (See below)

**Electronic logs:** Cabrillo format is preferred. Those entrants using a program that does not provide Cabrillo files for submission should contact the committee concerning acceptable formatting. Use of the fill-in Excel file available on the ILQP site <https://w9awe.org/ilqp/> under Sample\_Excel\_Log is encouraged for non-Cabrillo logs.

Electronic logs should be sent as attachments [to n9jf@arrl.net](mailto:n9jf@arrl.net).

## Printed Circuit Board Information

### Printed Circuit Board Design

By Larry Schubert, AC9GO

My how things have changed over the years. When I first started out in ham radio, I think that I remember seeing circuit board layouts printed in the ARRL Handbook and I believe even some of the Ham radio magazines included some of the more popular layouts and a lot of the boards were actually for sale. I'm not sure when the practice stopped, but I have a 1991 Handbook that has some in the back. It was a process of transferring the layout by a process similar to making a photograph, and then etching the copper off of a copper clad board, and if you were lucky, you didn't take too much or too little copper off the board. The couple times I tried it I ended up not taking enough off one end or the other and frankly it was a mess. I may have had a good one once, but anyway the board never got built because I think I broke the only right sized drill bit I had, and said something that I won't repeat here.

That was part of the "bad old days" everyone tends to forget. OK, I'll admit it I was a failure. Later, Barber Colman decided to quit making boards, and I didn't feel so bad. I have even seen circuit board companies that failed to make some boards properly and left hairline shorts all over the boards. It is not an easy process. If you look at some of the boards of today you can find very fine traces, and in many cases multiple layers, and impossible to make at home. If you want to waste your time, just try to make a six layer board with hundreds of surface mount parts. You could design such a board and send it off to be made, and the software to do it might even be free. I'm not sure why you would want to do such a thing, but it can be done. This brings me to my topic today. Free cad programs for making circuit boards.

My thought was for making something small, and useful for Ham radio. Maybe a code practice oscillator, an SWR bridge, a single board single band qrp transceiver, maybe a small power supply, or maybe you have a project in mind. If you are interested, there are several good programs out there that will help you design a board, and send it off to be made and drilled for a small fee. Some of them have discounts for first time buyers, and you can even buy the parts for the number of boards that you want to purchase.

I couldn't believe the number of programs on the internet, many were free and great programs. Free is good so that is where my focus was put. I actually ended up downloading and installing four different programs, plus a program called LTspice that you can run on your PC to check your schematic. I'm not sure whether it is running on your PC or the internet, but it was a fun program to play with, because you could make different readings with the probes on the screen without running a smoke test. It is a good way to check if your voltage and current readings are what you expected for the components that you have chosen. You can also look at wave forms with an oscilloscope test.

Since I set out to look at printed circuit board programs, I didn't spend a lot of time with Ltspice, but it was fun to play with. I actually started with LibrePCB, which popped up when I downloaded another program. Since I use LibreOffice as a word processor, I thought I would check it out. It is a free and open-source suit of programs, and free is good. Since I have almost zero knowledge in making PCB's, I found the program lacking a little in teaching me what to do to make a PCB. I am sure that given some time this will become a great program, but it isn't there yet.

*(continued)*

## Printed Circuit Board Information

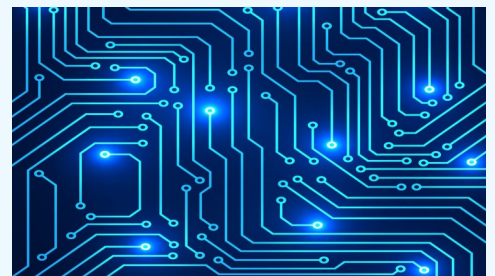
The second program I tried didn't have much help available to allow me to really do much of anything, so since I just quit trying, I'm not going to mention it here. Then I downloaded EasyEDA . They have a free program and it seems to be well supported. I was able to at least draw a simple circuit and find the symbols that I needed without going ballistic. The program is connected to a PCB supplier in China and a big Chinese electronics component supplier. The program is well documented with videos, and other help aids. The parts listed are backed by LCSC Parts and the PCB by JLC PCB, and by the way if you want to see an interesting video on how PCB's are made there is a full video on YouTube about JLC PCB's production facilities. If you want to get good circuit boards made inexpensively this would be a good bet. Among the questions I would have is what kind of problems would you run into getting these things through customs. This is an area where I have very little knowledge, so it could be little or no problem or a big problem.

The last program I looked at was DipTrace. It wasn't on any list that I found, but a video on YouTube caught my eye, and it was on how to design a PCB. I don't remember the title, but it so impressed me that I had to give it a try. Following the instructions that I found on the video, it was the only program that gave me no problems in the setup and getting it working, and I was able use Digi-key as my reference, for components, and when they didn't have something Mouser popped up. Both are companies that I bought from when I was buying parts at work. For ease of use this program took the prize for me. Basically, as I remember the process for most of these programs it goes like this:

1. For the beginner I recommend drawing out your schematic on paper first, then try it on a bread board with the components to see if it works.
2. Then open up the cad program the you have decided on, and put the circuit on the computer. Maybe even check it out with a circuit simulation program.
3. Use the program to help lay it out on a board complete with inputs and outputs that you can move around a 3d simulation of the board. This is the point where you set the size of the pads and traces, and make sure your grounds are hooked up, and all connections are made.
4. This step may be prior to number three because you have to have a Gerber file which is actually in the cap program for the board. The Gerber file as I understand it is a list of all parts used to make the board.
5. You also have to make a drill cad of the board to show which holes need to be drilled as well as size holes and where, and if they need to be plated or not.

Bottom line, there is a lot that has to be done to make a PCB. These are the basics. I would suggest watching several videos on YouTube before you attempt it. Good Luck!

73,  
Larry, AC9GO  
[larry.schubert@gmail.com](mailto:larry.schubert@gmail.com)





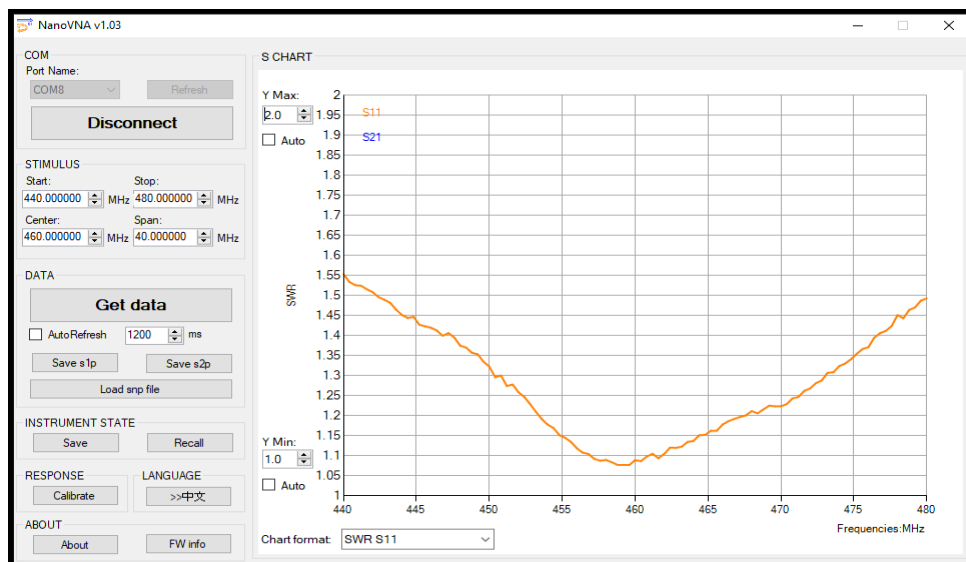
## Cheap Quarter-Wave Vertical for 450-470MHz, by Kerry, KD9MAP

There's a lot of commercial traffic in the 450-470MHz band. It's a mix of NFM phone and digital comms. I've been listening with just the same 2 meter indoor ground-plane vertical I use for talking to our local repeaters.

I decided to try for better performance, so I built an antenna specifically for UHF centered on 460MHz. This is a common design, an easy build that costs only around five dollars. You just need a SO-239 chassis-mount connector and five pieces of wire. I used 6-32 nuts and bolts to attach the radials, but it's cheaper to just solder them on probably. I used the fattest wire I had for the vertical element for better bandwidth; the solder pot on the SO-239 will accommodate 10AWG. The online calculator for wire lengths is here:

<https://m0ukd.com/calculators/quarter-wave-ground-plane-antenna-calculator/>

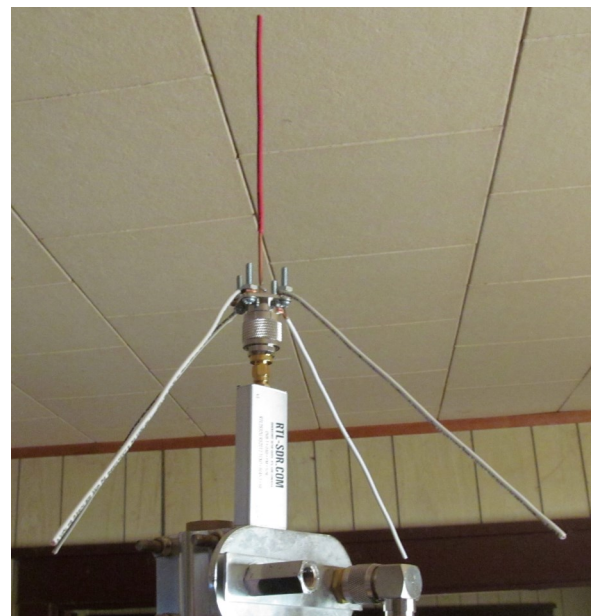
The calculated lengths never seem to hit the frequency exactly, so I cut the wires a little long, and use a NanoVNA to help trim them to the exact center frequency.



Since this antenna is so small, and I'm running it indoors, I mounted it directly to my RTL-SDR receiver dongle, to minimize transmission line losses. I connect the dongle to the PC with a long USB extension cable, which, because it's digital, introduces no analog signal losses like a long run of coax would.

The bandwidth is very good. Maybe it could be improved using a piece of one-inch diameter copper pipe for the vertical element. This antenna is an improvement over my former compromise antenna. In just the first few hours of use, I logged several new frequencies, and identified some that were previously too faint to copy.

73 DE KD9MAP



# RARA MEMBERSHIP FORM

If you would like to join the Rockford Amateur Radio Association, please fill out the form below and mail it (with the membership fee payment) to the address shown at the bottom of the form. If you have any questions contact our treasurer, Jimmy Curtis, KC9GOL, at 779-537-2233, [jimhcurtis7818@yahoo.com](mailto:jimhcurtis7818@yahoo.com)  
**Thank you for your support!**



website: [w9axd.org](http://w9axd.org)  
email: [w9axdrara@gmail.com](mailto:w9axdrara@gmail.com)

## 2023 RARA Membership\* Form Dues are \$25.00

Date: \_\_\_\_\_ (mm/dd/yyyy)

Name: \_\_\_\_\_ Callsign: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

Phone - Home: \_\_\_\_\_ Cell: \_\_\_\_\_

Can we release your e-mail and phone number to members only? Yes \_\_\_\_\_ NO \_\_\_\_\_

Are you a member of the ARRL (American Radio Relay League)? Yes \_\_\_\_\_ NO \_\_\_\_\_

What things do you like to do with ham radio?

\_\_\_\_\_

What things do you want to do, but need more information to do so?

\_\_\_\_\_

Would you be available to make a presentation on some part of our hobby and what?

\_\_\_\_\_

Do you have any questions that we can help you with presently? If so, explain below.

\_\_\_\_\_

\_\_\_\_\_

Please fill out all the information on the form and mail it with \$25.00 to the following address:

Rockford Amateur Radio Association  
P.O. Box 8465  
Rockford, IL 61126

Make your check payable to: Rockford Amateur Radio Association.

\*Membership is based on approval of the RARA Board. The membership fee will be returned if you are not approved.