

# THE KEY

Official Journal of The Riverland Amateur Radio Club



The Riverland Amateur Radio Club is a Special Service Club affiliated with the American Radio Relay League. The club is active in community service as well as actively promoting Amateur Radio in the Coulee Region. The Club is open to all who are interested in Amateur Radio and will help unlicensed persons become licenses thru the FCC.

## Crystal Radio

**Riverland  
Amateur Radio  
Club**  
P.O. Box 621  
Onalaska, WI.  
54636

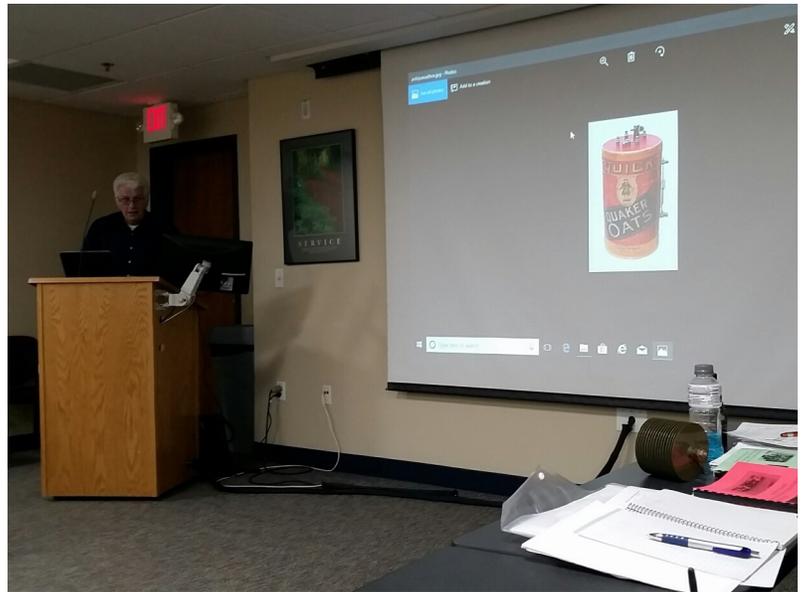
**Repeater**  
146.970 PL 131.8

**RARC Net**  
8:00 PM Sunday  
night on the  
146.970 Repeater

**Club Meetings**  
Trustee Meeting  
3rd Monday of the  
month at King  
Street Kitchen at  
5:00 PM, all club  
members are  
welcome.

**Program evening is**  
1st Tuesday of the  
month at 7:00 PM,  
Gunderson Clinic  
conference room 1  
in the lower level.

The February Program Night was very interesting as Bill Wood, KE9XQ gave a talk on Crystal Radio and how to build them with simple items found around the house. Definitely stirred up some interest among the group. Thank You Bill for this presentation.



Read more about the Crystal Radio Presentation by Carl Thurston on page 5 of this newsletter.



Finally the shortest month of the year is over. Why do I say that? Because I consider February as the "Dog Days Of Winter". Come February I am getting tired of cold and snow and there doesn't seem to be a lot of activity in Ham Radio or any other interest that I have. So the shortest month of the year becomes the longest month of the year as it just seems to drag on and on. But now we get on to March. The weather starts getting better so out door activities start happening. Activity planning will get into full swing such as the St. Patrick's Day Parade, MS Walk, Field Day and the Swap Fest, as well as other activities as they pop up that the club will pursue. For me personally planning for retirement continues as this is the year. Now the next 4 months will seem to drag on and on.

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**Riverland Amateur Radio Club  
PO Box 621  
Onalaska, WI 54650**

President.....Kevin Holcomb, KC9ZGD  
Vice-President.....Dan Abts, AB9TS  
Secretary.....Rick Kolter, KD9GVS  
Treasurer.....Greg Miller, K9LEC  
Trustee.....Carl Thurston, KC9HDS  
Trustee.....Roger Reader, KA9BKK  
Trustee.....Bill Wood, KE9XQ  
Newsletter Editor.....Greg Miller, K9LEC

The Key is published monthly and e-mailed to members and friends of the Riverland Amateur Radio Club. Address any correspondence to: Greg Miller at k9lec@arrl.net.

Visit our website at rarc.qth.com



Testing for new Ham's or upgrades for 2017 will be on the following dates:

- April 28
- June 1
- August 4 (RARC Swapfest)
- November 10

Register 5 days in advance with Roger Reader, KA9BKK, 608-783-0723 or readers@centurtytel.net.

**"A Climb I Will Always Remember"...Greg Miller K9LEC**



Have you ever climbed or attempted to climb a mountain? I tried, and maybe it was to late in my life to attempt to climb Mt. Rainier. But it was fun and challenging and I will try and share with you what it was like and show some beautiful pictures from the climb at the March Program Night March 6 at the Gunderson Clinic Conference room in the lower level at 7:00 PM.



Due to an ice storm in February the Executive Meeting was cancelled so there will not be any meeting minutes in this month's "KEY".

March 4...Sunday Night net on the 146.97 repeater at 8:00 PM. Net control is Dave, kd9epn

March 6, 2018...Program Night (Greg Miller on his adventure climbing Mt. Rainier)

March 11...Wisconsin QSO Party, 1:00 PM to 8:00 PM. (See [ww.warac.org/wqp/wiqp\\_rules.htm](http://ww.warac.org/wqp/wiqp_rules.htm))

March 11...Sunday Night net on the 146.97 repeater at 8:00 PM. Net control is Mark, kb9ofk

March 18...Sunday Night net on the 146.97 repeater at 8:00 PM. Net control is Carl, kc9hds

March 19, 2018...Trustee Meeting at King Street Kitchen

March 25...Sunday Night net on the 146.97 repeater at 8:00 PM. Net control is Greg, k9lec

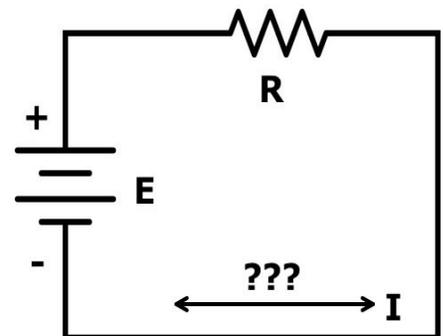
April 3...Program Night (Carl Thurston will give us an overview of a train wreck that he was involved in)

## Which way does current really flow?

By Dan Romanchik, KB6NU

I was recently taken to task by one of my blog readers regarding my description of current flow in my *No Nonsense Technician Class License Study Guide*. He wrote:

You casually say that current flows from Positive to Negative (with cool accompanying directional arrows), without any accompanying qualifying statement. Over the years I have looked at ALL the views on the subject. Positive to Negative is NOT what I was taught 48 years ago, and I have never seen a good reason to change my view.



In a subsequent email, he pointed me to a Nuts 'n Volts article, ["Which Way Does Current Really Flow?"](#) and asked my opinion. In the article, the author, who is a ham by the way, does a good job of explaining the various types of current flow.

I agree that in electronic circuits electrons flow from negative to positive, but it really doesn't matter. I agree with one of the article's commenters who says,

This is a silly argument. It's like comparing apples and oranges and challenging people to take sides.

Electron flow is not current flow. Electron flow is easy to understand, an actual physical property, and a real help in understanding vacuum tube operation. But it falls apart when one needs to understand complex electronic systems.

[Conventional] current flow is a mathematical abstraction. It is defined as a net flow of positive charge, irrespective of the polarity of the physical charge carriers — whether electrons, holes, positive or negative ions, or whatever.

When looking at any circuit containing a resistance with a voltage across it, conventional current through that resistor says that the voltage drop occurs as the current through it meets resistance. On the other hand, in negative (electron) flow, a voltage INCREASE will correspond to the 'current' flow through it, clearly violating physical laws. Conventional current flow is consistent with the laws of physics and those of other engineering disciplines.

You are correct that engineers, professors and scientists use conventional current flow. That is not because they are too obtuse to understand electron flow; I assure you they fully understand it. It is because in their world they have to solve more general problems involving complex math and science, and, again, conventional current flow is consistent with physical laws.

It is unfortunate that electron flow and current flow are so often confused. They both have their place.

After reading that article, I thought I'd see what the ARRL Handbook has to say about current. In the 1963 edition, they don't mention electron flow at all. They have one diagram showing the direction of current flow in both series and parallel circuits, but the voltage source has no polarity. It's simply labelled "Source of E.M.F." Diagrams giving practical examples of series and parallel circuits do include a battery, and if the reader were to mash up the two diagrams, they would conclude that current flows from the positive terminal to the negative terminal.

The most recent edition of the Handbook that I have is the 2005 edition (it might be time to get another copy!). It says,

Electrons move from the negative to the positive side of the voltage, or EMF, source. Conventional current has the opposite direction, from positive to negative. This comes from an arbitrary decision made by Benjamin Franklin in the 18th century. The conventional current direction is important in establishing the proper polarity sign for many electronics calculations. Conventional current is used in much of the technical literature. The arrows in schematic symbols point in the direction of conventional current, for example.

Having said all that, I really don't see that there's much of a controversy here. I did learn to think of current as conventional current in college, although it was mentioned that electrons actually flow in the opposite direction. Using the concept of conventional current has never seemed to hold me back. I've been able to design circuits and repair electronic equipment thinking that current flows from positive to negative.

Although it's a departure from my "no nonsense" style, I am thinking of including a sidebar, similar to the par above from the 2005 Handbook explaining the two ways of looking at current flow. What do you think?

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When he's not trying to figure out which way current flows, Dan blogs about amateur radio at KB6NU.Com, teaches ham radio classes, and operates CW on the HF bands. Look for him on 30m, 40m, and 80m. You can email him at [cwgeek@kb6nu.com](mailto:cwgeek@kb6nu.com).

# Simple Radios made XTL Clear...by Carl Thurston, KC9HDS

To get to the essence of radio, one must pare it down to the very simplest of components used in the most elemental way. This is what makes a crystal radio the basic device that it is. It is easy to ignore the crystal radio, it is so simple and has such a limited use, but it also uses the least amount of power. When using a crystal radio, you are going as QRP as possible.

At our February RARC meeting, Bill KE9XQ did a presentation of the lowly crystal radio. As hard as it might seem, he was able to take this simple device and exhibit many of its variations and complexities. One might have thought that this topic wouldn't take more than ten minutes to cover it adequately, but Bill went into so many different types of crystal radios that most people have probably never seen or heard of before, that well exceeded the ten minute time limit..

Every type of crystal radio was shown and explained in a most interesting and precise way. Some of those he talked about included one model that was popular with soldiers in the trenches of World War I, it was made with the crudest of materials, including a pencil stub, a bit of wire and a single edge blued razor blade, plus a good dose of ingenuity. He also told of crystal radios that used a Galena crystal and a cat's whisker. Some with unique coils made in the form of a basket weave or a spider web, some with simple capacitors, some with variable air gap capacitors, and some with many variations on those themes.

When designing and building a crystal radio, there are endless ways to go. You can be very simple and organic with it or slowly build it up to be more efficient and thus more complex. One needs to be aware that the more complex and efficient you build your crystal radio, you will also be incorporating more and more expensive components in it.

The pursuit of the most elemental and elegant crystal radio can be a real challenge. Its simple nature can be very deceiving. In fact, to make a truly good crystal radio, a number of carefully selected components must be considered. It is a bit like building a form out of tinker toy pieces. The possibilities are endless and the results can be remarkable. All that you need are the basic parts and the time needed to assemble them. Once assembled, you can always take it apart and add more parts to it to make it work better and pull in more stations, or you can satisfy yourself with the most minimalistic design possible to achieve your goals.

As Bill likes to say, "Just go with it and play with it!" It is pretty obvious that Bill likes to take things apart and put them back together again in different ways. Being an idea person, Bill often is heard saying things like "What if I do this?" or "What will happen if I put this component in parallel with that one?"

Many of the people present as Bill was unfolding the mysteries of crystal radio use and construction, were amazed and perhaps inspired to build their own crystal radio sets. Whether they achieve a workable radio as a result is immaterial, the important thing is that they will gain a further knowledge of the principals of radio and perhaps will be able to bridge the gap from theory to reality while working with these devices. The mystery of crystal radio was made XTL clear by Bill that night. Thanks Bill for reintroducing us in the wonders of the simple crystal radio. What's easy can be some times very hard, but Bill made it seem simple.