From the Editor

Mel Minnick stepped down from his roles as Repeater Rag editor and DRL Secretary in May. On behalf of DRL, our thanks go out to Mel for his many years of service to the Denver Radio League and for publishing the Repeater Rag. He made the Rag something to look forward to issue after issue. Mel’s insatiable desire to keep up what’s happening in the hobby allowed him to fill our newsletter it with events and articles about amateur radio most of us were not aware of. He leaves behind some big shoes to fill.

I’ll strive to maintain the standard set by Mel by serving up a variety of information spanning the wide-ranging amateur radio hobby. It’s an enormous field with dozens of specific interest areas. No one person, except perhaps for Mel, could keep abreast of all that’s going on. So I’m calling on DRL members to lend their expertise and perspective to help keep us all current with your particular areas of interest.

If there’s a subject that’s near and dear to your heart, please let us all know more about it. Better yet, send me a short description of it and I will include it in an upcoming issue of the Repeater Rag.

By contributing your ideas and thoughts to the Repeater Rag you’ll be sharing your passion with other DRL members and they’ll get to know more about you and your interest. Sharing is what makes us a more congenial club. It also turns you into potential resource for members who may want to pursue similar interests.

Jim KEØNRE
Editor

Submit articles for publication to the Editor, KEØNRE @ARRL.NET.

DRL Officers

The Board Members:
President – Dan Meyer, NØPUF
Vice President – Jim McNamee, KEØNRE
Secretary – vacant
Treasurer – David Mayzes, KC7MP
At-Large Board Members –
   Mark Boddy, KD5DKQ
   Tom Dall, KD4DT
Repeater Trustee – Dan Meyer, NØPUF
Club Call Sign – KEØNCQ

A Friendly International Reminder

The International Amateur Radio Union – Region 2 issued Resolution 17-1 on May 30, 2019. They cautioned about using the WARC bands for contesting purposes. There bands include:

135.7 – 137.8 kHz, 472 – 479 kHz, 5.3515 – 5.3665 kHz, 10.1 – 10.15 MHz, 18.068 – 18.168 MHz and 24.890 – 24.990 MHz.

WARC bands are much smaller than traditional amateur radio bands and are made available for our use on a secondary basis. IARU offered no explanation for issuing their statement at this time.
Amateur radio was very different a century ago in some ways from what we know today and yet some aspects of it seem quite familiar. Inspection of a 1920 issue of the ARRL’s QST publication recounts what it was like being a ham operator in 1920.

With only a few thousand operators, amateur call signs could be short and simple. They were what we’d call today 0-by-2s: 1AW, 8ER and 9AB are examples. As the ranks of American hams swelled to hundreds of thousands the now familiar 1-by-2 and 2-by-3 call signs became necessary.

The spark gap transmitter was an amateur’s most cost-effective solution but its spectrum was so broad that one 500-watt unit would overwhelm other stations for a dozen miles around. A few clever operators were beginning to use tuned LC circuits to limit their signal to a narrower slice of spectrum. Hams would begin experimenting with amplitude modulation but CW remained the primary means for QSOs.

Propagation was often troublesome. 1920 fell at a solar minimum between peaks of Cycles 15 & 16. Scientists of the time knew an ionized region affected the Earth’s magnetic field but they had no understanding of how the ionosphere influenced RF signals. Modern hams still contend with poor propagation particularly now that we’re near the minimum between Solar Cycles 24 & 25.

We’ve come a long way in a century. Receivers are far more sensitive and selective. Transmission spectrum can be restricted to several dozen Hz. Our available operating spectrum has expanded ten thousand-fold. And in addition to CW we have a score of modulation schemes to choose from.

Handling message traffic remains a vital radio use case. In addition, today’s amateur radio operators continue to pioneer ways to combine their knowledge, experience and technologies to address problems new and old.

Curiosity and ingenuity will make ham radio a vibrant hobby that evolves for decades to come.

Linux and Amateur Radio
Go Hand in Hand
Mark Boddy, KD5DKQ

Let me start by saying I am passionate about Linux so bear with me if I get too giddy. Back to the topic at hand the “Why?” response to my title.

Amateur Radio started with people salvaging what they could and cobbling it together to create a transmitter so they could talk to other like-minded individuals. Years later Heathkit came along and put everything together in one package. All you had to do was apply some heat, solder, and time before you joined the elite group of radio operators. Arguably, Heathkit was one of the biggest boons and catalysts for increasing the number of radio operators around the world.

I would be remiss not to point out how building from scratch and kit building made you a better operator. You understood the components you added. You learned how to “tweak” them to make the audio a little better or your signal a little stronger. Today we go online or better yet drive to HRO plop down a wad of cash and walk out with a radio with little knowledge on what’s really going on inside that magic box.

So, what does Linux have to do with this? Linux Torvalds created Linux out of necessity. He needed a software application to interact with his University that the school did not (could not?) offer so he did it himself. But unlike others, he shared it with the world figuring he wasn’t the only one with the same problem.

Fast forward and in response to his users’ requests he kept adding features and voila, we have an incredibly flexible operating system. For Free. By “giving” his software away for free he indirectly created the Open Source movement which has millions of programs shared with the masses under a few different licenses. For a mind-boggling list, point your web browser to https://sourceforge.org and search for anything you can imagine! For starters, try searching on “Ham Radio” and “Amateur Radio” and then throw some scientific terms in there. If that’s not enough, try searching on “To-do List”
or “Grocery List” or “Personal Money Manager” and well, you get the idea.

Unlike the proprietary operating systems, Linux allows you to “pop the hood” and tweak things to make your program do things better. Sometimes this can be a detriment, speaking from experience! In the end, this tinkering and the subsequent successes and failures lead to a tremendous learning experience that is satisfying!

Given these two DIY approaches, what could be better than taking an open source operating system and combining it with what I consider the original open source project – amateur radio?

I plan to submit articles on projects incorporating Linux and Amateur Radio to future Repeater Rag issues. If this sounds good please let Jim know at ke0nre@arrl.org. If you have ideas or specific topics you’d like to explore in this section please let me know kd5dkq@arrl.org.

DXing Advice
Mel Minnick, KØMEL

The "grey line" is a band around the Earth that separates daylight from darkness. Propagation along the grey line is very efficient. One major reason for this is that the D layer, which absorbs HF signals, disappears rapidly on the sunset side of the grey line, and it has not yet built upon the sunrise side. Ham radio operators and shortwave listeners can optimize long distance communications to various areas of the world by monitoring this band as it moves around the globe.

Space Weather

The state of Earth’s ionosphere fluctuates from day to day and week to week much like our terrestrial weather does. On the scale of an 11-year Solar Cycle we are nearly at another minimum of sunspot activity with the next peak some 5-6 years hence. An absence of sunspots means fewer opportunities for charges to make refractive ionospheric layers and therefore less opportunity for electromagnetic waves to skip great distances around the world.

Several internet sites provide daily, detailed information about events on the Sun’s surface. Here are some links:

http://www.solarham.net/
http://www.hamqs.com/solar3.html
http://www.spaceweatherwoman.com/
https://dx.qsl.net/propagation/

When it comes to HF propagation, solar indices can be useful predictors. Two indices that particularly helpful to radio operators are the K and SFI. K is a measure of what the Earth’s magnetic field has been doing over the last three hours. When 1<K<3 propagation can be good in the evening. But when K rises to 4 or greater, evening propagation tends to be poor. SFI, short for solar flux index, predicts good daytime propagation conditions when its value is greater than 100. Propagation during the day is not so good when SFI is less than 70.

Recently, researchers have noted a striking correlation between the 11-year solar cycle and a simultaneous alignment of Venus, Earth and Jupiter ever 11.07 years. The authors theorize that gravitational pull from these planets causes tidal behavior on the Sun to change much like our Moon influences ocean tides. How these relatively small perturbations in the Sun’s plasma surface might promote sunspots and coronal mass ejections is uncertain.


Starlink

Speaking of space, SpaceX launched 60 satellites in May, the first of what will become a 12,000-satellite low Earth orbiting communications web. The SpaceX web will be capable of delivering high speed internet access all over the world. At an orbital altitude from 200 to 300 mi, Earth-to-satellite latencies could be as short as 25 to 35 ms. There are plans to make these satellites available for
conventional amateur radio use. Having high speed internet access nearly everywhere could be an advantage for ham activities such as Field Days and DXpeditions.

Summer Field Day

ARRL’s Summer Field Day event starts on the last full weekend in June. This year the dates are Friday June 22 through Saturday, June 23. Estimates are that 10% of American hams will take their rigs outdoors on the weekend and try to make as many contacts as they can. One goal of Field Day is to demonstrate that amateur operators can get on the air without the benefit of commercial power sources using improvised antenna systems and practice doing so. By operating outdoors, in public places, on the same day Field Day operators showcase the hobby and its capabilities in case of emergency.

Nearly 50% of American amateur radio operators hold a Technician class license. They routinely use battery powered HTs and mobile rigs on VHF/UHF simplex channels to make contacts. Notably, a few of those mobile hams regularly make contacts on the HF bands every day of the year. Although they don’t call attention to themselves, they are a valuable resource for emergency communications operations.

Goodbye OOs. Hello VMs.

For more than 85 years the ARRL has sponsored the Official Observer (OO) program. It was designed and operated to help Amateur Radio operators help one another to operate their stations in compliance with FCC regulations. They serve as the eyes and ears of the FCC. The objective of the program was to notify amateurs of their operating irregularities before they come to the attention of the FCC. They watched for frequency instability, harmonics, hum, key clicks, broad signals, distorted audio, over deviation, out-of-band operation and other potential problems.

Effectiveness of the OO program has waned over the decades so the ARRL is working with the FCC to replace it with something called a Volunteer Monitoring (VM) program. VM’s goals will remain largely the same but the supporting administrative structure will change. It is expected that the number of VMs will be substantially fewer than the current OOs.

Riley Hollingsworth, K4ZDH, will oversee the ARRL’s role in coordinating the VM program. ARRL official anticipate the first wave of VMs will be in place by the end of the year.

A Century of WWV

Who hasn’t tuned to WWV to set a clock or check their receiver’s accuracy? WWV broadcasts extremely accurate and stable carriers on six transmitters, one each dedicated to 2.5-, 5-, 10-, 15-, 20- and 25-MHz. The 5-, 10-, 15-MHz signals are transmitter at 10 kW while the others broadcast at 2.5 kW. Time “ticks” delivered every second are accurate to within 100 ns.

WWV was established in 1919 by the Bureau of Standards in Washington, D.C. as a national service. It is the oldest continuously operated radio station in the world and it turns 100 years old this fall.

The National Institute of Standards and Technology (NIST) and the Northern Colorado Amateur Radio Club (NCARC) are organizing events to celebrate this momentous occasion. A special event call sign, WW0WWV, has been granted to the WWV Amateur Radio Club for this occasion. Event is planned for September 28 - October 2.

NCARC will operate equipment outside WWV’s security perimeter. NIST will focus on an open house at the WWV radio station which is situation north of Fort Collins.
Ham Equipment for Sale

Jack, WAØBDF, is parting with his tower and antenna system. He’s got a 34-foot fold-over tower and a Model TB-3B Hornet Triband antenna. There’s an assortment of guy wires, coax and more also available. Jack is willing to sell them for a negotiable price. Reach out to him at (303) 794-5718.

Recycling Electronic Equipment

What ham doesn’t have a junk box, junk drawer, junk shelf, junk closet or even an entire junk storeroom full of old equipment that no longer works. Hams hold on to broken electronics because it’s full of working parts and one day we’ll find a good use for one of them.

Eventually storage space runs out. What’s the best way to dispose of old electronics? Don’t toss it in the trash. Some recycling firms will take it for a fee. Some cities let you recycle these items a couple times a year for a fee. But if you’re in a hurry there are places that will take it off your hands for free. Goodwill Industries accept any computer, working or not. Englewood Electronics Recycling Drop Off Center, FCI Englewood located at 9595 West Quincy Avenue, Littleton recycles radios, printers and electronics for free in most cases. (https://www.unicor.gov/RecyclingEnglewood.aspx). Now that you’ve properly disposed of it, you can start collecting newer electronic junk.

Morse Steganography

See a difference in the following string of single quote marks?

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They look quite similar. They are the same left single-quote mark but they come from two different type faces, Arial and Times New Roman. When you interpret the Arial characters as dashes and the others as dots, they spell the word MORSE in Morse code.

Steganography is the method of concealing a message inside another message, image or document. It’s been used for a very long time in the art of spy craft.

This year Morse code and steganography joined forces to catch unauthorized copying of song lyrics from an internet site according to an article in The Wall Street Journal. Music site Genius.com believed contents from its lyrics site were being copied and used by others on their web sites. To prove their suspicious, Genius changed the type face of single quotation marks present in certain song lyrics on their site so it would spell out the message “REDFANTED” in Morse code. Genius then look at lyrics on other web sites and analyzed any quotation marks it found. Genius’s plan was ingenious. The found a copyright infringer. This isn’t an application Samuel F. B. Morse had in mind when he devised a way to send messages via telegraph. It is a reminder that Morse’s code remains as relevant today as it was in the 1840s.
The Denver Radio League meets quarterly at Bemis Public Library, 6014 S Datura St, Littleton, CO on the third Wednesday of January, April, July and October. Members and guests are welcome to attend. Our main meeting starts promptly at 7 PM and ends at 8:30 PM. Board meetings commence one hour earlier at the same location.

DRL Meetings

Renew Membership or Join DRL

Membership in the Denver Radio League is open to all licensed amateur radio operators.

Annual Dues:

Please make your check in the amount of $15 payable to Denver Radio League.

Include your:
- Name
- Call sign
- License class (Tech, General or Extra)
- Mailing address
- Phone numbers (work, home, cell)
- Email address

Send your dues payment to our treasurer:

David Mayzes, KC7MP
8555 S Field St.
Littleton, Colorado 80128

Your dues purchase one year of DRL membership.

DRL Repeaters

The Denver Radio League operates four repeaters that provide coverage across most of the Denver metro area. Repeater usage is limited to properly licensed hams.

VHF

145.050 MHz, packet only
146.640 MHz, -600 kHz offset, 100 Hz CTCSS
146.880 MHz, -600 kHz offset, 100 Hz CTCSS

UHF

445.600, -5 MHz, currently offline

For additional information concerning location and coverage maps for each repeater location, refer to the DRL website:

http://denverradioleague.org/repeaters

If you note a problem on a repeater, contact a Board member immediately to report it.