



# THE ROUND TABLE

Monthly Newsletter Of The Denver Radio Club

Since 1917

March 2021

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## PRESIDENT'S MESSAGE

BY GERRY VILLHAUER, W0GV

Hello DRC Members,

I hope you all are doing well and staying safe. I got my second COVID vaccination two weeks ago and Cathy got her first. Neither of us had any reaction from the shot. We had to drive to Brighton for her vaccination but, it was an easy drive.

If you are a subscriber to QST magazine, and I hope you are, please take note of the article on page 69 of the [March 2021 issue](#). The FCC will require a current mailing address AND email address to be on file along with your personal FRN number. The article says "Revocation of the station license or suspension of the operators license may result when correspondence from the FCC is returned as undeliverable because the grantee failed to provide the correct email address." Like it or not; that is the FCC's position. I went in and updated my information, it was not difficult but the site is not very intuitive, in my opinion.

We have suffered a failure of our 220 mhz. repeater and it is currently off the air. We have had intermittent issues with it for several months; now it has developed into a complete failure. We are of currently looking into what repair is needed.

Thanks to Bill Thomas (WT0DX) for a very interesting presentation at our February meeting on the digital modes and the advances in technology since his previous presentation two years ago. Bill ended his presentation with a live on the air demonstration. Great Job Bill!

March Presentation Announcement:

Ham radio operators, shortwave listeners, broadcast DXers, and other enthusiasts are usually quite aware of the growing RF radio noise issues. An increasing number of listeners report deteriorating reception, but they usually don't know why.

Steve Johnston, WD8DAS, will discuss RF radio noise. He was a Broadcast Engineer for 30 years and now consults in Madison, Wisconsin. When he was with radio station WPR, he found that over 5 years the Audience Services logs showed a 40% increase in complaints related to reception issues.

Steve will discuss the following: why search for radio noise, FM field noise tests and results, techniques for locating noise sources and many examples of noise sources.

Mark your calendar for Wednesday March 17th and join us for an informative presentation.

Thanks to all of our new members who have recently joined the DRC. Your support is very much appreciated. Please come to meetings and events and stay active. Your name and call will be posted in this edition of the Round Table.

73 for now,

Gerry  
W0GV  
President



## WHO'S NEW IN THE DRC?

BY BOB WILLSON, KC0CZ

The DRC is a very active club in the Denver metro area and we'd like to have all of our members listen for these new calls and personally to make them feel welcome. Welcome to our newest members:

Michael Chang - W0DDS	Rob Matthew - KB3VCU	Michael Gabbard - K1MBG
Stuart Davis - KD0IOZ	-	David St. Andre - KC0EFN

We have a number of activities throughout the year and we'd like very much for you to participate in serving your community. If you have questions please feel free to ask on any of the repeaters or see the contact information on the last page of this publication.

Also, please join us once a month at the regular club meeting on the 3rd Wednesday at 7:00 p.m. For new hams we have the Elmer session which starts at 6:00 p.m. before the regular meeting.

## TECHNICAL COMMITTEE REPORT

BY BILL RINKER, W6OAV

There were no meetings scheduled for January and February. All projects are on hold due to the virus and the winter weather. However, the tech committee members are discussing possible projects for the upcoming year.

The following is an overview of current issues for the Tech Committee.

### DRC/TSA Aurora Site.

Goal: Work with the TSA relative to establishing a "communications room" for the DRC.

Status: This project shelved until Covid-19 is over.

### Replace 220 Repeater Antennas

Goal: Improve coverage for the repeater.

Status: WW0LF is constructing the coax harness. Once completed, a work party will be scheduled.

### Install a Remote 6 Meter Receiver

Goal: Investigate the possibility a remote receiver to resolve the high noise level at Station 4.

Status: WG0N and W0GV will check out conditions at a possible site.

## LEARNING NET REPORT

BY FRED HART, AA0JK

### Purpose:

We are here to help introduce, and promote, a variety of topics of interest to all amateur radio operators.

Our intent is to help participants get more active, involved, and engaged in amateur radio.

Topics of interest we encourage:

Personal Communications

-Getting started in the various modes, of communications.

Emergency communications



- Participation in public service.
- Training in emergency communication for volunteers.

Radio electronics, and technology

- Kit building, understanding signal propagation. and building antennas.

We strive to put experienced members / volunteers, at the forefront, as a regular source of knowledge-sharing in the Denver Radio Club. We hope members participating in the DRC learning net will find it rewarding to share experiences, and learning, that will motivate more of our amateur radio community toward lifelong journeys as Hams.

If you have experience in, and have a passion for, any amateur radio related topics, please consider providing the DRC with presentations that will motivate other Hams to share your interests.

February Topics we have discussed:

- Hot spot: [forums.qrz.com/index.php?threads/zumspot-hotspot-kit-build.645134/](https://forums.qrz.com/index.php?threads/zumspot-hotspot-kit-build.645134/)
- DMR
  - DMR Basics: How to Make an Amateur Radio Codeplug
  - Programming DMR CHannels ([rmham.org](http://rmham.org))
- Mic Gain: <https://youtu.be/k8erluMdiBU>
- Fox Hunt Homing In - Radio Direction Finding, Foxhunting, ARDF
- Repeater Basics: What is a 2-way radio repeater and how is it used? BridgeCom Systems, Inc.
- Fusion: <https://youtu.be/OIHnCTGrkPI>
- Echo Link: Introducing EchoLink
- Kits: volt meter soldering kit. Voltmeter Soldering Kit from Jim Heaney on Tindie.

Great topics from our group. We certainly enjoy everyone's participation. Thanks to all.

If you are listening and don't yet have your license, you can contact us at the [W0TX web-site](http://W0TX.org), [w0tx@w0tx.org](mailto:w0tx@w0tx.org), or [elmer@w0tx.org](mailto:elmer@w0tx.org).

If we don't have the answer here on the net, we have a lot of experienced Hams in the club that can help.

Getting that first Technician license? Upgrading to General or Extra? We're here to help. You may also find Dave Casler's Amateur Radio Licensing Guides helpful: <https://dcasler.com/ham-radio/>

We would encourage those who have been Hams for several years to also join us. Your experience and input is welcomed.

Finding your place in the amateur radio community - -> Are you looking to be more involved, learn new skills, find a mentor or friends to share your amateur radio interest? Check out your local Denver Radio Club, and start making the most of your amateur radio license.



<http://www.arrl.org/public-service>

Use your communication skills to help keep your community safe!



<https://www.weather.gov/marine/ham>  
<http://www.warrenares.org/home/skywarn-weather-spotting>

During severe weather events, amateur radio operators bring significant resources to storm spotting, including an established communications system that can function in an emergency. They provide real-time information to partners like emergency management and forecasters at the national weather service. The data received from hams helps issue weather watches, warnings, and advisories.



SKYWARN Spotter Training Updates: [www.weather.gov/bou/spot\\_training](http://www.weather.gov/bou/spot_training)

What topics would you like to discuss? Join us Wednesday nights, 7:30 PM, 145.490, 100 Hz PL tone & linked to 448.625, 100Hz PL tone.

73,

Fred  
AA0JK

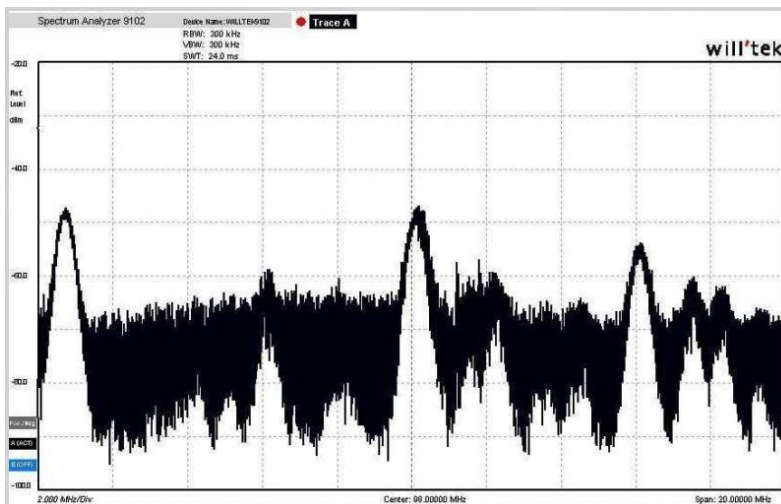
## MARCH PRESENTATION ANNOUNCEMENT

BY BILL RINKER, W6OAV

Ham radio operators, shortwave listeners, broadcast DXers, and other enthusiasts are usually quite aware of the growing RF radio noise issues. An increasing number of listeners report deteriorating reception, but they usually don't know why.

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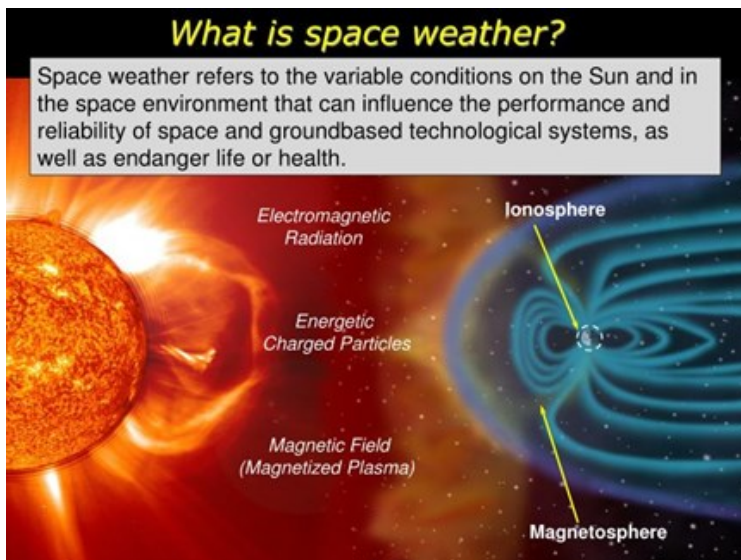
Steve will discuss the following: why search for radio noise, FM field noise tests and results, techniques for locating noise sources and many examples of noise sources.



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## TAKING NOTICE - SPACE WEATHER AND ITS IMPACT ON OUR DAILY LIVES

BY FRED HART, AA0JK



The space weather science research network is taking notice of the amateur radio operators experience in dealing with the solar activity as to its effect on HF communications, and electrical utilities. Amateur radio activity is a valuable data resource in monitoring solar activity. Hams have an empirical knowledge of space weather and offer a ready-made volunteer science resource.

Amateur radio has entered the spotlight as a primary means of monitoring our Sun's activity. Our ability to communicate via HF radio depends largely on the conditions in our upper atmosphere, the ionosphere.

To point out that as our civilization is becoming more and more advanced, it simultaneously becomes more prone to threats resulting from strong magnetic storms, especially since the magnetic shield of our planet is weakening. Therefore, solar coronal mass ejections such as those which led to the Quebec blackout of 1989 or the 1859 geomagnetic storm, are likely to have much more serious consequences for our lives in the future. Among the possible consequences, particular attention is being paid to the risk associated with the occurrence of disturbances in radio satellite communication, cell-phones, GPS, HF communications, local electric outages, as well as the impact of increased cosmic radiation on human health.

The Quebec Blackout was by no means a local event. Some of the U.S. electrical utilities had their own cliffhanger problems to deal with. New York Power lost 150 megawatts the moment the Quebec power grid went down. The New England Power Pool lost 1,410 megawatts at about the same time. Across the United States from coast to coast, over 200 power grid problems erupted within minutes of the start of the March 13 storm.

The Day the Sun Brought Darkness: [nasa.gov/topics/earth/features/sun\\_darkness.html](https://nasa.gov/topics/earth/features/sun_darkness.html)

<https://youtu.be/KqXtwAZFfUQ>

A "Perfect Coronal Mass Ejection" Could Be a Nightmare: [ar1.org/news/a-perfect-coronal-mass-ejection-could-be-a-nightmare](https://ar1.org/news/a-perfect-coronal-mass-ejection-could-be-a-nightmare)



## C4FM: DN OR VW - WHICH MODE TO USE?

BY MARSHALL SPILLER, KF0UV

If you are using one or more of the Yaesu transceivers featuring the C4FM mode of operation, you have noticed that there is a choice between the modes DN (Digital Narrow), and VW (Voice Wide), for voice communication. In your transmissions, the bandwidth is 12.5 KHz. VW mode uses the entire 12.5 KHz for your voice, and the claim is that the audio quality is superior to that of DN. Some say they can hear the difference, and others say they cannot.

So, what is the case for using DN mode? Here, the 12.5 KHz is split in half - 6.25 KHz is for the audio, and the other 6.25 KHz is for data. The data is significant for two reasons. The first is the more well known: Your GPS heading and distance from the transceivers that are monitoring you will be shown on their display if they are also GPS equipped.

The second reason is not as well known, but it is at least as important, if not more so, than the GPS data. It is Forward Error Correction (FEC). This detects and repairs audio signal errors at the same time that the signal is being transmitted, eliminating the need for retransmissions. So, communications from what would have been considered a fringe area distance without FEC, remain intact. And, like the GPS data, FEC is only used by the DN mode.

Thus, the DN mode shows us a strong advantage over VW mode.

## SWR - TUNERS AND BAL-UNS

NOTICE PROVIDED BY FRED HART, AA0JK

There is a great article on SWR, tuner and bal-uns at the following site: [wa2ooo.com/SWR.html](http://wa2ooo.com/SWR.html) Check it out!

## A COMPACT BALCONY HF ANTENNA

BY BILL RINKER, W6OAV

In today's world, a lot of hams are moving into apartments, condos or locations with antenna restrictions. They then are faced with putting together a small unobtrusive HF antenna. Figure 1 illustrates a compact vertical antenna that can be used on a balcony, a deck or any other small area. This antenna configuration was developed by PD7MAA (<http://pa-11019.blogspot.com/>). The antenna doesn't require quarter wave radials taking up floor space. Instead, a smaller quarter wave stub acts as a shortened resonant radial or counterpoise. The stub can be bent as necessary to avoid foot traffic.

The resonant quarter wave stub counterpoise is based on the fact that a quarter wave stub acts as an impedance transformer. Figure 2 shows a typical quarter wave coax stub. In Figure 2A an open at the far end of the quarter wave stub appears as a short (low impedance) at the analyzer. In Figure 2B a short at the far end of the quarter wave stub appears as an open at the analyzer. In the latter case the stub acts as an electrical loaded shortened radial or counterpoise.

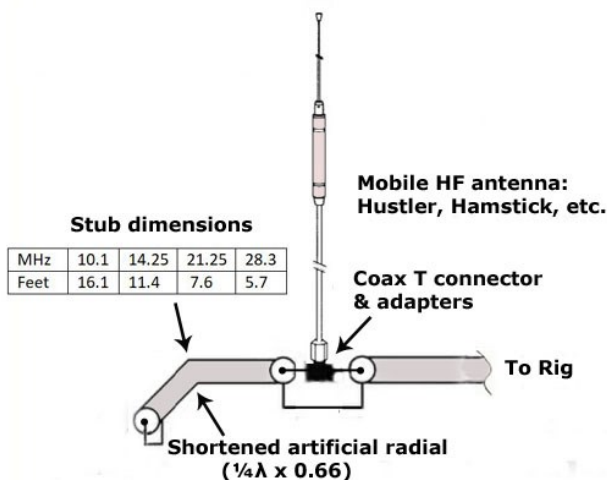
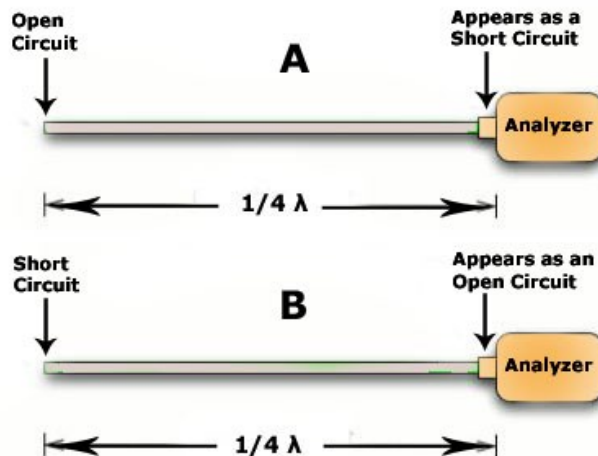


Figure 1 - A compact balcony antenna



**Figure 2 -  $1/4 \lambda$  coax impedance transformers**

The chart in Figure 1 shows the stub dimensions for the higher HF ham bands. These dimensions are approximate for coax with a 0.66 velocity factor (RG-8, RG-58, RG-59, RG-11U, RG-174, RG-213 and RG-214). The following procedure will provide a more precisely tuned coax stub:

1. Cut the coax a few inches longer than the length for the desired band as shown in Figure 1.
2. Solder a coax connector on the antenna end of the coax.
3. Connect an antenna analyzer to the coax connector.
4. Sweep the analyzer across the desired frequency range.
5. Note the frequency where the impedance is closest to zero (The frequency should be slightly lower than the band of interest).
6. Trim the open end of the coax until the impedance is closest to zero at the desired frequency.
7. Carefully solder a short between the coax's open end center conductor and the shield.
8. Attach the stub to the antenna and tune the vertical to the desired frequency.

The procedure above is based on the fact that an open ended quarter wave coax appears as a short to the analyzer at the opposite end (step 5 above). Once the quarter wave length resonant frequency is achieved in step 6 and the short added (step 7), the stub appears as an open ended quarter wave resonant stub.

A nice quarter and half wave coax stub calculator can be found at:

<http://www.arcticpeak.com/antennapages/quarterwavestub.htm>

References are available that discuss the Stub Tuned Radial Kit for roof mounted Butternut HF6V and HF9V vertical antennas:

<https://forums.qrz.com/index.php?threads/butternut-stub-tuned-radials.142068/>

<https://static.dxengineering.com/global/images/instructions/but-rmk-ii.pdf>

<https://www.manualslib.com/manual/1140304/Butternut-But-Hf6v.html?page=20#manual> (page 20)

A blog is available that discusses shorted quarter wave stubs, Ham Stick whips and quarter wave wires as counterpoises for vertical antennas:

<https://forums.qrz.com/index.php?threads/shorted-1-4-wave-stub-s-for-counterpoise-s-on-a-balcony-screwdriver.541274/>

## FILLING THE USGS 'DONUT HOLE'

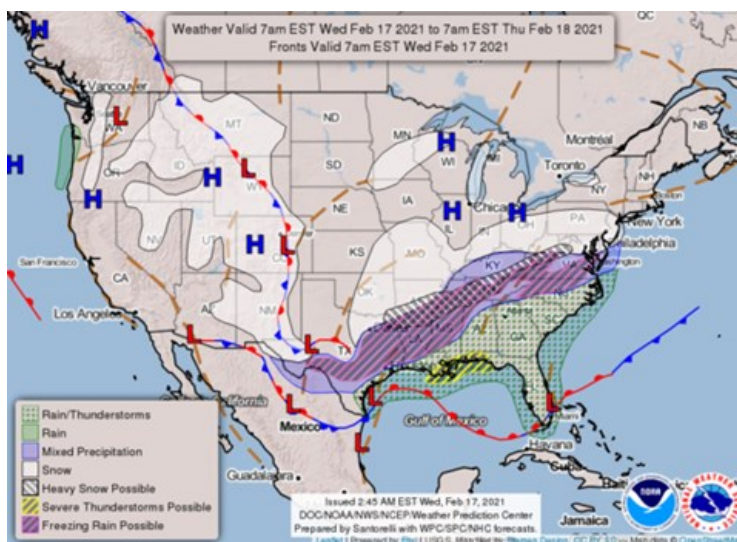
WRITTEN BY ADAM DAVIDSON, W9ASH  
 LINK PROVIDED BY FRED HART, AA0JK

The following link is for a good article on Hams providing emergency communications and their use of Winlink. Take a look and pass it on. [winlink.org/content/feature\\_article\\_filling\\_usgs\\_donut\\_hole](http://winlink.org/content/feature_article_filling_usgs_donut_hole)



## ABERRANT WEATHER CREATES HAZARDOUS CONDITIONS ACROSS US REGIONS

BY FRED HART, AA0JK



Severe weather has caused power and telecommunications outages, and ARRL Amateur Radio Emergency Service (ARES) volunteers in southern states were called upon to help fill the resulting communication gaps.

Here is a recent story from the ARRL: ARES Volunteers Reported Responding to Severe Weather: [arrl.org](http://arrl.org)

As temperatures plunged and snow and ice whipped the states, power grids collapsed, followed by water systems. Tens of millions huddled in frigid homes that slowly grew colder, or fled for safety. Twenty nine million people were grasping for survival.

Thousands of people sought refuge from their freezing homes in warming shelters. Others sat in their cars, hundreds were hospitalized for carbon monoxide poisoning. A woman and her young daughter died after running their car inside a garage. An 11-year-old boy was found dead after his family's mobile home lost power.



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A shortage of drinkable water emerged.

Clean energy? System failures occurred in every sector.

Wind turbines and solar panels froze A major nuclear plant lost half of its generation, and there were massive failures in coal, oil, and natural gas.

Overwhelmed government agencies cannot be relied upon.

Preppers, are you ready for future unforeseen catastrophes?

[trueprepper.com/basic-emergency-plan](http://trueprepper.com/basic-emergency-plan)

As radio amateurs we are equipped to provide emergency communications when called upon, but are you prepared to first provide for yourself and your family first as in the catastrophic events we are seeing today?

[hamradioprep.com/ham-radio-for-preppers/](http://hamradioprep.com/ham-radio-for-preppers/)

[skilledsurvival.com/preppers-checklist/](http://skilledsurvival.com/preppers-checklist/)

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## DMR, FUSION OR D-STAR

BY BILL RINKER, W6OAV

Are you considering trying out one of the popular ham digital voice modes (DMR, Fusion and D Star) but do not know where to start? Well, there are several good YouTube videos and blogs that will help you get started.

The video below will help you to decide which digital mode you would like to try. The video compares and contrasts the features of the three digital modes:

<https://www.youtube.com/watch?v=l3qeWncX5vk>

The video below will familiarize you with all the confusing digital voice terms i.e., modes, reflectors, talk groups, rooms, code plugs, color codes etc.:

<https://www.youtube.com/watch?v=RTc4Fyqjflc>

There are two blog posts that present a fair unbiased opinion on each of the digital voice modes at:

<https://n6pet.com/digital-voice-war/>

<http://www.mikemyers.me/blog/2016/2/19/d-star-dmr-fusion-which-is-right-for-you>

So, why try one of these digital voice modes? Well, they provide easy access to hams worldwide even when using an HT. There is no dependence on outside HF antennas or good shortwave propagation. When using a "Hotspot" there is no dependence on repeater access. (A hotspot is a device that enables a ham with a digital radio and internet connectivity to connect directly to the various worldwide digital voice networks).



## TRY THE DRC 220 MHz REPEATER

By BILL RINKER, W6OAV

(Editor's Note: W0GV mentioned in the *President's Message* that the 220 is currently offline. This article was written by W6OAV awhile ago and will be helpful for when it is back online.)

The DRC has recently upgraded the 220 MHz repeater and soon will upgrade the antennas. The club is encouraging members to use the repeater. Some members may desire to build a 220 MHz antenna. There is not a lot of information on the internet regarding building 220 MHz antennas. The purpose of this article is to provide information for two easy to build inexpensive 220 MHz antennas, namely a 1/2 λ Slim Jim and a 1/4 λ Ground Plane.

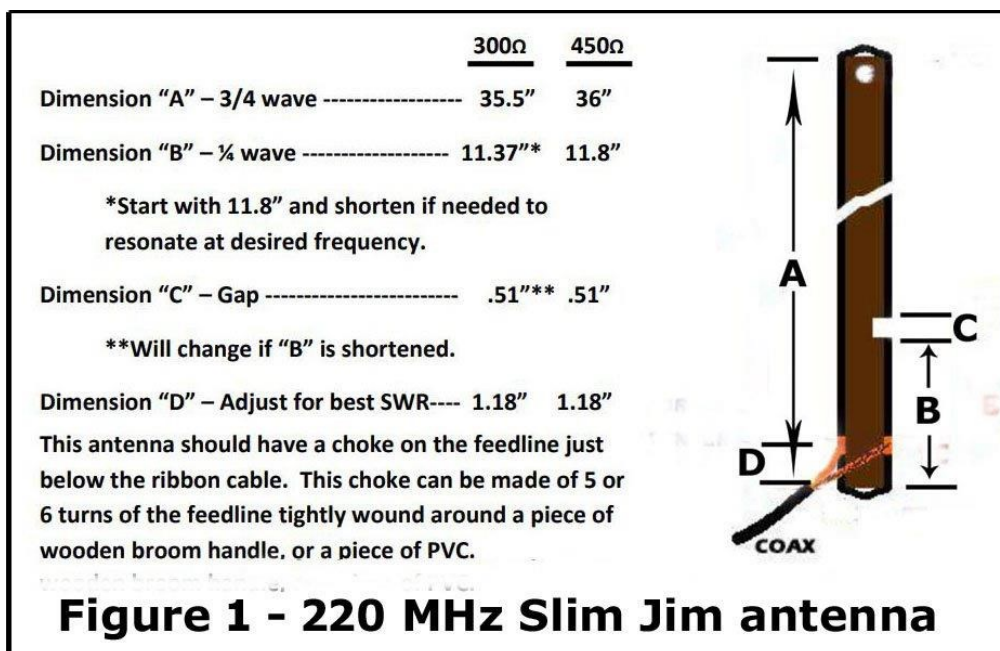
### Slim Jim

The Slim Jim is an end fed 1/2 λ folded dipole fed with a 1/4 λ matching section. See Figure 1.

The Slim Jim can be made out of either 300 ohm twin lead or 450 ohm ladder line. This neat little "roll up" antenna will prove useful at home, for portable operation or for improving an HT's coverage in the fringe areas. Figure 1 shows all the appropriate measurements for either a 300 ohm twin lead or 450 ohm ladder line version. The steps below describe the construction:

- If you are using twin lead begin by cutting a piece 36.5" long. If you are using 450 ohm ladder line, begin by cutting a piece 37" long.
- Remove 1/2" of insulation from the wires at each end of the antenna.
- Twist the exposed wires together and solder.
- Measure distance B from the bottom of the antenna and cut a 0.51" piece out of one wire.
- Remove a short piece of insulation from each wire at distance D from the bottom end.
- At D solder the coax braid to the short wire and the coax center lead to the long wire.
- Cover the joint at D with electrical tape.
- Punch a small hole at the top end of the antenna to permit using a string to support the antenna from any convenient place.
- Adjust distance B to obtain the desired resonant frequency.
- Adjust distance D to obtain the best SWR.
- For best performance, create a coaxial choke as described in Figure 1.

Note: If the top end of the antenna is not shorted, the antenna becomes a J Pole. The performance of the Slim Jim and the J Pole are identical. The Slim Jim is usually preferred as it is a bit easier to handle and has a bit more bandwidth.



### Ground Plane

Figure 2 shows an easy to construct 220 MHz  $1/4 \lambda$  Ground Plane consisting of an SO-239, 66" of wire (#12 copper wire, welding rods or coat hanger) and four sets of 4-40 nuts and bolts.

The steps below describe the construction:

Cut the radials to a length of 13".

Loop one end of each radial to fit around the 4-40 bolts.

Fasten the radials to the SO-239 using the 4-40 nuts and bolts.

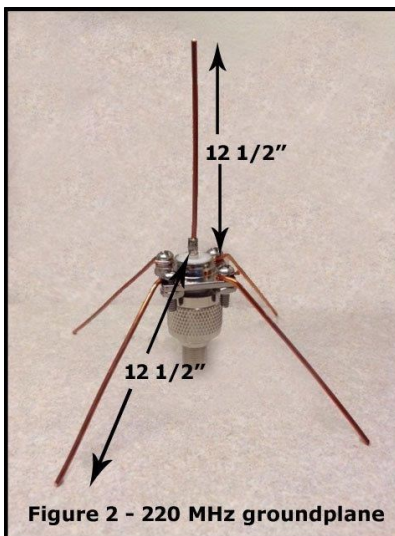
Bend the radials down at a 45 degree angle.

If necessary, trim the radials to a length of  $12 \frac{1}{2}$ " from the center of the SO-239.

Cut the vertical to a length of 13" and solder to the SO-239 center conductor.

Mount the antenna as desired and connect the coax.

Trim the vertical element  $1/8$ " at a time until the desired resonant frequency is obtained.



### Summary

The gain and radiation patterns of the Slim Jim, the J Pole and the  $1/4 \lambda$  Ground Plane are pretty much identical. The take off angle of the Slim Jim and the J Pole is slightly lower to the horizon than that of the  $1/4 \lambda$  Ground Plane. Which antenna to build depends more upon its intended purpose. The Slim Jim lends itself to portability and is easier to hang from structures. Some builders actually install it inside 200PSI PVC tubing. The Ground Plane is easier to build and tune. However, it isn't as easy to mount and isn't as portable as the other antennas. The choice of which antenna to build is more a matter of what will be done with the antenna rather than performance.

### References

The sites below show that the Slim Jim, the J Pole and the  $1/4 \lambda$  Ground Plane produce the same radiation patterns and the same gains.

The following site compares the Slim Jim to the J Pole and shows that their performance is equal:

<https://www.hamradio.me/antennas/slimjim-vs-traditional-j-pole-antenna.html>

The following site compares the J Pole to the  $1/4 \lambda$  Ground Plane and shows that their performance is equal:

<https://www.hamradio.me/nec-shootouts/monopole-vs-jpole-eznc-shootout.html>

The following video compares a J Pole with a  $1/4 \lambda$  Ground Plane.

<https://www.youtube.com/watch?v=dRZbE9nF1Dw>

The following site has a Slim Jim/J Pole calculator:

<https://m0ukd.com/calculators/slim-jim-and-j-pole-calculator/>

## CHASING THE SACRAMENTO POLICE RADIO JAMMER

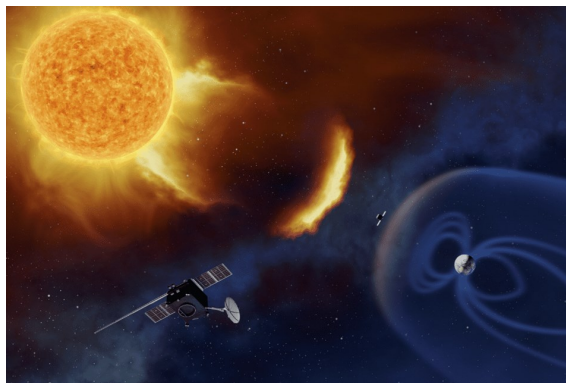
PROVIDED BY GERRY VILLHAUER, W0GV

Funny and interesting article from the Turlock Amateur Radio Club's February 2021 newsletter, the *ARC-OVER* [w6bxn.org/wp-content/uploads/February-2021-Arcover.pdf](http://w6bxn.org/wp-content/uploads/February-2021-Arcover.pdf)



## SOLAR GEOPHYSICAL ACTIVITY REPORT

PROVIDED BY FRED HART, AA0JK



February solar activity started out calm. Coronal holes on the south were only setting a cosmological watch as solar wind was forecast to amplify in the following hours. Sun spots were turning around the limb on the far-side of the solar disc. A couple smaller spots were on the north, nothing incoming reported at the time.

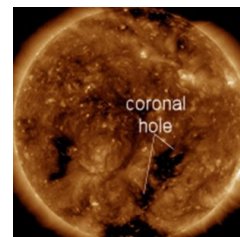
NASA was reporting that SDO was inoperative. Solar wind was quiet in geospace and magnetic field.

Geomagnetic storm watch: NOAA forecasters said that minor G1-class geomagnetic storms were possible on February 1-2 when a solar wind stream was expected to hit Earth's magnetic field. The gaseous material was flowing from a southern hole in the sun's atmosphere. Solar wind speeds of 600+ km/s were expected when the stream was to arrive, sparking possible disruptions in HF radio propagation.

Image Credit: SDO/AIA

Solar wind flowing from this southern coronal hole was expected to reach Earth on February 1-2.

February 2nd - A stream of solar wind was buffeting Earth's magnetic field, causing magnetic unrest around the poles. The unrest was showing signs of escalating into a G1-class geomagnetic storm according to NOAA forecasters.



Co-rotating interaction region.

In the wake of the CIR, solar wind was blowing around Earth at speeds near 600 km/s.

February 4th - Solar activity was quiet. Minor filament activity. Coronal hole stream activity plateaued.

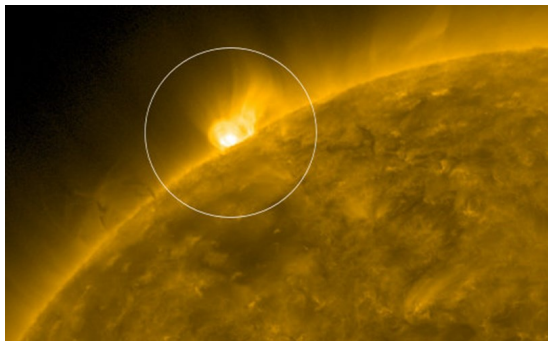
February 5th - Solar sector boundary crossing: Earth was crossing a fold in the heliospheric current sheet, a vast wavy structure in interplanetary space separating regions of opposite magnetic polarity. The crossing, called a "solar sector boundary crossing," was expected late on February 6th and was expected to trigger geomagnetic activity around Earth's poles

Sun was busy sending bursts of fast solar wind towards Earth from several coronal holes that were rotating through the Earth-strike zone, one after another.

Equatorial facing coronal holes were bursting with streams of solar wind towards Earth. Minor cracks in the Earth's magnetic field were opening as the interplanetary magnetic field near our planet tipped south. Solar wind was due to flow through the gaps, igniting polar auroras.

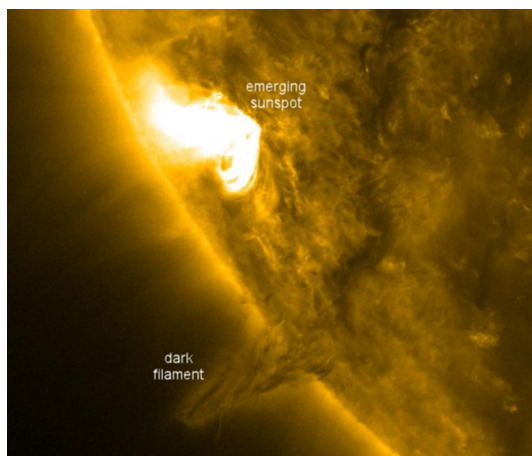
Minor geomagnetic storm: A minor G1-class geomagnetic storm was underway on February 7th as Earth entered a high-speed stream of solar wind. The gaseous material was flowing faster than 500 km/s from an equatorial hole in the sun's atmosphere.

A sunspot in the offing? The face of the Sun was blank, no sunspots. However, the sunspot number might not be zero for long. The magnetic canopy of a new active region was just popped up over the Sun's southwestern limb.



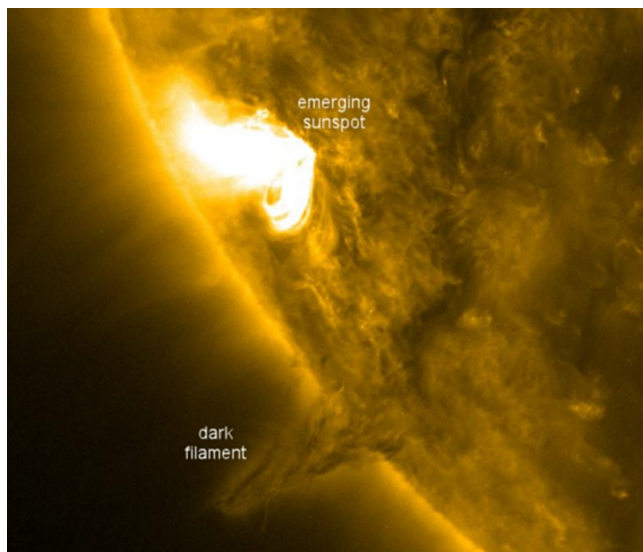
NASA's Solar Dynamics Observatory took this picture during the early hours of February 7th. It was herald to emerge as a new sunspot. The dark cores were expected to rotate into view within the following 24 hours.

February 9th - Sunspot genesis. A new sunspot was emerging at the limb of the Sun's southern hemisphere. It was small and quiet, posing no threat for strong flares. If the region continued to grow, it was expected to be assigned an official number. (AR2802).





The sunspot was breaking through the Sun's surface right next to a dark magnetic filament. Rapid evolution of the sunspot threatened to destabilize the region, causing the filament to erupt.



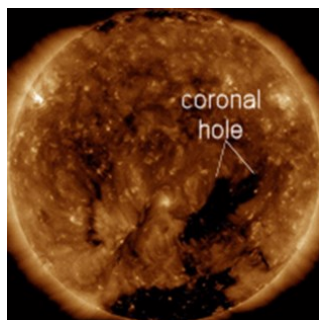
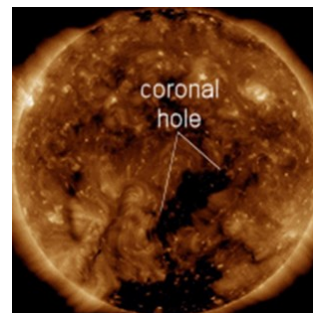
February 14th - Solar minimum conditions were in effect. The Sun has been blank (without spots) in 2021 60% of the time, including the last 10 days in a row. Solar flare activity was nil, and the Sun's X-ray output had flat-lined. This surprising quiet spell comes on the heels of a surge in solar activity late last year. New Solar Cycle 25 is off to a sputtering start.

Solar activity woke up and brought a huge filament that stretched across the entire Earth-facing side of the solar disc. Eruption while in this position would launch an Earth-directed solar storm.

In addition fast solar wind from two coronal holes were hitting Earth. The fast moving solar wind was keeping us at active levels and expected to last for several days. Despite this activity, the solar flux continued to remain in the low 70's, which resulted in marginal radio propagation on Earth's day-side. There were a few bright regions in STEREO's view, which meant that the solar flux might get a boost into the mid-70s over the following week, but marginal propagation conditions were expected to continue throughout the week.

February 19th - AR2802 and AR2803 end a 14 consecutive day string of spotless days.

Image Credit (right): SDO/AIA Solar wind flowing from this coronal hole should reach Earth on February 21-22.



Saturday, February 20, 2021 - Image Credit (left): SDO/AIA

Earth was entering a stream of solar wind flowing from this coronal hole.

NOAA forecasters were reporting a chance of G1-class geomagnetic storms, as a stream of high-speed solar wind engulfed Earth. The gaseous material was flowing faster than 500 km/s from an equatorial hole in the sun's atmosphere.

CIR hits Earth. A co-rotating interaction region (CIR) hits Earth's magnetic field high in the polar region above Norway.

A CIR is like a mini-CME (coronal mass ejection). It's a transition zone between slow- and fast-moving streams of solar wind. Shock-like density gradients inside CIRs often do a good job of disrupting Earth's upper atmosphere.

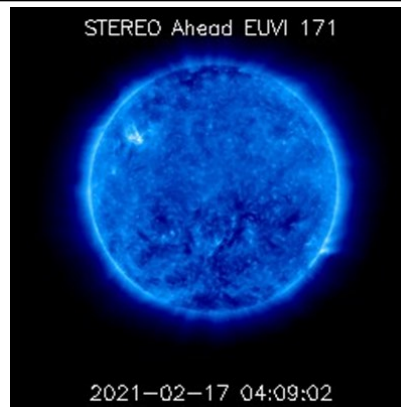


Image Credit: SDO/HMI

Sunspot AR2803 was slowly growing and had produced a B-class solar flare.

Dark filament eruption on the Sun. A dark filament of magnetism flung itself away from the Sun, February 20th. The eruption split the Sun's atmosphere, creating a broad "canyon of fire" and hurled a CME into space. NOAA analysts were modeling the CME to determine if it would hit Earth in the following days ahead.

NOAA Geomagnetic Activity Observation and Forecast: The greatest expected Kp for Feb 22-Feb 24 2021 was 4.

NOAA Radio Blackout Activity and Forecast: No R1 (Minor) or greater radio blackouts were expected. No significant active region flare activity was forecast.

Ham Radio Space Weather Network: A new article just published in EOS describes how ham radio is the new frontier in space weather research. Interested? All you need is a Personal Space Weather Station to join a global network of scientists studying how solar activity affects our planet. Learn more during the 2021 HamSCI Workshop, held virtually using Zoom on March 19th and 20th. HamSCI Workshop 2021 page at [hamsci.org/hamsci2021](https://hamsci.org/hamsci2021).

Article: Ham Radio Forms a Planet-Sized Space Weather Sensor Network: [eos.org/features/ham-radio-forms-a-planet-sized-space-weather-sensor-network](https://eos.org/features/ham-radio-forms-a-planet-sized-space-weather-sensor-network)

73,

Fred  
AA0JK

**~Editor's Note:** We would love to publish a monthly column profiling DRC members' stories about how they got into the ham radio hobby, their interests and backgrounds. The purpose of the column is to introduce DRC members to each other and to find commonalities between them. Please use Microsoft Word set to Arial and 10 point, and submit your story to [drc.editor@gmail.com](mailto:drc.editor@gmail.com).

**PAST ROUND TABLE PAGES**

PROVIDED BY WOODY LINWOOD, W0UI

A page from the September 1956 multi-page edition. It is the second oldest known remaining Round Table.

-7-

a ladder, resulting in a very painful injury to his heel. Mel spent several days on crutches, but is rapidly mending. Best wishes for a speedy recovery, Mel!

## FOR SALE OR TRADE

~~W0GVA~~, George Chenoweth, has a model EX signal shifter for sale or trade. George can be reached at 9560 W. 11th Avenue, Phone BE 7-1187.

\* \* \*

## NOVICE'S, SLOW DOWN!

Situation: General working novice at about 10 words a min., c.w. - novice's wife, also a novice, took over the key, signed her call letters and yakked away - turned it back to the general with her call letters.

Result: General so busy trying to copy, he never knew the XYL was even on!

Remedy: Code class for generals who seldom work c.w. HI!

\* \* \*

Robert L. Knodel, ~~K0EVO~~, Editor  
118 W. Irvington PL., Denver  
Phone: RA 2-8147

### DRC's EMERGENCY RESPONSES

In the event of a disaster in the metro area, please monitor our repeaters on 145.490/448.625 (primary) and 449.350 (secondary).

The emergency Net Control Operator will provide information and/or requests to members for assistance.

[W0TX Repeater Directory](#)



#### Note to DRC Members:

Our club depends on the involvement and participation of YOU, our members. Do you have a skill or interest that could help the club. Maybe you want to volunteer to be on a committee? Like to write? Have ideas for improving what we do? Speak up and let someone know, all ideas are welcomed and participation is always helpful. ~Editor

RANDOM SITE OF THE MONTH  
[ACARES - Arapahoe ARES](#)

#### THE ROUND TABLE ARCHIVE

Go to: <http://www.wotx.org/roundtables.htm>

#### THE ROUND TABLE ARTICLE INDEX

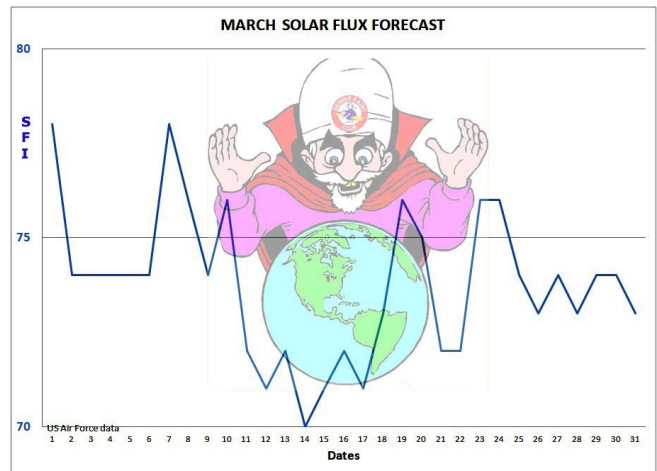
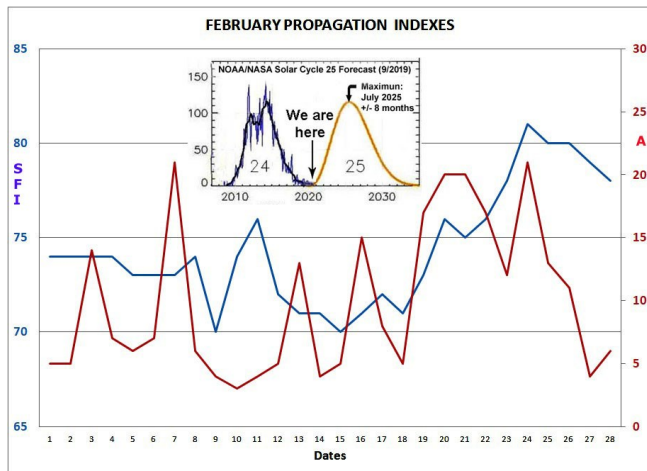
Go to: <http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf>

## PAST & FUTURE PROPAGATION CONDITIONS

By Bill Rinker, W6OAV

The charts below show the Solar Flux and "A" indexes for last month and the forecast for this month's Solar Flux index.

Refer to the September 2010 *Round Table* for more complete information on interpreting these charts, which is available at: [http://www.w0tx.org/RoundtableArchive/2010-RoundTables/RT201009\(SEP\).pdf](http://www.w0tx.org/RoundtableArchive/2010-RoundTables/RT201009(SEP).pdf)



## UPCOMING EVENTS HAMFESTS & CONVENTIONS

Event	Date	Location	Sponsor Website
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All cancelled.

## UPCOMING QSO PARTIES

The following are the Contests not sponsored by the ARRL. Please submit additions for future issues.

State/Province	Start Date	End Date	Sponsor Website	Notes
Idaho	03/13/2021	03/14/2021	<a href="#">Idaho QSO Party</a>	
Oklahoma	03/13/2021	03/14/2021	<a href="#">Oklahoma DX Association</a>	
Wisconsin	03/14/2021	03/15/2021	<a href="#">West Allis Radio Amateur Club</a>	
Virginia	03/20/2021	03/21/2021	<a href="#">Virginia QSO Party</a>	
Louisiana	04/03/2021	04/04/2021	<a href="#">Louisiana Contest Club</a>	
Mississippi	04/03/2021	04/04/2021	<a href="#">ARRL Mississippi Section</a>	
Nebraska	04/03/2021	04/04/2021	<a href="#">Nebraska QSO Party</a>	
Georgia	04/10/2021	04/11/2021	<a href="#">Georgia QSO Party</a>	
New Mexico	04/10/2021	04/11/2021	<a href="#">New Mexico QSO Party</a>	
North Dakota	04/10/2021	04/11/2021	<a href="#">ARRL ND Section Manager</a>	
Michigan	04/17/2021	04/18/2021	<a href="#">Michigan QSO Party</a>	
Ontario	04/17/2021	04/18/2021	<a href="#">Contest Club Ontario</a>	
Florida	04/24/2021	04/25/2021	<a href="#">Florida QSO Party</a>	

**ATTENTION**

**SUPPORT THE DRC FROM YOUR AMAZON PURCHASES**

You can now support your Denver Radio Club when you make purchases from Amazon.com. Amazon Smile donates 0.5% of your purchase to the non-profit (501.c.3) organization of your choice. This is at no additional cost to you. To support the DRC just visit [smileamazon.com](https://smile.amazon.com). Select Denver Radio Club, Inc. as the organization you want to support and proceed with your order as usual. Amazon Smile will credit the DRC automatically. Thank you for your support.

**DRC's Trading Post**

Speaking of purchasing don't forget you can find **locally-sourced, ham-grown** merchandise at:  
<https://www.w0tx.org/trade.htm>










**DRC REPEATERS**

BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090MHz (-1MHz) 107.2Hz PL	
Packet	145.05MHz<>14.105MHz	2m / 20m gateway. Useable by Technicians on 2m.
2m	145.490MHz (-) 100Hz PL	Linked to 70cm / 448.625MHz. Primary frequency during emergency net.
2m	147.330MHz (+) 100Hz PL	Local area. Has voting receivers. Does not TX a PL.
2m	147.330MHz (+) 131.8Hz PL	Test mode operation. Send signal reports to Tech Committee.
1.25m	224.380MHz (-) 100Hz PL	
70cm	447.825MHz (-) DCS~073; NB 12.5; +/- 2.5	Saint Anthony's. Note: This is a narrow band repeater requiring DCS.
70cm	448.625MHz (-) 100Hz PL	Linked to 2m / 145.490MHz. 1° disaster net freq.
70cm	449.350MHz (-) 100Hz PL	Wide area coverage with Echolink, node # 4140. Secondary frequency during emergency net.
70cm	449.775 MHz (-)	Yaesu digital, C4FM, Wires-X, DN, VW & Data. No analog FM. W0TX Room 40931.
70cm	446.7875MHz (-)	BrandMeister Repeater: Slot 1 – Wide Area Traffic, Slot 2 – Local Talk Group 310804

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<b>MARCH 2021</b>		<i>DRC Net Sundays at 8:30 p.m. on 145.490 / 448.625 (no PL)</i>				
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3 <b>Learning Net</b> 7:30 p.m. 145.490 / 448.625 (No PL)	4	5  Last Quarter	6 <b>ARRL DX - Phone</b> Starts 0000 UTC
7 <b>ARRL DX - Phone</b> Ends 2359 UTC	8	9	10 <b>Learning Net</b> 7:30 p.m. 145.490 / 448.625 (No PL)  <b>School Club Cont.</b>	11	12	13  New Moon
14 	15	16	17 <b>DRC Online Meeting</b> Elmer 6 p.m. Meeting 7 p.m. 	18	19	20 
21  First Quarter	22	23	24 <b>Learning Net</b> 7:30 p.m. 145.490 / 448.625 (No PL)	25	26	27
28  Full Moon	29	30	31 <b>Learning Net</b> 7:30 p.m. 145.490 / 448.625 (No PL)			

See [arrl.org/contest-calendar](http://arrl.org/contest-calendar) for additional details about contests.

## DRC BOARD OF DIRECTORS

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Board Member	KB0CHT	Jeff Irvin	Check Roster	Check Roster

## DRC STAFF AND VOLUNTEERS

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### Please Let Us Know

Over the years we occasionally hear from hams who have read the Round Table in other states and countries around the world. We appreciate the comments and we would like to know where you are located. So if you live outside the Front Range or Denver Metro Area and read the newsletter either online, email or hard copy please send a short note via email with your *City, State or City, Country*.

We will publish it at a later date in our new regular feature called Round Table Round World.

To respond to this request send your information to [drc.editor@gmail.com](mailto:drc.editor@gmail.com).

*Subject: I'm located in...*

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DRC members - this is your newsletter. Please email your club or amateur radio related suggestions to the editor. Members are the heart of The Denver Radio Club, so if you have an expertise or an interest in a particular segment of ham radio that you'd like to write about, you may email your submissions to [drc.editor@gmail.com](mailto:drc.editor@gmail.com). The submission deadline is the 25th of the Month. ~ Editor