



# ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917

March 2019

## PRESIDENT'S MESSAGE

BY GERRY VILLHAUER, W0GV

Hello DRC Members,

I am ready for spring! How about you? Enough of this cold weather for me. In my mind, the cold weather is over after March 1st. Time will tell if I am correct on that this year.

I hope you all agree that our February program was a bit different and I believe turned out very successful. We had a presentation from Dr. Ed Fong (WB6IQN) from California via Skype. Ed is on staff at UC Santa Cruz where he teaches RF Wireless Communications and Design. He explained some of the theory of his patented VHF, UHF and Multiband antennas and answered questions from the audience. We always cross our fingers when we try something new as far as the form of presentation. As we have observed in prior presentations, sometimes technology can let us down. Fortunately this time, the Skype worked well and the presentation went on without any major problems. This may open the door for future presentations from other presenters not located in our area. If you know of a quality program or presenter that you think would be good for our group, please pass along the information to me or Bill (W6OAV). We are always in search of good material for our monthly programs.

Are you interested in learning about the development of radios before and during WWII? Interested in learning about the sophisticated systems used by the German Luftwaffe, Royal Air Force and the American Air Corps in WWII? Plan to attend our March meeting. Peter (KC0DGM), will not only cover these topics, he will also have a display of some of these WWII radios. Mark your calendar for Wednesday, March 20th. This will be a rare opportunity to see firsthand some real radio history.

We are still in the winter weather season and as you all know, the weather can change quickly. If travel conditions are deemed to be unsafe, we will put out a cancellation notice or other related information in the timeliest manner possible. If the weather looks questionable on a meeting night, listen to our 145.49/448.625 and 449.350 repeaters for last minute information prior to setting out to the meeting.

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 Roundtable.

73 for now,

Gerry  
W0GV  
President



### The DRC needs you!

Please contact W0GV ([w0tx@w0tx.org](mailto:w0tx@w0tx.org)) if you are interested in helping with:

Chairperson for DRC Field Day in 2019: Assistance and guidance will be given to new chairperson. You will have help.

## 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:

Robert Mesenbrink - NB0BN	Tomi Jaakko Valkkila	Jonathan Rollins - KC8HCF
Brandon Edmunds - KE0UFU	Christopher White - AD0XW	Francis Lis - KE0SIA
Fred Gilmore - W0LPD	Ken Edwards - WW5A	Owen Fulkerson - KE0SJH
John Curtis - W0CAR	Thomas Bloom - KE0OJI	Rhonda Lis - KE0SMC
Patricia Gilmore - K7HER	Howard Smith - N0BQ	Robert Larson - KC0VRH

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.

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## TECHNICAL COMMITTEE REPORT

BY BILL RINKER, W6OAV

The following is an overview of current issues.

### DRC/TSA Aurora Site

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

Status: The Board is reviewing the MOU received from the TSA and corresponding with the TSA relative to the installation of wiring and coax runs.

### Station 4 Remote Power Control

Goal: Install Internet controlled power outlets.

Status: WG0N has installed an Internet controlled outlet power strip at Station 4. WG0N and KE0HFH will reconfigure the equipment and test the system ASAP.

### 6 Meter Repeater

Goal: Troubleshoot audio and "buzz" issues.

Status: W0GV, WG0N and N0ETV will organize a work party when the winter weather is favorable to troubleshoot the issues and to routine the systems.

### Develop Fusion Repeater Tech Support

Goal: Train several tech committee members to assist with programming and maintaining the Fusion Wires-X repeater system.

Status: K0SVT has volunteered to do the training after he finishes moving in March.

### Generate DRC Membership Interest in Fusion

Goal: Educate the membership about Fusion and the DRC Fusion repeater.

Status: AE2L is scheduled to present his comprehensive Fusion PowerPoint at the June meeting.

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## FEBRUARY MEETING - WHAT'D I MISS?

By BILL RINKER, W6OAV

There was a large audience this month. The meeting started with introductions after which the meeting was turned over to Dr Ed Fong, WB6IQN, who is on the faculty of UC Santa Cruz- Silicon Valley. Ed currently teaches RF Wireless Communications and I/O Design Fundamentals. Ed gave his presentation via Skype.

Ed covered the principles of J Pole vertical antennas and the problems of developing efficient dual band VHF/UHF J Poles. Many versions exist but the UHF angle of radiation of most dual band J Poles is about 45 degrees above the horizon whereas the angle of radiation of single band VHF and UHF J Poles is about 15 degrees. Ed's J Pole has the same low 15 degree VHF and UHF radiation angle. Ed then covered the principles of quarter wave stubs which are the heart of his patented dual band DBJ-2 J Pole. He then described how the DBJ-2 works.

An in depth discussion of single band and dual band J Poles can be found in the March 2007 QST. Instructions are available in the article for building Ed's J Pole. Or one can order the inexpensive DBJ-2 J Pole by going to <https://edsantennas.weebly.com/> or ordering from eBay. The Vaca Valley Radio Club has posted a YouTube of Ed's presentation on [https://www.youtube.com/watch?v=E\\_IBni6vvMc](https://www.youtube.com/watch?v=E_IBni6vvMc).

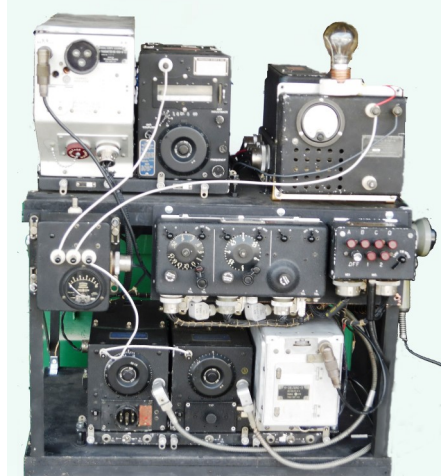
PS. A few years ago I built a DBJ-2 for a friend. Later I ordered a DBJ-2. They work well.



## MARCH MEETING PRESENTATION

By BILL RINKER, W6OAV

Interested in learning about the development of radios before and during WWII? Interested in learning about the sophisticated navigation systems used by the German Luftwaffe, Royal Air force and the American Air Corps in WWII? If so, plan to attend the March club meeting. Peter, KC0DGM, will not only cover these topics, he will also have a display of some of these WWII radios as shown in the accompanying photo.



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**LEARNING NET REPORT**

BY FRED HART, AA0JK



Thanks go out to our Net Controllers: Doron (K1DBC), Alex (KS0E), and Jim (AD0ZM).

The following topics were discussed this past month:

- Centennial Ten-Ten Net: <http://www.ten-ten.org/index.php/chapters/chapter-nets>
- Ten-Ten International Net, or 10-10 for short. <https://www.ten-ten.org/>
- Quartz Fest
- Data Burst/EMI around 145mhz emanating from possibly a smart meter
- SDR Dongle
- EOSS: Edge Of Space Science Balloon Flights Carrying Amateur Radio Payloads
- EXCEL Meters and RFI interference
- ARRL's New Podcast for New Hams: [arrl.org/news/arrl-launching-new-podcast-g geared-toward-new-radio-amateurs](http://arrl.org/news/arrl-launching-new-podcast-g geared-toward-new-radio-amateurs)
- Programming Your Radio with RT Systems: <https://www.rtsystemsinc.com/>
- RT Systems Tutorials: <https://www.rtsystemsinc.com/Articles.asp?ID=439>

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 via [w0tx@w0tx.org](mailto:w0tx@w0tx.org) or [elmer@w0tx.org](mailto:elmer@w0tx.org).

We are always looking for additional net control operators. If you would like to participate we can help you with the basics of becoming a net controller. This is a great opportunity to learn and get experience running a net.

Net controllers are always needed to perform Emergency Communications services. The Amateur Radio Emergency Service® (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment, with their local ARES leadership, for communications duty in the public service when disaster strikes. <http://www.arrl.org/ares>. In the event of emergencies such as floods, fires, or other public service, the amateur radio community is always ready to help. If you have an interest in participating, when the need arises, learn and train now to be prepared. For additional information contact our EmComm Coordinator: Mike Vespoli (KE0HFH) at [emcomm@w0tx.org](mailto:emcomm@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. Questions can also be submitted on the YAHOO Learning Net web page <https://groups.yahoo.com>. Here you will also find information from past activity that you might find of interest.

Getting that first Technician license? Upgrading to General or Extra? We're here to help. We would encourage those who have been Hams for several years to also join us. Your experience and input is welcomed. What topics would you like to discuss? Join us Wednesday nights, 7:30 PM, 145.490, 100 Hz PL tone & linked to 448.625, 100 Hz PL tone.

(Note: The third Wednesday of the month is devoted to the DRC club meeting. See the [W0TX web site](#) for additional information.)

73,

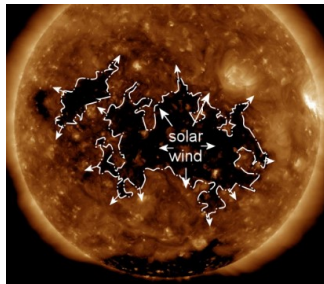
Fred  
AA0JK



**SOLAR UPDATE**

PROVIDED BY FRED HART, AA0JK

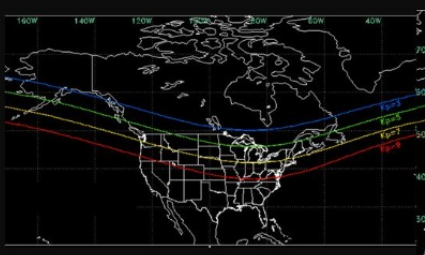
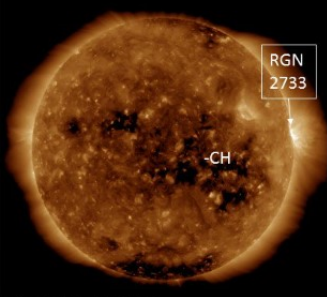

Incoming Solar Wind



G1

Minor geomagnetic storm watch in effect:  
31 January and 1 February, 2019

*Most likely area of Aurora Extent:* to the vicinity of the green line (Kp=5)

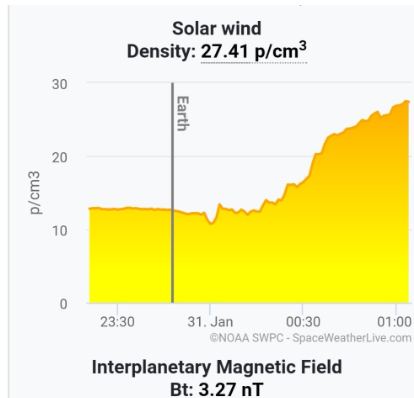




300/AA 193 2019-01-30 15:39:04 UT

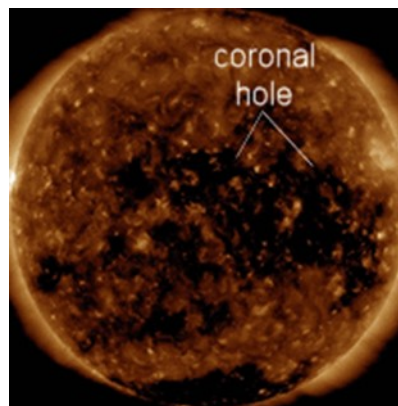
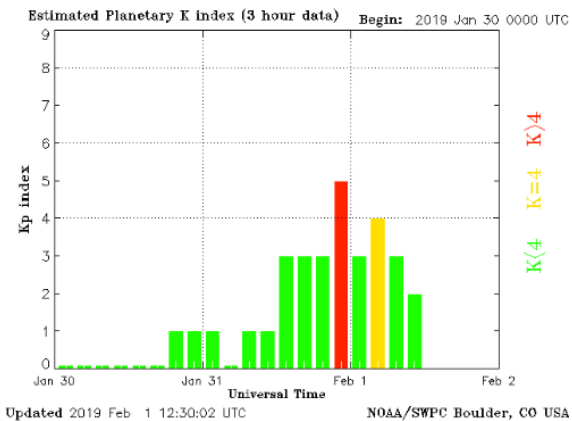
For updating aurora visibility information go to the SWPC aurora (OVATION-Prime) model:  
<http://www.swpc.noaa.gov/products/aurora-30-minute-forecast>

G1 Watch was in effect for both January 31st and February 1st, due to an influence associated with a CH HS. Meanwhile, Region 2733 produced a C5 flare at 0611 UTC, just before it began to rotate beyond the visible disk.

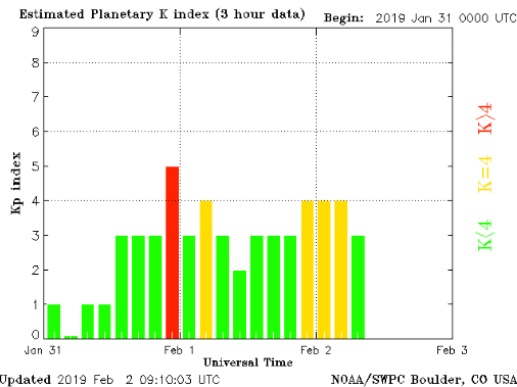
NOAA Space Weather - NWSSPC:



February 1st - A coronal hole stream above 500 km/s was moving past Earth. Minor (G1) geomagnetic storming was being detected. A watch for an isolated period of Moderate (G2) geomagnetic storming was in effect.



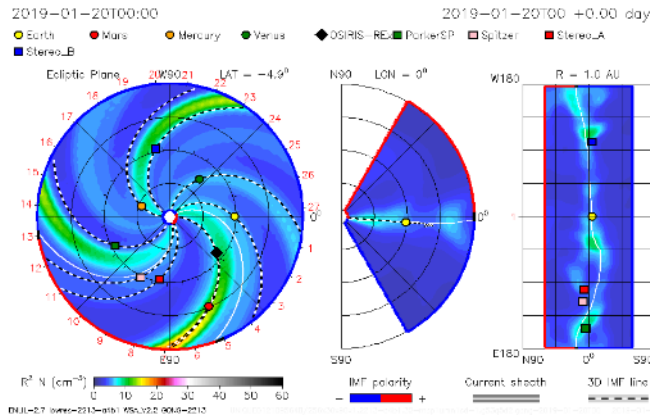
Earth was inside a stream of solar wind flowing from this wide coronal hole. Credit: SDO/AIA



February 3rd -

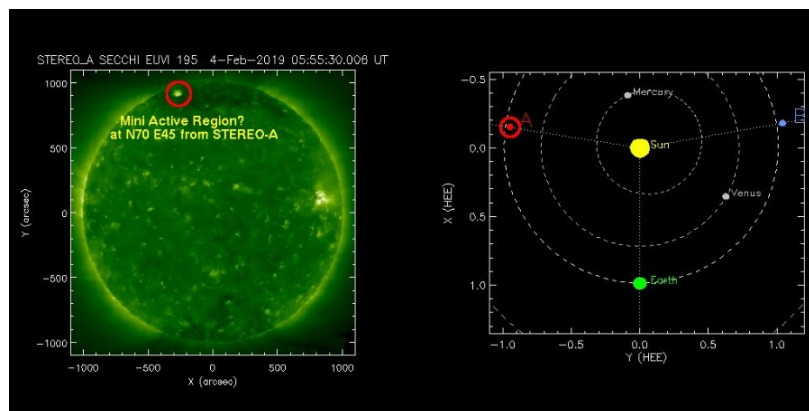


Active geomagnetic conditions (Kp4) Threshold Reached: 17:59 UTC

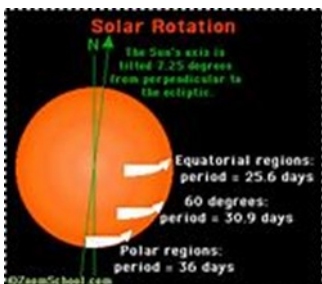


WSA-ENLIL Solar Wind Prediction Model: [swpc.noaa.gov/products/wsa-enlil-solar-wind-prediction](http://swpc.noaa.gov/products/wsa-enlil-solar-wind-prediction)

February 4th -



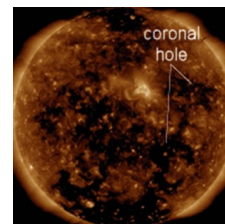
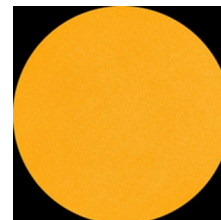
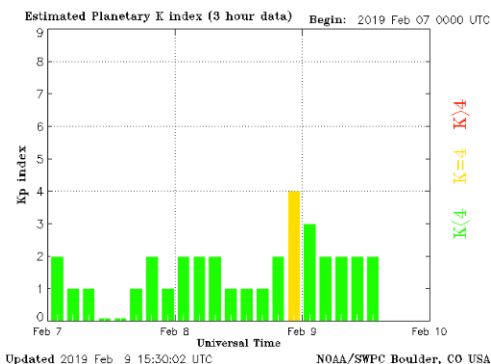
The Sun's northern polar region showed a big bright point (on the backside), maybe qualifying it as an active region. Was this an old or new cycle polarity region? No magneto-graph was available to verify this information.



The Sun's period of rotation at the surface varies from about 25 days at the equator to about 35 days at the poles.

February 7th - *Elevated Cosmic Rays*. This phase of the solar cycle brings higher levels of cosmic rays, and longer lasting holes in the Sun's atmosphere.

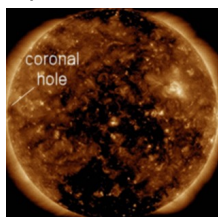
The Sun was blank - no sunspots. Credit: SDO/HMI.



[Yellow] Avg. SW Speed Is 350-400 Kilometers/Second  
 [Green] SW Temp Over 500,000K Is 'High'

Solar wind flowing from this southern coronal hole was forecast to reach Earth on February 9th. Credit: SDO/AIA.

February 10th - Geomagnetic unrest - A stream of solar wind was buffeting Earth's magnetic field, causing minor geomagnetic unrest. The gaseous material was flowing from a southern hole in the Sun's atmosphere. Earth was expected to remain inside the stream for another 24 hours with a slight chance of G1-class geomagnetic storms.



A large recurrent coronal hole was about to emerge over the Sun's Eastern limb. Credit: SDO/AIA.

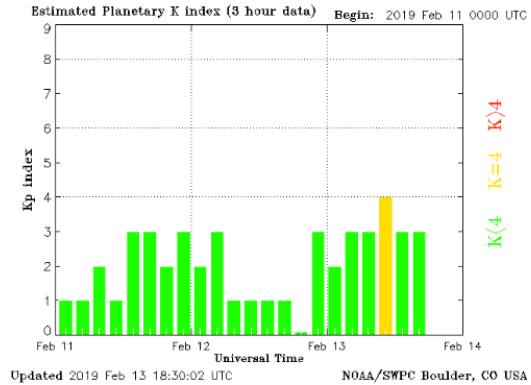
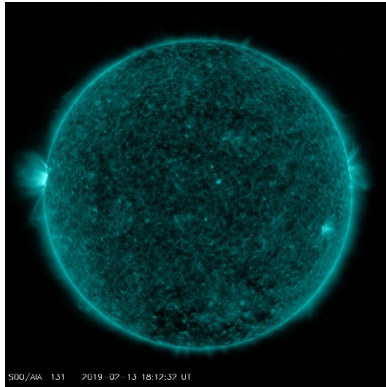
February 10th - All space weather was calm. Solar wind intensification was expected during the weekend but was not expected to be significant. No sunspots existed on the Earth-facing side of the Sun.

Long range forecast: Geomagnetic activity was expected to remain low for the following week as Earth passed through a "slow zone" between two streams of solar wind. G1-class geomagnetic storms were possible on February 19th when the solar wind speeds picked up again. The gaseous material was coming from a long-lasting hole in the Sun's atmosphere, forecast to return a week hence.

Solar-Terrestrial Data - <a href="http://www.n0nbh.com">http://www.n0nbh.com</a>			
11 Feb 2019 1207 GMT	VHF Conditions	HF Conditions	Condition
SFI 70 SN 0	Aurora Band Closed	80n-40n Fair Good	Quiet 0-2 0-7
A 6 K 1 / PIntry	6n EsEU Band Closed	30n-20n Fair Fair	Unsettled 3 8-15
X-Ray <A1.0	4n EsEU Band Closed	17n-15n Poor Poor	Active 4 16-29
304A 94.6 @ SEM	2n EsEU Band Closed	12n-10n Poor Poor	Minor storm 5 30-49
Ptn Flx 0.16	2n EsNA Band Closed	Geomag Field VR QUIET	Major storm 6 50-99
Elc Flx 515.00	EME Deg Fair	Sig Noise Lvl S0-S1	Severe storm 7-9 >100
Aurora /n=	MUF ES - SEASON BREAK	MUF US Boulder NoRpt	SFI A-In K-In Prop Opng
Aur Lat No Report	MS 0 6 12 18 UTC MAX	Solar Flare Prb 1%	>180 <8 <3 E-W open
Bz -1.1 Sw 416.3			>180 <8 >3 N-S open
			>250 >30 >3 Aurora

(For current Solar – Terrestrial Data, refer to the Denver Radio Club's website.)

February 13th - A returning bright region rotated back into view boosting amateur radio propagation on Earth's day-side. SDO / AIA 131



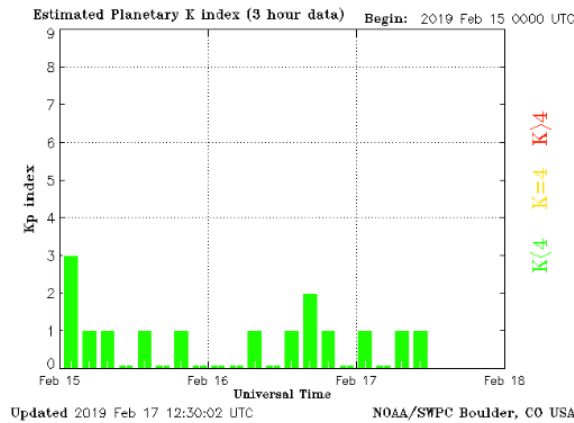
February 14th - New active region lacked sunspot umbra beneath the fields. Solar wind was slightly intensified, but with little geomagnetic effects.

February 16th - All space weather was quiet. Coronal hole solar wind was expected to arrive within 2-3 days providing an intensification to geomagnetic conditions.

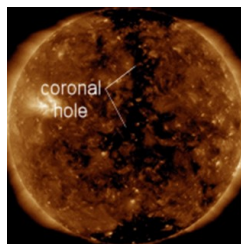
*Are We Entering a Maunder Minimum?*

The "prolonged sunspot minimum". The Maunder Minimum was the name used for the period around 1645 to 1715 during which sunspots became exceedingly rare, as was then, noted by solar observers.

February 17th - Quiet times on the Sun with nothing of interest to report. The visible disk had now been void of visible sunspots for over two weeks. Geomagnetic activity was also at quiet levels with no geomagnetic storming in the forecast. A small coronal hole would begin to face Earth on the weekend delivering an elevated solar wind stream past our planet.

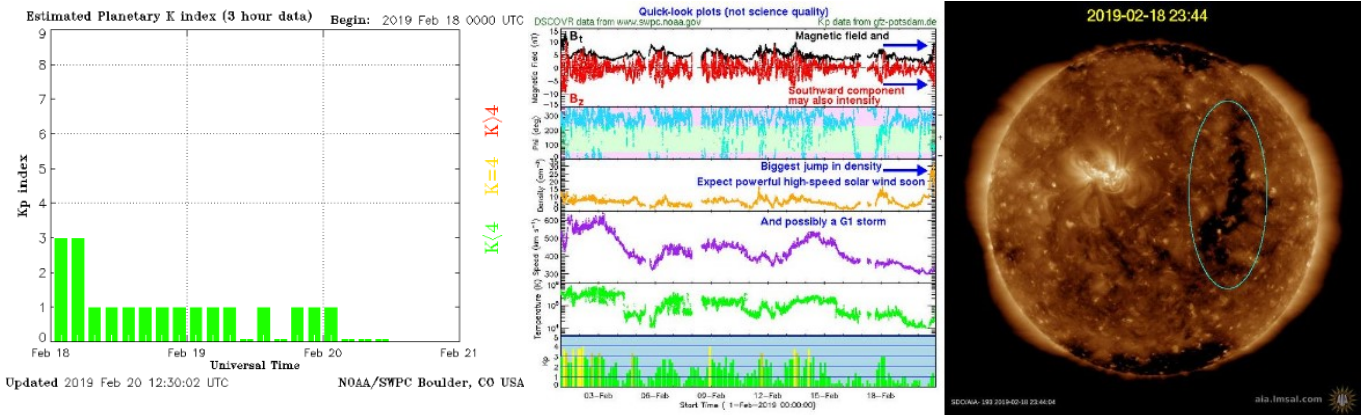


A canyon-shaped hole in the Sun's atmosphere was facing Earth and spewing solar wind in our direction. Estimated time of arrival: February 19th. G1- class geomagnetic storm levels expected. Credit: SDO/AIA.





February 19th - All space weather was quiet. Coronal hole solar wind was expected to arrive within 24hrs and provide a modest intensification to geomagnetic conditions.

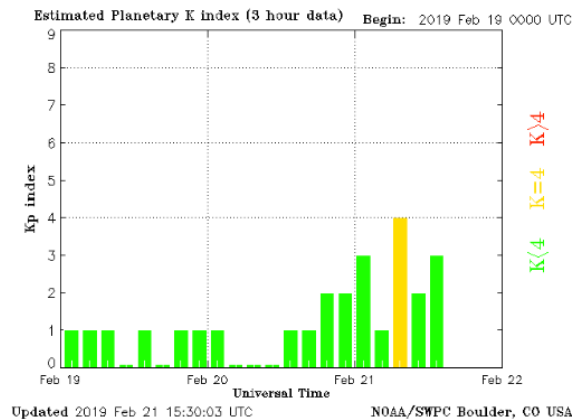


This month has been very quiet, only hitting Kp=4 (active condition). But upcoming HSS may bring at least G1 (Kp=5) storm on the basis of the strongest compression since February 1st.

February 21st - The solar wind arrived: Earth was entering a stream of solar wind flowing from a canyon-shaped hole in the Sun's atmosphere. Measurements from NASA's STEREO-A spacecraft suggest that wind speeds topped 500 km/s.

Summary:  
Prepared jointly by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center: Solar activity was very low with no numbered regions on the visible disk. No other CMEs were observed in available coronagraph imagery. The solar disk remained spotless.

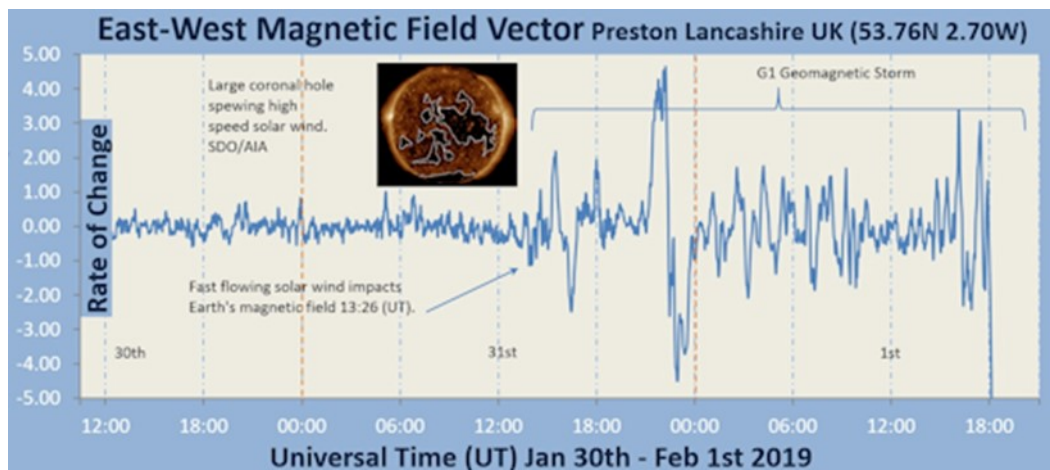
Forecast:  
Solar activity was expected to continue at very low levels.



Early prediction for cycle #25: The current trend for relatively low solar activity is predicted. Cornell University: <https://arxiv.org/abs/1902.05294>

What happens when a stream of solar wind traveling 1.3 million mph strikes Earth's magnetic field? The plot shows the change in magnetic flux density in nanotesla occurring between readings every few minutes.

73,  
Fred  
AA0JK



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## NASA TO TEST X-RAY COMMUNICATION SYSTEMS ON THE ISS

PROVIDED BY BILL HESTER, N0LAJ

NASA is in the midst of testing an X-ray communications system on the ISS. Lori Keesey, rapporteur at NASA's Goddard Spaceflight Center provided the latest news on February 20, 2019.

She explained how the scientists may be able to use X-rays to transmit data to the space station at around gigabit speeds. The full article can be found at: <https://www.nasa.gov/feature/goddard/2019/nasa-set-to-demonstrate-x-ray-communications-in-space>

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## US NAVY EXPLORES AMATEUR RADIO AS A TRAINING ADJUNCT

BY FRED HART, AA0JK

In days past, the radio amateur experimenter / operator, was looked upon as a knowledgeable technician. Someone who could enter a job position and have the fundamentals to get a job done. "You have an amateur radio license, you're hired". You just went to the front of the line on a technical career-path.



Since the advent of, "Just memorize the answers", the amateur radio licensee lost that prestige. Here's the opportunity to gain that prestige back.

Don't just memorize test questions to pass that test. Know and be able to apply that knowledge, and maybe the world of technology will come looking for you. The US Navy recognizes the benefit of an Amateur Radio license.

What's this? The US Navy's Naval Air Warfare Center Weapons Division (NAWCWD) has adopted Amateur Radio training as a possible new approach to basic RF and electronics instruction.

The military is looking to the amateur radio community for knowledgeable candidates to fill needed high-tech jobs. This could be a great beginning for future training, and a life long career, in or out of the military arena. What do you have in your wallet? That license could mean the beginning of a great future, if you understand the technology put forth in getting that license. Go to the head of the line.

The ARRL's 2/13/2019 post can be found at: <http://www.arrl.org/news/view/us-navy-explores-amateur-radio-as-a-training-adjunct>

P. S. - First hand experience, that Amateur Radio license opened doors that would have otherwise not been recognized.

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).

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## WHERE DOES 468 COME FROM?

SUBMITTED BY BILL RINKER, W6OAV  
FROM ROCKWELL COLLINS "SIGNALS" BY WARD SILVER, N0AX

We've all seen this number over and over again – the “magic number” that gives us the length of a half-wavelength dipole in feet from the dipole's resonant frequency:  $L = 468/f$ . In free-space the wavelength in feet is  $492/f$ , but a practical halfwave length antenna is shorter so the constant is smaller. The number 468 is on the license exams and in the literature. It's been there ever since I started reading about ham radio in the mid 1960s. It's a pillar of amateur antenna theory. Every ham is expected to memorize it. And it's wrong.

It would be more accurate to say that it's rarely correct. There are certain instances where it's close, but using it often leads to wasted wire. The usual instructions to a new ham are, “Calculate how much wire you need using  $468/f$  and then add a couple of feet.” What that really means is the value 468 is too small and we compensate for the error by “adding a couple of feet”. If 468 isn't right, why do we use it? Answering that question requires a trip along the paths of history.

Recently, I had the opportunity to spend a few days at ARRL Headquarters to plan upcoming writing and editing projects. The ARRL has a great Technical Library with every edition of ARRL publications and technical publications going back decades. (If you ever get close to Connecticut, it's well worth dropping in on the ARRL for a tour!) I had some time one afternoon and decided to find out when and how the number 468 first appeared in the ham literature.

My first stop was the ARRL Antenna Book's initial edition in 1939. Sure enough, on page 13 in the chapter on “Antenna Properties”, the familiar formula  $468/f$  appears. The Antenna Book states that the “end effect” due to the attachment of insulators at the ends of the antenna results in the approximately 5% reduction in length from the free-space  $492/f$  to  $468/f$ . The text goes on to state that the percentage “varies slightly with different installations”, but doesn't say how, nor is a citation provided to identify how the value of 468 was obtained.

Since it is unlikely that the value of 468 appeared in the Antenna Book without any “prior art”, I next turned to the ARRL Handbook's first edition in 1926. That turned out to be a dry hole – no formula for antenna length and nothing in 1927 or 1928 either. Then, in the 1929 edition's “Antennas” chapter on page 128, I hit pay dirt! The text defines natural wavelength as the highest wavelength (the lowest frequency) at which the Hertz antenna (a halfwave length dipole) will resonate. It is stated that “The natural wavelength of the wire...will be its length in meters multiplied by 2.1” Hmmm...2.1 is 5% longer than would be the free-space value of 2. (Remember, the text is discussing wavelength, not frequency.) Farther down the page I saw, “Speaking in terms of feet, the natural wavelength of the antenna will be its length in feet divided by 1.56.” That equation translates to  $L = (300 \times 1.56)/f$  and  $300 \times 1.56$  is 468! Here were the headwaters of the mighty River 468!

Still, no background for the correction was given. Where does the use of a correction factor originate? Back to the stacks! Did I really want to go through all of the QST magazines until I found my answer? Well, not really, but inspiration struck in the form of the online QST archives. I logged into the ARRL Web site, brought up the QST archive search page, and...hit another roadblock. I couldn't very well search for “468” because it was unlikely to be a keyword. “Dipole” would return hundreds of hits. Then I realized that in the early days, a half-wavelength dipole would have been referred to as a “Hertz antenna” or “Hertzian antenna”. I entered the former and scrolled down to the very earliest entries. The oldest article on Hertz antennas was in the July 1925 issue by 9BXQ and titled “The Hertz Antenna at 20 and 40 Meters” but it didn't discuss a formula for length. The next oldest article, October 1926's “The Length of the Hertz Antenna” by G. William Lang, turned out to be what I was looking for. In the article, Lang (who was apparently not a ham, but worked in the Dept of Radio Operations for Radio Station WBZ in Boston) set up some Hertz antennas at amateur station 1KA and also measured antennas at station

1CK and 1KF. He used an oscillator and a wavemeter to determine the frequency at which the antenna resonated then measured the entire antenna - tip-to-tip, including the counterpoise. A table of correction values was derived, with the free space wavelength in meters multiplied by an average value of 1.46 to get the antenna's resonant wavelength in feet. This corresponds to an equation of  $L = 438/f$ . This is the first suggestion that the actual resonant length of a practical amateur antenna can be predicted by using a correction factor to a free-space wavelength.

The early experiments of 1925 and 1926 took place on or near 40 meters. In those days, CW operation on what we now call the "low bands" of 80 and 40 meters was the norm. At these wavelengths, a half-wavelength dipole was of a reasonable length. It could be made of ordinary copper wire, probably #8 to #14 AWG, and installed in the back yard at heights of 20 to 40 feet. For these antennas, 1/8th to 1/4th wavelengths above ground, a value of 468 is about right, resulting in the equation printed in the ARRL Handbook in 1929.

In truth, many variables affect the resonant frequency of a halfwave length dipole, the two primary factors being the length-to diameter ratio of the antenna conductor and most strongly, the antenna's height above ground. These can combine to change the actual correction factor quite a bit! (Insulation can also affect an antenna's electrical length.) In my November 2009 QST column, "Hands-On Radio: Antenna Height", I modeled a typical 20 meter dipole made of #12 AWG un-insulated wire at heights from 1/8th to 2 wavelengths over realistic ground and calculated the correction factor at each height. It varied from 466 to 481 over that range! Clearly, using 468/f would lead to an antenna being too short most of the time.

If 468 is too small and rarely correct, what should you do? Realistically, you should expect to trim your dipole to get the resonant frequency you want. Instead of being frustrated that the calculations aren't exact, learn to adjust the antenna's length efficiently by using an instrument such as an antenna analyzer. Start with an estimated value based on a more realistic formula such as  $490/f$  that results in a small amount of extra wire for attaching insulators. During tuning, twist the wire connections together or use clamps, then raise the antenna into position and measure. When it's right, only then solder and weatherproof the connections. Recognize that every antenna's circumstances are slightly different – height, ground conductivity, thickness of wire, nearby conductors, and so forth.

Another lesson to learn from this exploration is to realize that "magic numbers" in formulas have often been determined through experimentation under specific circumstances. As such, they likely depend on a variety of factors that you may not be able to replicate. They will only approximate what you actually encounter. If the assumptions behind the value are given – you can use that information by comparing it to your situation. If the assumptions are not known – you should allow for variations or try to find a more accurate model representative of your own circumstances.

I hope you've enjoyed reading about this journey as much as I enjoyed taking it, opening the covers of books nearly 80 years old and mapping the stream of knowledge back to its sources - finding there the foot prints of wireless pioneers that set ham radio on the course we travel today. (Reprint courtesy eHam.net)

**WHAT IF THE WEATHER CHANGES?**

*If we should experience a turn in the weather on the day of our monthly DRC meeting it may be necessary to cancel the meeting. If this should happen listen for meeting status reports on 145.49 or 448.625 MHz repeaters during the afternoon on the day of the meeting.*



**FACT OF THE DAY**

**NE-2 Lightning Protection**

Sometimes NE-2 neon lamps are used on receiving antennas to provide protection from transient voltages induced by lightning. There are several problems with that. One is the high firing potentials of typical NE-2 lamps. Individual lamp firing potentials vary, but they generally fire at about 90 VDC or 65 VAC. That is a lot of voltage to apply to the input of a sensitive RF amplifier designed to amplify signals in the microvolt range. Current-carrying capacity is another problem. Lightning induced voltages are commonly high enough to flash across any current-limiting series resistor, causing lamp current to greatly exceed NE-2 ratings. Even if the current doesn't cause a lamp to explode or show visible signs of damage, internal sputtering will remove rare-earth coating from the electrodes. That will increase both the DC and AC firing potentials and cause the lamp to provide even less protection next time.

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**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**

**HAM SITE OF THE MONTH**

[AmateurLogic](http://AmateurLogic)

**THE ROUNDTABLE ARCHIVE**

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

**THE ROUNDTABLE ARTICLE INDEX**

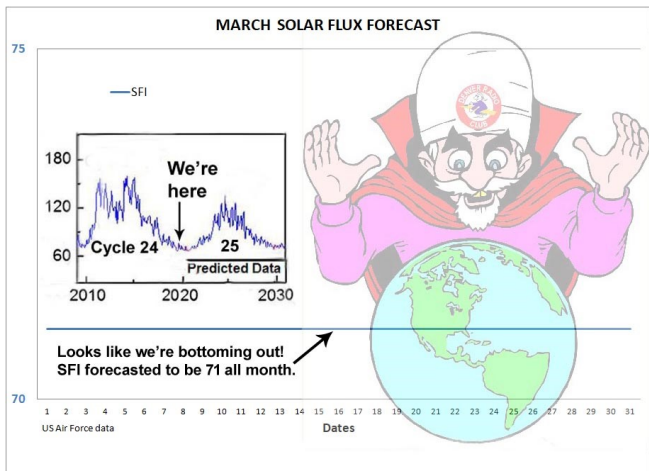
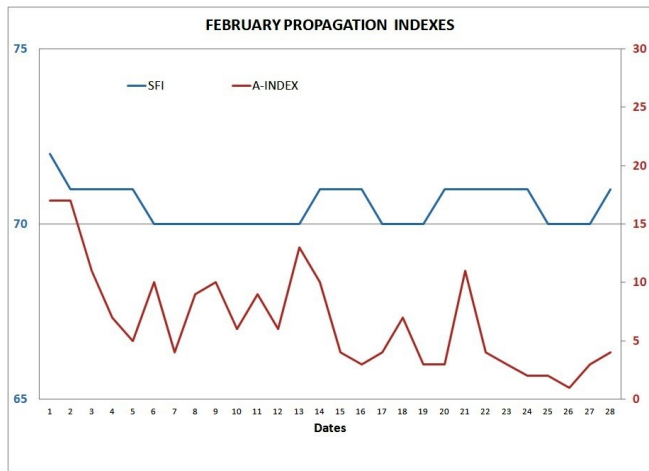
Go to: <http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf>

## 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 *Roundtable* 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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LARCFest 2019	04/06/19	Boulder County Fairgrounds	<a href="#">Longmont ARC</a>
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**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
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Idaho	03/09/2019	03/10/2019	<a href="#">Idaho QSO Party</a>	
Oklahoma	03/09/2019	03/10/2019	<a href="#">Oklahoma DX Association</a>	
Wisconsin	03/10/2019	03/11/2019	<a href="#">West Allis Radio Amateur Club</a>	
Louisiana	03/16/2019	03/17/2019	<a href="#">Louisiana Contest Club</a>	
Virginia	03/16/2019	03/17/2019	<a href="#">Virginia QSO Party</a>	
Mississippi	04/06/2019	04/07/2019	<a href="#">ARRL Mississippi Section</a>	
Missouri	04/06/2019	04/07/2019	<a href="#">Boeing Employees' Amateur Radio Society – St. Louis</a>	
Georgia	04/13/2019	04/14/2019	<a href="#">Georgia QSO Party</a>	
New Mexico	04/13/2019	04/14/2019	<a href="#">Valencia County Amateur Radio Association</a>	



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**DRC REPEATERS**

BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090MHz (-1MHz) 107.2Hz PL	
Packet	145.05MHz<>14.105MHz	2 meter / 20 meter gateway. Useable by Technicians on 2 meters. See January 2015 RT.
2m	145.490MHz (-) 100Hz PL	Linked to the 70cm / 448.625MHz machine.
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 the 2m / 145.490MHz machine.
70cm	449.350MHz (-) 100Hz PL	Wide area coverage with Echolink, node # 4140.
70cm	449.775 MHz (-) 100Hz PL	Yaesu Fusion Digital, Wires-X and analog. 100 Hz tone required for analog.
70cm	446.7875MHz (-)	BrandMeister Repeater: Slot 1 – Wide Area Traffic, Slot 2 – Local Talk Group 310804



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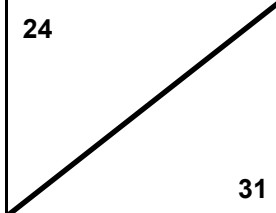

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<b>MARCH 2019</b>							<i>DRC Net Sundays at 8:30 p.m. on 145.490 / 448.625 (no PL)</i>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
					1	2 ARRL DX - Phone Begins 0000 UTC	
3 ARRL DX - Phone Ends 2359 UTC	4	5	6 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)  New Moon	7	8	9	
10 	11	12	13 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	14  First Quarter	15	16	
17 	18	19	20 DRC Meeting Elmer 6 p.m. General 7 p.m.  Full Moon	21	22	23	
24  31	25	26	27 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)  Last Quarter	28	29	30	



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**Please Let Us Know**

Over the years we occasionally hear from hams who have read the RoundTable 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 RoundTable RoundWorld.

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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