



ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917

February 2018

PRESIDENT'S MESSAGE

BY GERRY VILLHAUER, W0GV

Hello DRC Members,

I hope you all are avoiding the flu that is going around. It is probably a good idea to avoid crowds and airplanes if possible. I really do not have a lot of news to pass on this month. One thing that comes to mind is our Fusion Wires-X repeater, it has developed a problem. The power output is way down; we are thinking we have a power amp failure. We have plans to go trouble shoot it soon. If you are a Fusion user and you find the repeater off the air, you will know why.

Thanks to Paul Deeth (WA2YZT) for the last month's program on what goes on behind the scene at CBS Channel 4 to get the news and other programming to you, the viewer. Paul's experiences and stories are always very entertaining and informative.

Our February program will be presented by George Palecek, (AB0YM). George will be telling us all about Roving during the VHF contests. He will be telling us what is roving? What equipment is required and how to be a successful roving station. I am not a contester but, I have participated in some VHF contests as a rover and I can tell you, it is a blast! I am sure you will find his presentation very interesting and informative and hopefully encourage you to give roving a try.

Don't forget to check the DRC website from time to time for new information. Presently we have all the information posted for our August DRC Hamfest including a printable flyer and table reservation form. It's better reserve a table earlier than later; check it out.

A note for you calendar. I know it is a ways off but, our DRC Christmas/Holiday Party for this year will be on a different date than usual. Mark you calendars for December 5th, 2018.

Thanks to our new members for making the DRC "Your Club." Please come to meetings and other events and stay active. Your name and call will be listed in this issue of the Round Table.

73 for now,

Gerry (W0GV)
President



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JANUARY MEETING – WHAT'D I MISS?

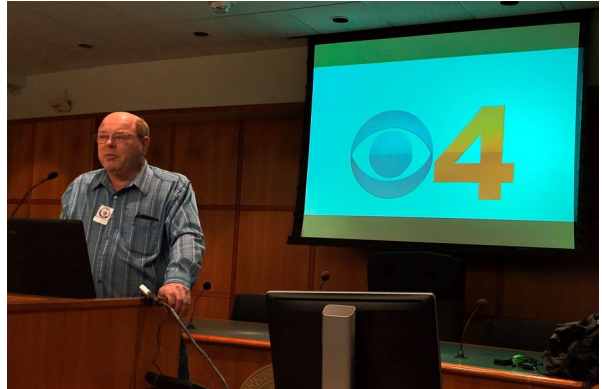
BY BILL RINKER, W6OAV

The meeting was well attended with quite a few visitors. After introductions, Gerry (W0GV), turned the meeting over to our guest speaker, Paul Deeth (WA2YZT). Paul is a DRC member and a Broadcast Engineer with KCNC-TV. Paul's very interesting presentation titled "Every Day in TV Production is Field Day" demonstrated what it takes to get the news stories from the actual locations into the viewers' homes.

Paul started with an overview of the changes that have taken place with the technologies evolving from analog to digital. He then presented a visual tour of the insides and outsides of a satellite truck, a mobile command and control truck and other support vehicles. He also visually described the various types of microwave systems and the mass amounts of power cables, control cables and coaxes required.

Paul then described the work that was necessary to setup equipment at various major events such as the Democratic National convention, Obama's acceptance speech at Mile High stadium, the Republican debate in Boulder, the Aurora shooter's trial in Aurora, and many more events. Paul had several interesting stories of various mishaps, some of which were pretty funny.

The presentation ended with many interesting questions.



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:

Richard Walker - KF5LDS | Bob Proctor - W0CR | Jack Harper - W0YJ

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

The following is an overview of the subjects discussed at the January Technical Committee meeting.

DRC/TSA Aurora Site

Goal: Maintain contact with TSA relative to establishing a “communications room” for the DRC.

Status: WW0LF has sent a letter to the TSA describing the services that the DRC can provide and recommendations for the communications equipment and antennas. The TSA representative has recently contacted W0GV and is planning to meet with us soon.

Station 4 Remote Power Control

Goal: Install Internet controlled power outlets.

Status: W0N has installed an Internet controlled outlet power strip at Station 4. As soon as the WiFi is switched to a new more reliable system, the outlets will be reconfigured. Designated tech committee members will be provided an app which will allow internet control of the outlets.

Centennial Cone Remote Power Control

Goal: Document equipment to be controlled by the Internet controlled power outlets. Install the outlets.

Status: Outlets will be installed this spring when other projects are completed there.

Fusion Repeater WIRES Interface

Goal: Resolve the intermittency of the WIRES interface with the Internet.

Status: The WiFi serving the repeater has issues. A new WiFi system is now available and the repeater will be switched to it ASAP. The performance of the WIRES interface will then be monitored to determine if any other repeater problems exist.

Fusion Repeater Move

Goal: Discuss the feasibility of moving the Fusion repeater to a better coverage location.

Status: Once the reliability of the repeater is established, it will be moved to Centennial Cone.

Fusion Repeater WIRES Interface Training

Goal: Train several club members how to program and maintain the Fusion Repeater system.

Status: Training will take place after the repeater operation is stable.

BrandMeister Repeater Operating Procedures

Goal: Develop operating procedures and post on website.

Status: W6OAV will develop the procedures ASAP.

FEBRUARY MEETING PRESENTATION

By GEORGE PALECEK, ABOYM

Getting Started in Roving in VHF Contests

Roving is an interesting way to participate in the various VHF contests. What is roving? Does it require expensive equipment? (Not necessarily!) This presentation will be an overview of what it takes to be a successful rover, rule differences, route and operating strategies, and equipment ideas. Transceivers, antenna configurations, and vehicle power connections will be covered.

George Palecek’s Bio:

George Palecek of Littleton, CO is a semi-retired IT administrator. Most recently, he was a Lead Oracle Database administrator at a major telecommunications company. He has also managed an IT department, developed software and worked as an Industrial Engineer doing operations research

Mr. Palecek holds a Master of Computer Information Systems from the University of Denver. He has taught as a member of the adjunct faculty at the University of Denver and Arapahoe community college.

He was first licensed in 1969 as WA0YHH and held that call for ten years. In 2003 he re-entered the ham world as ABOYM. He can mostly be found using digital modes on the HF bands and SSB during VHF contests as a rover. ABOYM holds the Rocky Mountain Division current record for the Rover Limited class in the ARRL January VHF contest.



DRC's 100TH ANNIVERSARY PINS

BY W0TX STORE

If you would like to commemorate the 100th year of the Denver Radio Club then ask about getting your very own commemorative pin. The cost is \$3 for one or two for \$5. They are available at the monthly face-to-face. Please talk to Gerry, W0GV. They are about 1" tall and 0.75" wide.



LEARNING NET REPORT

BY FRED HART, AA0JK

Thanks goes out to our net controllers: Larry (K0LAI), Alex (KS0E) and Steve (KD0WMO). The following topics were discussed this past month:

RFI six meter transmissions getting into house hold appliances. Problem discussed and problem eliminated via simple inexpensive technique: [ARRL Handbook 2018](#), 27.7 Elements of RFI Control, page 27 - 29. Also, the [ARRL RFI Book 3rd Edition, Item No. 0915](#).

Grounding and Lightning Protection: Making reference to rules as defined by the NEC before making any wiring installations. This from Dave, AA0DH. Thanks Dave.

Solar cycle future band conditions.

NCVEC Releases New Technician License Question Pool into the Public Domain.

Static discharge damage to Yaesu FT-897D. Discussion on how to avoid such damage to your equipment.

Satellite antennas commercially produced and home-brew. K7AGE Randy <https://youtu.be/6A9ZrHNkG9E>

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. 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 Coordinators: Mike Vespoli (KE0HFH) or Brennan Pate (AD0UZ), at emcomm@w0tx.org.

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 or 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. 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 / 448.625.

(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

ELMER SESSION START TIME

The Elmer Session Starts at 6 p.m. before the regular 3rd Wednesday DRC Meeting! All are welcome. Meet in Hearing Room # 2.

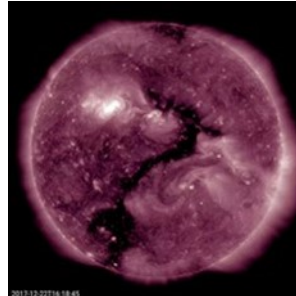
Come join in on the sharing of information.

SOLAR UPDATE

PROVIDED BY Fred Hart, AA0JK

Solar Geophysical Activity Report for January 2018

A New Year is upon us. What can we expect from our star?



Credit: SDO / NASA

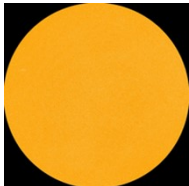
An elongated coronal hole (the darker area near the center) seems to have shaped itself into a single, recognizable question mark. Coronal holes are areas of open magnetic fields that appear darker in extreme ultraviolet light.

These holes are the source of streaming plasma that we call solar wind. While this exercise is akin to seeing shapes in our clouds, it is fun to consider what the sun might be asking? Perhaps. What will the New Year bring? OR, guess what I am going to do next? Credit: Solar Dynamics Observatory, NASA.

https://sdo.gsfc.nasa.gov/assets/gallery/movies/Question_mark_big.mp4

December 2017 left us with minor (G1) geomagnetic storm watches that were in effect as we prepared to ring in the New Year 2018. A coronal hole stream was expected to reach Earth during the following 24-48 hour period. December 31, 2017 @ 00:45 UTC

Week One:

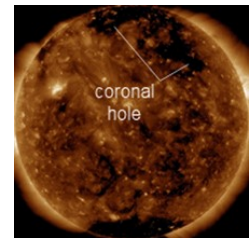


Credit: SDO / HMI

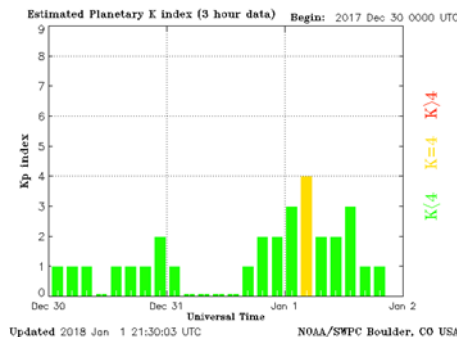
January 1st - CHANCE OF STORMS: NOAA forecasters said there was a 50% chance of minor G1-class geomagnetic storms as Earth moved into a stream of solar wind.

The Sun was blank; no sunspots.

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

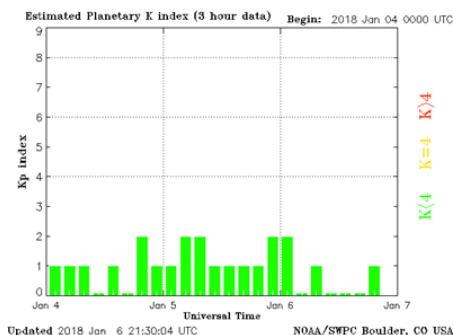


Credit: SDO / AIA



January 3rd - A quiet start, and you can expect many more quiet days ahead as we continue on towards solar minimum. There were no visible Earth facing sunspots and geomagnetic activity was stable.

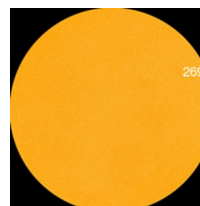
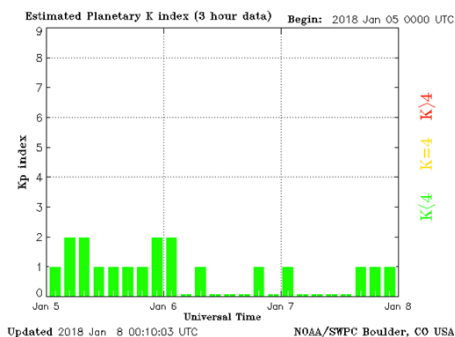
A small prominence rose up above the sun, appeared to twist around for several hours, and then began to send some streams of plasma back into the sun (Jan. 3-4, 2018). The action, observed in a wavelength of extreme ultraviolet light, lasted just about one day. Prominence's like this one are quite common. In fact, there were several over the previous days. For a sense of scale, the prominence reached up more than several times the size of Earth. Credit: Solar Dynamics Observatory, NASA.



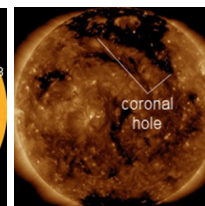
January 6th - During week one of January, the sun had remained quiet. This is normal for solar activity as it approaches solar minimum. Coronal holes shrink and retreat to the Sun's polar regions and sunspots fade away completely. Noteworthy with this cycle is that the Sun seems to be racing towards solar minimum quite quickly. Data figures were portraying that this minimum cycle may come and go faster than predicted.

Week Two:

During the first week of 2018, hardly any CMEs were seen. No eruptions anywhere on the Sun that could disturb the heliosphere. Also, no GOES events above B level. We may already be in solar minimum. Can we predict when this may (or may not) end?



Credit: SDO / HMI



Coronal Holes Jan 7th
Credit: SDO / AIA

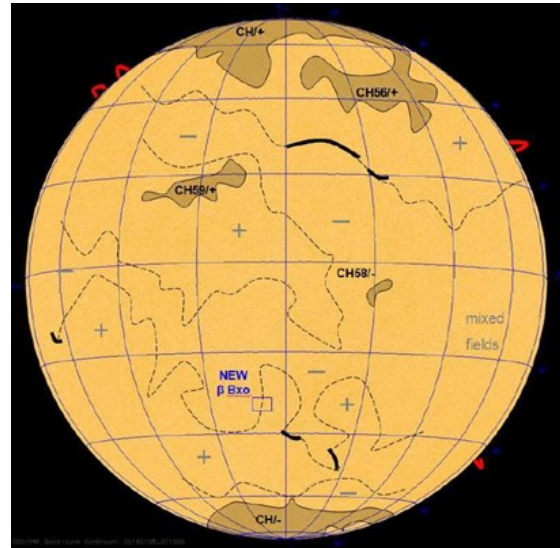
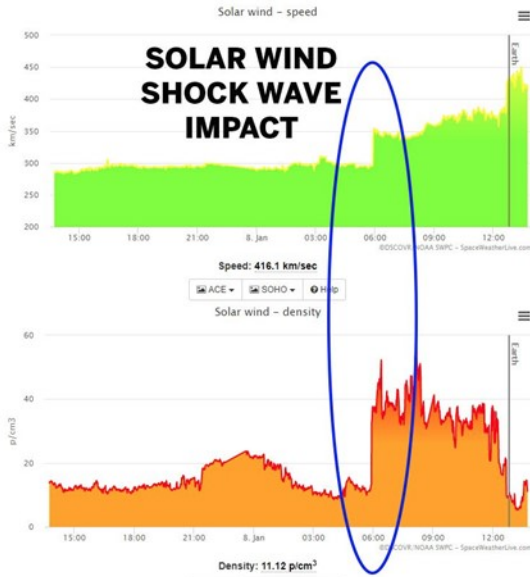
Solar wind flowing from this northern coronal hole was expected to reach Earth on January 8th.

January 7th - Sunspot AR2693 was small and posed no threat for strong solar flares.

GEOMAGNETIC UNREST EXPECTED: A stream of solar wind was expected to reach Earth on January 8th, passing mainly north of our planet's magnetic field. The grazing encounter could spark auroras around the Arctic Circle, albeit not a full-fledged geomagnetic storm. The gaseous material was flowing from a northern hole in the sun's atmosphere.

January 8th - A minor solar wind shock wave arrived at Earth Monday morning around 0600 UTC. Origin of the shock was unknown. Could have been a stealth CME. The Bz then turned southward and active conditions (Kp4) were predicted to be possible later in the day. Impact was due to a slow solar wind moving at ~350km/s, but was showing signs of a second wave moving at ~420 km/s and Bz<-10 nt.

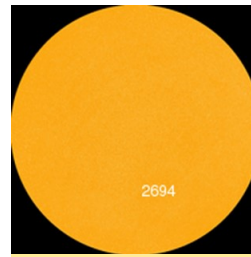
Solar activity was expected to remain very low throughout the following 4 days with no significant sunspots on the visible disc, or expected to rotate around the eastern limb.



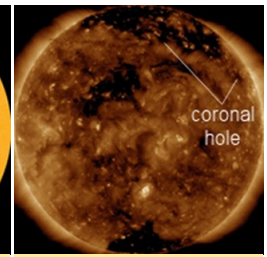
January 9th - Earth was inside a stream of solar wind flowing from this northern coronal hole.

GEOMAGNETIC UNREST: Earth was inside a stream of solar wind blowing faster than 500 km/s (1.1 million mph). The solar wind was flowing from a northern hole in the sun's atmosphere in a fan-shaped spray. The grazing action of the stream caused magnetic unrest around Earth's magnetic poles.

January 9th - New sunspot AR2694 was tiny and poses no threat for solar flares.



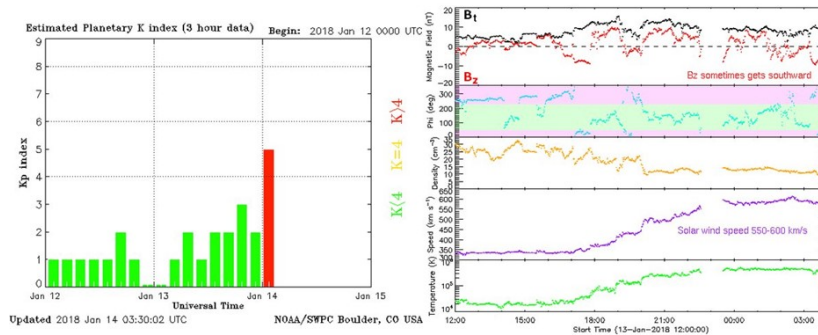
Credit: SDO / HMI



Coronal Holes Jan 9th
Credit: SDO / AIA

Week Three:

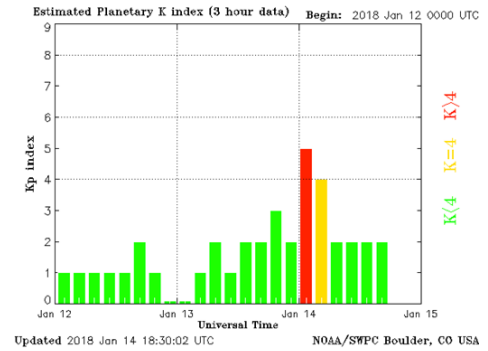
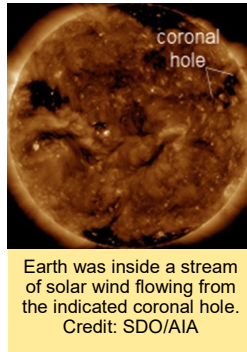
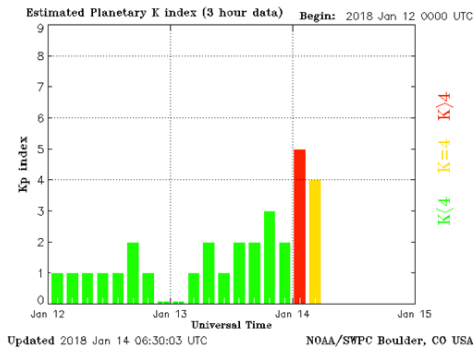
Surprise, A G1 (Kp=5) storm. 8:21 PM, 13 Jan 2018.



Minor G1 geomagnetic storm (Kp5) Threshold Reached: 02:59 UTC. SPACE WEATHER PREDICTION CENTER NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

G1 (MINOR) GEOMAGNETIC STORM ALERT WAS ISSUED Sunday, January 14, 2018 03:17 UTC. A G1 (Minor) geomagnetic storm alert was issued at 14/0259 UTC due to the onset of effects from an isolated, positive polarity coronal hole high-speed stream. A G1 (Minor) geomagnetic storm warning was in effect until 14/0900 UTC.

The gaseous material was flowing almost 600 km/s (1.3 million mph) as Earth moved deeper into the stream of solar wind.



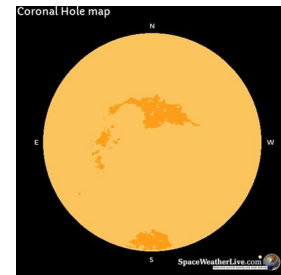
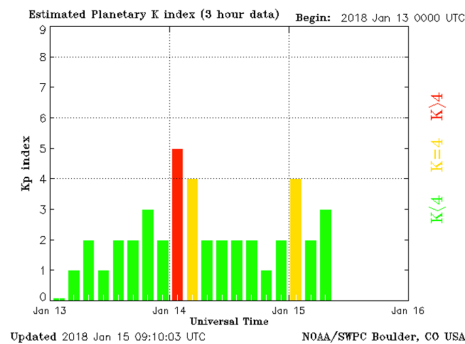
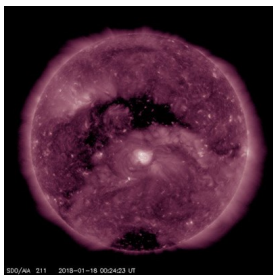
CO-ROTATING INTERACTION REGION: A solar wind stream engulfed Earth on January 14th. Just before it arrived, a CIR (co-rotating interaction region) hit our planet's magnetic field.

The next geomagnetic storm was expected on January 19th . It was expected to cause a G1- class geomagnetic storm when it arrived.

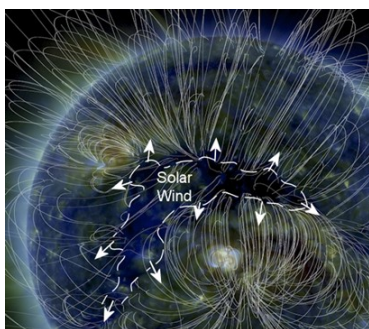
Co-rotating interaction regions are transition zones between slow and fast-moving streams of solar wind. Shock-like density gradients and enhanced magnetic fields inside CIRs can mimic the effect of CMEs (coronal mass ejections), sparking geomagnetic storms and reek havoc with HF communications when they interact with Earth's magnetic field. In this case, the geomagnetic storm ranked G-1 on NOAA scales.

Tiny sunspot AR 12696 emerged, but it had already started to decay. Also, the coronal hole that was facing us contained a lot of bright points (bipolar fields), but was not producing any fast solar wind.

January 17th - A northern hemisphere coronal hole was facing Earth. Enhanced solar wind was expected to arrive in ~3 days.



January 18th - A HOLE IN THE SUN'S ATMOSPHERE: Polar geomagnetic storms were possible when this stream of fast-moving solar wind was expected to hit Earth's magnetic field. The gaseous material was flowing from a crescent-shaped hole in the sun's atmosphere, shown here in an image based on data from NASA's Solar Dynamics Observatory:



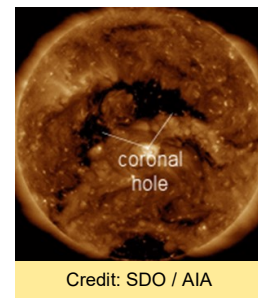
This is a "coronal hole," a region where the sun's magnetic field opens up and allows solar wind to escape. NASA's STEREO-A spacecraft had sampled the solar wind stream and measured its velocity: ~575 km/s (1.3 million mph). NOAA forecasters said there was a 45% chance of G1-class geomagnetic storms when the stream was expected to arrive on January 20th.

This stream was probably preceded by a CIR (co-rotating interaction region). CIRs are transition zones between slow- and fast-moving solar wind. They contain shock-like density gradients and enhanced magnetic fields that often do a good job of disrupting HF communications when they reach Earth's ionosphere.

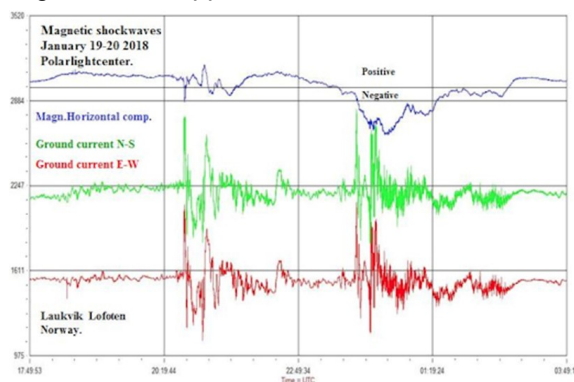
Earth would be immersed in a high-speed stream (HSS) from this extended coronal holes (negative polarity) for a few days.

Week Four:

January 21st - ENTERING THE SOLAR WIND STREAM: As predicted, Earth was entering a stream of fast-moving solar wind. The gaseous material was flowing from a crescent-shaped hole in the sun's atmosphere, and it had the potential to spark G1-class geomagnetic storms during the following 24 hours.



The strange thing about this was its timing. The solar wind stream hadn't yet arrived when polar activity erupted. Solar wind speeds wouldn't begin to increase until hours later after the outburst. What happened? A magnetometer operated by Rob Stammes at the Polarlightcenter in Norway may provide an answer. "My instruments recorded a double magnetic shock-wave," he said. "With each pulse of magnetism, electric currents flowed through the ground outside our observatory, bright auroras appeared overhead."



"These signatures are normally associated with CMEs (big explosions on the sun), not solar wind streams flowing from coronal holes," notes Stammes, who has been monitoring magnetic activity in Arctic Norway for decades.

The pulses Stammes recorded may have been delivered by a co-rotating interaction region (CIR). CIRs are transition zones between slow- and fast-moving regions of solar wind, often traveling just ahead of solar wind streams. They contain shock-like density gradients and enhanced magnetic fields that can sometimes mimic the effect of more powerful CMEs.

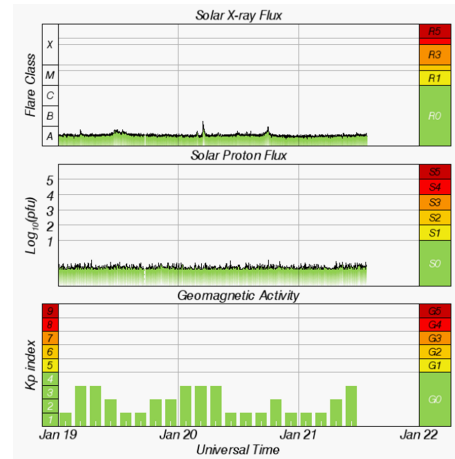
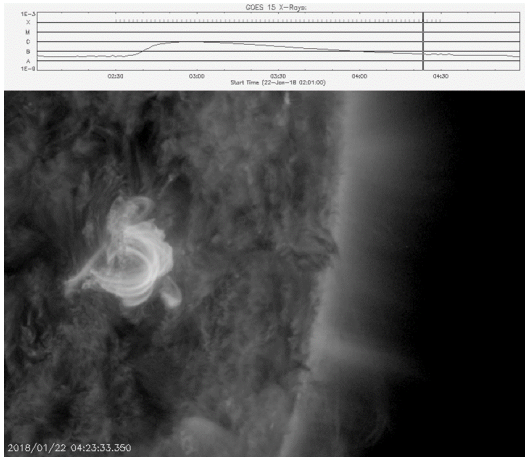
Tamitha Skov: *We were slowly ramping up the solar wind speed, but mainly we had been skirting the edges of the fast flow. That was expected to change pretty quickly!* Huge Coronal Hole Snakes Across Our Sun: Solar Storm Forecast January 21st: <https://youtu.be/VQ2CpsQUNEO>

Amateur radio operators were hanging on to marginal radio propagation, but this was degrading to poor conditions as we continued into a spotless Sun.

This week the Sun continued to tease us with short bursts of fast solar wind prior to hitting us with the real thing. Its one of the problems with the irregular shape of coronal holes. Especially when they look like a snake slithering diagonally across the Sun. It makes it extremely difficult to gauge exactly when the band of fast wind will enter the Earths-strike zone. As it was, we had gotten a few peeks of fast solar wind and were expecting the speeds to ramp up slowly. This had gotten NOAA/SWPC to downgrade the intensity of the oncoming storm, as it was not expected to slam into the Earth with a sudden jolt, rather a slow glide into our oncoming path.

January 22nd - SOLAR FLARE AND CME: Magnetic fields threading the remains of decaying sunspot AR2696 erupted on January 22nd at approximately 0300 UT. The explosion produced a minor B9-class solar flare and hurled a coronal mass ejection (CME) into space. Because of the blast site's location near the sun's western limb, the CME was unlikely to hit Earth. Nevertheless, NOAA analysts were modeling the CME's trajectory to rule out an impact.

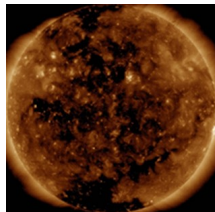
For the second day in a row, a stream of solar wind was blowing around Earth faster than 500 km/s (1.1 million mph), lighting up the night sky around the Arctic Circle.



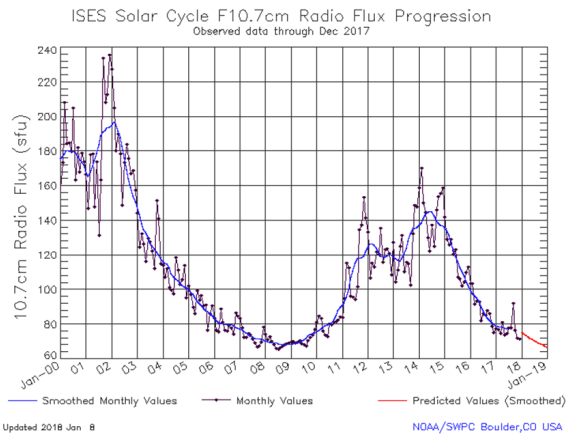
URL: <http://www.lmsal.com/solarsoft/archive/sdo/media>

January 25th - The sun was blank; no sunspots.

The sun will be spotless at least 50% of the time in 2018 as the solar cycle plunges toward a deep minimum expected in 2019-2020.



There were no large coronal holes on the Earth-facing side of the Sun. Credit: SDO/AIA



Forecast:

3-Day Forecast Issued 2018 January 26 0030 UTC.

Prepared by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center: *NOAA Geomagnetic Activity Observation and Forecast*: No G1 (Minor) or greater geomagnetic storms were expected. No significant transient or recurrent solar wind features were forecast.

NOAA Radio Blackout Activity and Forecast: No radio blackouts were observed or forecast for the following three days.

73,

AA0JK
Fred

ATTENTION

The DRC Board of Directors meetings are held on the 4th Wednesday of the month and are open to any member. Due to scheduling of meeting space, the board does not always meet at the same location and on occasion meetings are held via Skype. Anyone wishing to attend, please contact a board member prior to meeting night for specific information.

Colorado VHF Packet Network Map Facelift

BY BILL BUREK, AC0VC

Awhile back it was suggested creating a map which would display the active packet stations here in the local Denver area. After compiling a list of stations and operators I began to work on this project. A sample went to some of the operators and a revamp was underway. Soon a copy went to the DRC Webmaster and what you all saw was many hours of work to supply something users could understand when they wanted to connect to another station.

That map was a challenge for several reasons. Now our network has grown, and will continue from what I am told. We have stations in Bailey and Buena Vista. More stations have joined in Colorado Springs. So as the network grows to display the map we had would mean a confused mess you would not be able to read easily. Hence the "Facelift."

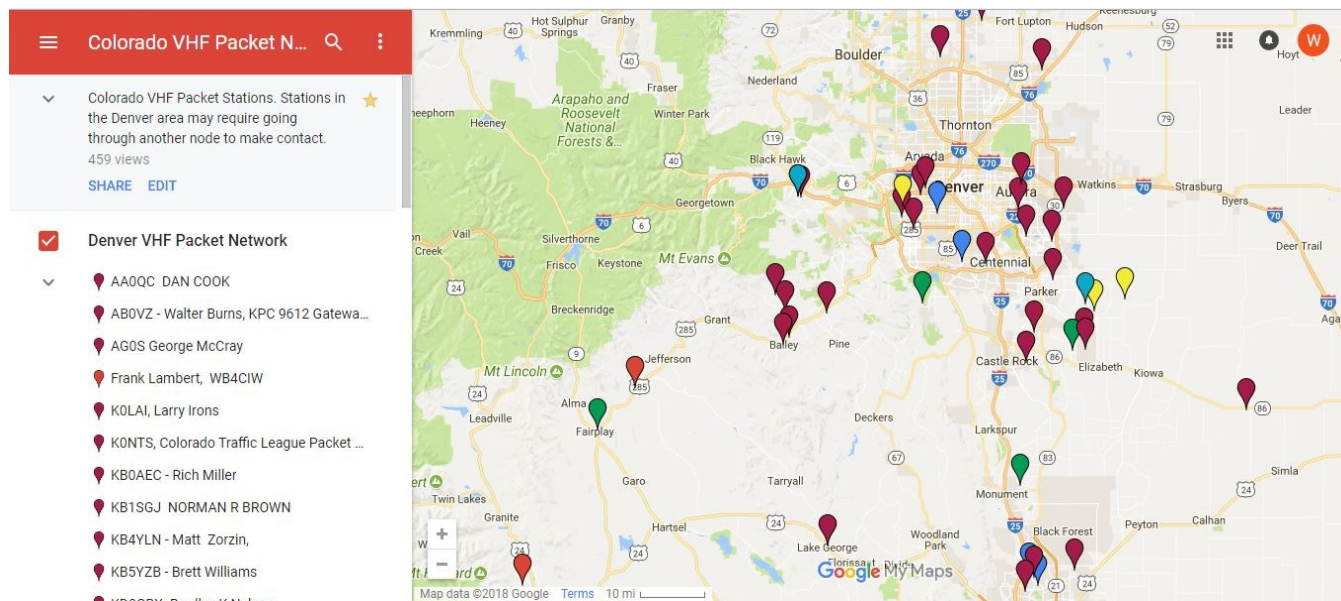
I have provided our Webmaster a link to the actual map. No more confusing balloons and bubbles to clutter things up. When I make a change or correction to the map it is automatic and you will see that change. This also creates less work for me and a faster turnaround time.

Prior to the release I shared the map with local and out of state Paketeers. There were suggestions and comments received. Which led to more changes and another release. What we now have is a cleaner map capable of providing more information and expandable to the state if needed.

You can go to the DRC Website at www.w0tx.org and select the "Packet Network Map" from the menu. Then select, "Click Here to see the Colorado Packet Radio Map." This will get you to the map. You may click on a balloon to retrieve a stations information or go to the Legend on the left. Click the down arrows next to the names. This displays the addresses. Click on an address for the station and you get the station information as well as seeing the corresponding highlighted balloon.

Those who come into the Denver area on HF and Telnet are amazed we have such a network. There are 45 stations operating Packet providing several methods of communications. From keyboard to keyboard, leaving messages in a mailbox, ARES activities and Winlink communications we have it covered.

I hope this enlightens those who think Packet is dead. Not in Colorado anyway.



DMR to Fusion via the SharkRF OpenSpot

BY DAVID HAAN, AA0DH, AA0DH@ARRL.NET

For those of you with an MD-380 radio and a SharkRF OpenSpot you can participate on the DRC's club Fusion repeater as well as a number of Fusion Wires-X rooms (analogous to Talk Groups) without the purchase of another radio. Switching your existing DMR radio between the DMR network and Fusion network can be done directly from your radio with a simple twist of the channel knob and a push of the PTT button.

With the addition of a few channels to your Codeplug and adding a profile to your OpenSpot you will have the capability of converting your DMR voice traffic to C4FM on transmit and converting C4FM voice traffic back to DMR on receive. If this is something that interests you, then read on for a brief explanation of how the network is interconnected and a link to the instructions on setting up your MD-380 and OpenSpot.

Simplified Network Overview

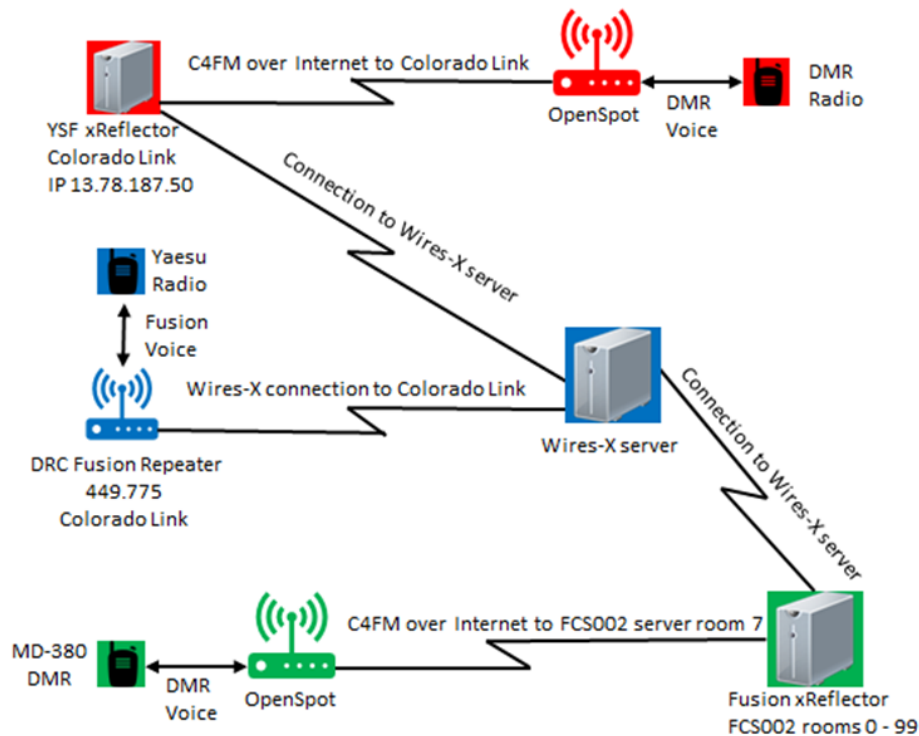
To interconnect DMR to Fusion, the OpenSpot establishes a connection between itself and xReflectors (servers). These in turn connect to the Wires-X system. There are two xReflector systems available. One is the YSF xReflector where each server is associated with a single room. Each of these servers has a connection to the Wires-X network over the Internet. The other system is called FCS. Each FCS server hosts up to ninety-nine possible rooms. As with the YSF system these servers have links to the Wires-X network over the Internet.

Both systems link to the 'Colorado Link' room which the DRC repeater is linked to over Wires-X. For the FCS system the 'Colorado Link' is known as room 7. For the YSF system it is on server IP address 13.78.187.50. Other rooms can also be accessed in addition to the 'Colorado Link', but our club repeater is accessed via DMR to Fusion through the 'Colorado Link'.

Below is a simplified depiction of the relationship between the DRC repeater, YSF servers, FCS servers, the OpenSpot and your MD-380.

Many thanks to Bill (W6OAV) and John (KC0RF) for their assistance in testing. The link to the setup instructions for your MD-380 and OpenSpot is: [w0tx.org/DMR to Fusion via the SharkRF OpenSpot.pdf](http://w0tx.org/DMR%20to%20Fusion%20via%20the%20SharkRF%20OpenSpot.pdf).

See you on Fusion.



ROUNDTABLE FEEDBACK REQUEST

BY EDITOR, AD0UJZ

We'd like to get some feedback from Roundtable readers about the newsletter. You can find a short survey at the following site: <https://www.surveymonkey.com/r/QW5JC5H>. So far we've had 17 responses and would appreciate more to get a better data sampling. The typical time spent by respondents is 3 minutes. So far people have indicated they would like to see more local event details, technical articles and equipment reviews. If you want to submit an article on these or other topics, we'd love to publish it. Reader contributions are always appreciated. Send them over to drc.editor@gmail.com.

Anyhow, please complete the survey and give your honest, anonymous feedback. We want to have a good, informative, entertaining newsletter, and need your assistance in reaching those goals. Thanks!

NASA GOLD MISSION TO IMAGE EARTH'S INTERFACE TO SPACE

BY FRED HART, AA0JK

On January 25, 2018 NASA launched Global-scale Observations of the Limb and Disk, or GOLD, a hosted payload aboard SES-14, a commercial communications satellite. GOLD will investigate the dynamic intermingling of space and Earth's uppermost atmosphere (AKA the Ionosphere), and is the first NASA science mission to fly an instrument as a commercially hosted payload.

GOLD is the newest addition to NASA's fleet of Heliophysics missions. NASA Heliophysics missions study a vast interconnected system from the Sun to the space surrounding Earth.



This is an ultraviolet imaging spectrograph that will give unprecedented insight into the temperature and composition of neutral gases in the thermosphere, the largest part of Earth's upper atmosphere.

NASA Launches GOLD Mission: <https://youtu.be/jLRJXV9D1Mo>

On January 25th, NASA's Global-scale Observations of the Limb and Disk, or GOLD mission, was launched from French Guiana.

The information collected by the Global-scale Observations of the Limb and Disk (GOLD) mission will have a direct impact on understanding space weather and its impact on communication and navigation satellites, which we've come to rely on for HF communications, Ham Radio, cell phones, GPS navigation satellites, Airline communications, and your bank account information.

The data from the GOLD mission will revolutionize our solar reports that we as Hams turn to for information on HF MUF communication conditions.

Stay tuned.

(Photo: AA0JK at the LASP Laboratory for Atmospheric and Space Physics Center, CU Boulder, Colorado. January 24th)



LOAD COILS ON SHORTENED HF ANTENNAS

BY BILL RINKER, W6OAV

The other day there was a discussion on our repeater regarding what is the best location for load coils on shortened HF antennas. The main discussion centered on the fact that even though radiation efficiency improves as load coils are moved further from the feed point one never sees them at the ends of an antenna. There were several theories given. The purpose of this article is to explain the theory.

Since RF current creates the RF signal, the goal is to keep RF current at maximum. It turns out that the best location for load coils on shortened HF antennas is at about 60% to 70% of the distance from the feed point. Figure 1 shows what happens to the RF current as the load coils are moved out from the feed point. Figure 1(a) shows a standard 40 meter dipole. Note that the bulk of the RF current and maximum RF radiation is from the feed point out to about 70% from the feed point. Beyond that the RF current and RF radiation decreases. On the shortened dipole of Figure 1(b) with the load coils approximately at the 60% point the current hasn't decreased that much from that of the standard dipole from the feed point to the 60% point. However, when the load coils are moved further out from the feed point as shown in Figure 1(c), the total RF current rapidly drops. Figure 2 shows the same issues with shortened loaded verticals. So, why is this?

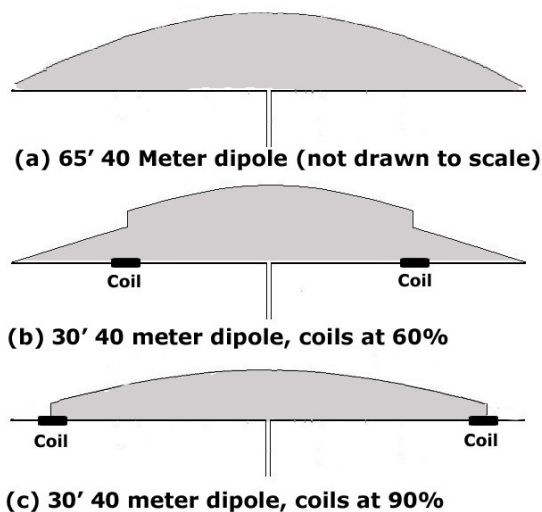


Figure 1 - Current distribution on dipoles

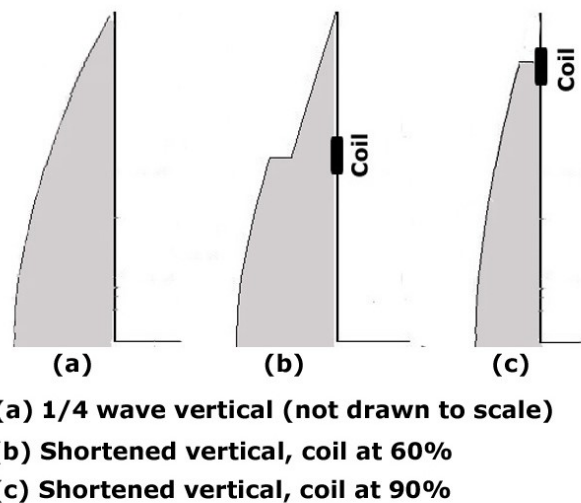


Figure 2 - Current distribution on verticals

Figure 3 shows what happens as a load coils are moved out from the feed point on a shortened 30 foot long 40 meter dipole. The efficiency peaks to 72% compared to a full sized dipole when the coils are between 9 and 10 feet from the feed point. This distance equates to around 60% of the distance from the feed point to the ends of the antenna. Beyond this distance the antenna's radiation efficiency rapidly decreases.

Figure 4 shows why this happens. In order to maintain resonance, the inductance of the load coils must be increased as they are moved out from the feed point. This involves adding more wire and thus increasing the resistance of the load coils. Also, due to the load coil's self-capacitance Q reactions, as the load coils approach the ends of the antenna, circulating currents inside the load coils increase which also effectively increases the load coils' resistance to the RF current. These resistances increase opposition to the RF current thus decreasing its value. Hence, the efficiency of the antenna decreases rapidly as the load coils are moved beyond the 60% location.

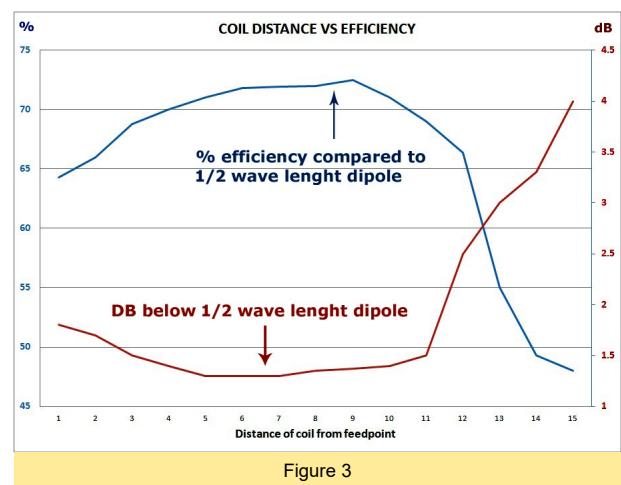


Figure 3

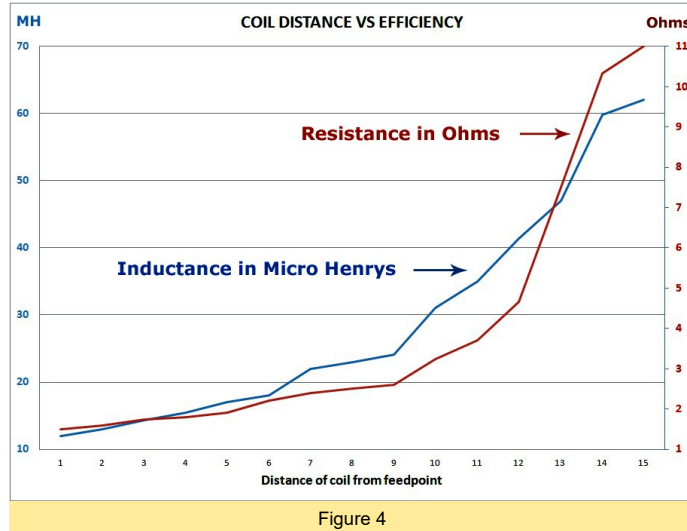


Figure 4

Figure 5 shows a Hustler mobile antenna and a military NVIS dipole. Note that both have the load coils at about 60% from the feed point. Figure 6 shows a commercial shortened 40 meter beam with the load coils at about 60% from the feed point.



Figure 5 – A Hustler and a military dipole with coils at ~60 % out

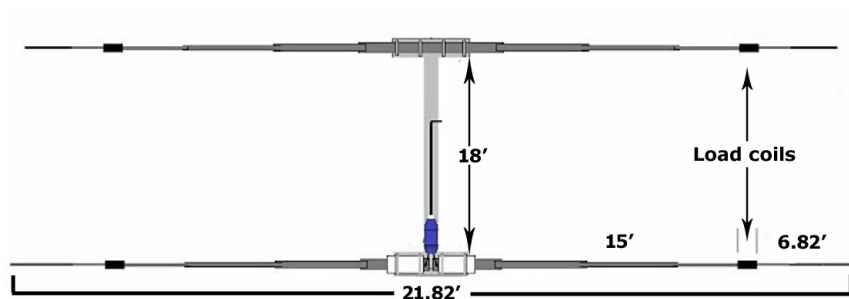


Figure 6 - A shortened 40 meter commercial beam

References:
<https://www.smeter.net/antennas/short-coil-loaded-design.php>
<http://www.zerobeat.net/G4FGQ/> (Vertload.exe)

LOOKING BACK AT THE DRC, PROVIDED BY WOODY LINWOOD (W0UI)

August 1960 - DRC Committees Activity Reports

NEWS AND VIEWS

By PAT, KØEVG

From the By-Laws of The Denver Radio Club, Section 3: **Annual Meeting.** The annual meeting of the members shall be held on the third Wednesday in September of each year at 7:30 o'clock p.m. At said meeting the members entitled to vote shall elect by ballot a plurality vote of such members present four Directors to serve with the four holdover Directors for the ensuing year.

At the end of the club year it is profitable to look back and learn from what we did.

The Nominating Committee presented six eligible members of the club plus the names of the four directors whose terms were expiring. You voted in four directors which made up the total of eight directors which served the club this past year.

Program and entertainment committee was responsible for programs at the regular monthly meetings. This was Mike, WØPG. WØPG with help from KØDCW, KØBTV, KØEVG and others got top-flight speakers from whom the most advanced learned plenty and everyone learned something.

Interference committee. Walt, KØCLJ, numerous chosen helpers and the Board of Directors of the DRC, worked with FCC as needed. A considerable amount of litera-

ture was drafted and printed for this committee.

Publicity committee. Roy, KØOVQ, did a splendid job in getting ads for **The Round Table**. He also squeezed ham news into the dailies.

Membership committee. John, WØFU, talked up the Club to customers at Rapsco.

Activity committee. This committee assumes responsibility for all activities of the Club outside the regular monthly meeting. Larry, WØJGW, was in charge.

Auditing committee is responsible for auditing the financial report of the treasurer. Walt, WØWRO, did the honors for last year's treasurer and will probably be kind enough to undertake the task again this year.

Technical instruction committee, which is responsible for conducting classes of technical instruction for interested persons, was given to Bill, KØAYG.

Special committee for the Denver Radio Club Station was ably conducted by Ralph, WØVDY; Chic, WØSIN, faithfully conducted Field Day again this year.

The members of the board and the chairman from each committee are expected to attend the regular monthly board meetings, or send someone to represent them. This fact should be given serious consideration when accepting such appointments in the club.

On July 20 The Denver Metropolitan Citizen Banders had their regular monthly meeting. Mike, WØPG, was guest speaker and talked on CD. Larry, WØLO, and Pat, KØEVG, were present. It was noted at this meeting that the board members met before the regular meeting. Each chairman of a committee presented a brief report at the regular meeting. One report suggested a change for their meetings to the first Tuesday of the month so as not to conflict with the regular meetings of the DRC. The club meets in a centrally-located place and there is no charge for the use of the building,

At the time of this writing there is considerable ham activity connected with the big Jeffco CD "Operation Aircrash" to take place from noon Saturday, August 13, to 10:00 a.m. Sunday around the Truesdale Ranch west of Evergreen. The 75, 10, 6 and

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FACT OF THE MONTH

Sporadic-E Reflections

The large volume of sporadic-E ionospheric communications logged by Radio Amateurs over the past many years has contributed significantly to understanding the phenomena. There is still more to learn, but many characteristics of sporadic-E communication are now well established. For example, there is a maximum useable frequency (MUF), above which signals are not returned to earth. It may seem counterintuitive at first, but the closer to that frequency one transmits without exceeding it, the further the distance their signal will return to earth via a single sporadic-E reflection. That happens, because the angle of sporadic-E reflection increases as the frequency increases. When the angle increases just to the point where a signal barely returns to earth, it returns at the greatest possible distance.

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HF MAGNETIC TRANSMITTING LOOP TUTORIAL

BY BILL RINKER, W6OAV

If you are interested in HF magnetic transmitting loops go to Precise RF's site at <http://preciserf.com/>. The site has an Application Note/Data Sheet which provides a good "tutorial" on magnetic transmitting loop theory. Also there are informative videos comparing magnetic transmitting loop to commercial dipoles.



✂

HAM SITE OF THE MONTH

[WSPR Net](#)

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THE ROUNDTABLE ARCHIVE

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

THE ROUNDTABLE ARTICLE INDEX

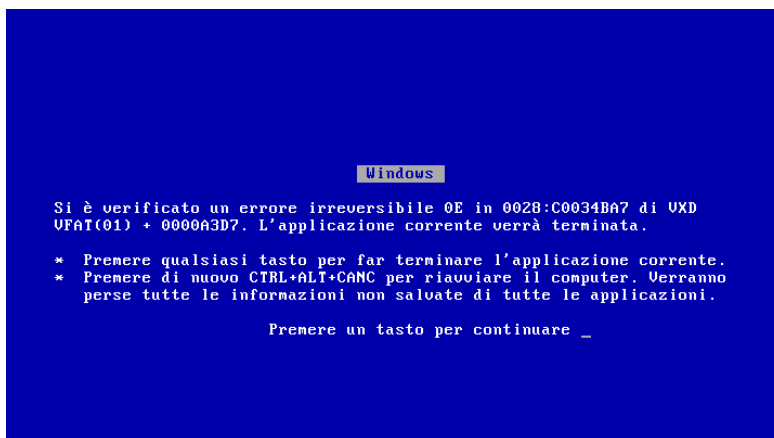
Go to: <http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf>

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. Issues of the *RoundTable* are available at [http://www.w0tx.org/RoundtableArchive/2010-RoundTables/RT201009\(SEP\).pdf](http://www.w0tx.org/RoundtableArchive/2010-RoundTables/RT201009(SEP).pdf)



Bill's flux will be back next month...

UPCOMING EVENTS
HAMFESTS & CONVENTIONS

Event	Date	Location	Sponsor Website
The Swapfest	02/18/18	Adams County Fairgrounds	Aurora Repeater Assoc.

UPCOMING ARRL CONTESTS & EVENTS [ARRL CONTEST CALENDAR](#)

Contest	Start Date	Start Time	End Date	Stop Time	Notes
School Club Roundup	02/12/18	1300 UTC	02/16/18	2359 UTC	
International DX - CW	02/17/18	0000 UTC	02/18/18	2359 UTC	
International DX - Phone	03/03/18	0000 UTC	03/04/18	2359 UTC	

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
Vermont	02/03/2018	02/04/2018	Radio Amateurs of Northern Vermont	
British Columbia	02/03/2018	02/04/2018	Orca DX and Contest Club	
Minnesota	02/03/2018	02/03/2018	Minnesota Wireless Association	
South Carolina	02/24/2018	02/25/2018	Columbia Amateur Radio Club	
North Carolina	02/25/2018	02/26/2018	Raleigh Amateur Radio Society	
Idaho	03/10/2018	03/11/2018	Idaho QSO Party	
Oklahoma	03/10/2018	03/11/2018	Oklahoma DX Association	
Wisconsin	03/11/2018	03/12/2018	West Allis Radio Amateur Club	
Virginia	03/17/2018	03/18/2018	Virginia QSO Party	
Louisiana	03/17/2018	03/18/2018	Louisiana Contest Club	Based on 2017 date.

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. 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 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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FEBRUARY 2018							<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	
							
4	5	6	7 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)  Last Quarter	8	9	10	
11	12 School Club Roundup - Begins 1300 UTC	13	14 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL) 	15  New Moon	16 School Club Roundup - Ends 2359 UTC	17 Int'l DX - CW - Begins 0000 UTC	
18 Int'l DX - CW - Ends 2359 UTC	19 	20	21 DRC Meeting Elmer 6 PM General 7 PM 	22	23  First Quarter	24	
25	26	27	28 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	 Full Moon			

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Web Master	N0LAJ	Bill Hester	<i>Check Roster</i>	<i>Check Roster</i>

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.

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. The submission deadline is the 20th of the Month. ~ Editor