ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917 **June 2018**

President's Message

By Gerry Villhauer, W0GV

Hello DRC Members,

Summer is definitely here; I am seeing temperatures in the mid 90's today.

Our next major event is the annual ARRL Field Day on June 23-24. We devoted about half of our last regular meeting to bring you up to date of our field day plans. If you missed the meeting, please don't miss field day. You can come for a few hours or spend the whole two days on site. Dave (K0HTX) is our chairperson this year and we can use help setting up and tearing down the site. We will have several stations in operation throughout the event. If you have not operated on the HF bands, this is a real opportunity to get your feet wet and see what it is all about. No matter what the class of your license or if a friend or family member has no license, this is the time to get on the air. We will have refreshments and food courtesy of The Salvation Army. You are welcome to bring a motor home, trailer or tent camp and, we will have a handicap portapotty. We will again be at the Chief Hosa campgrounds, which is only about a half hour west on I-70. See the DRC website w0tx.org for more details or contact Dave (K0HTX) with questions.

Thanks to Orlen (WW0LF) for the second part of our May meeting. Orlen's presentation titled: *Fox Hunting with a Mission*. The story of FCC mobile direction finding – WWII to the '60s was very interesting and included some actual equipment used by the FCC to track down interference and offenders.

Our June program will be another very interesting general interest presentation by Will Perkins (W1ZRV). He will be giving us an overview and his personal experience in the roll of FEMA during major disasters and, how amateur radio operators can contribute in disaster communications. Will says there have been many changes over the years, especially since Hurricane Katrina. Mark your calendars for June 20th so as not to miss this interesting program.

Next is our Really Big Event for the summer, the DRC Hamfest on August 26th. Please, help us get the word out for our Hamfest. This is a major financial event for the club and we need YOUR HELP getting the word out to everyone in the ham community. Talk it up on the air and with your ham and non-ham friends. If you think of someone you think could be a vendor, let them know about it. If you belong to another club besides the DRC, talk it up there please! Get your table reservations in NOW! If you need electric power for your table, they are on a first come basis and we already have several vendors requesting power. We are counting on YOU! Please help make our Hamfest the best ever.

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 Roundtable.

73 for now,

Gerry (W0GV)
President

May Meeting – What'd I Miss?

By Brennan Pate, AD0UZ

The May meeting was started off by Gerry (W0GV) greeting the 45 people in attendance and then turning it over to Dave (K0HTX) to talk about Field Day 2018 (June 23rd – 24th). Dave provided an outline of what Field Day is, what the club does, site info and the stations that will be setup. The plan is to start setup around 2 PM on Friday (June 22nd) at the Chief Hosa campground (side north of I-70). People can camp overnight if they'd like but no open fires are allowed, only camp stoves. The contest goes from noon Saturday through noon Sunday. It's a great opportunity to bring friends or family and get them on the air, even if they aren't licensed. For further info, please visit: arrl.org/field-day and w0tx.org/fieldday.htm. If you'd like to help setup the stations, take items up to the site on Friday or down on Sunday please contact Dave. His info is available at the end of the newsletter.

After Dave gave his presentation Orlen (WW0LF) gave a talk on the FCC's mobile radio direction finding service. He provided some photos, one of which was a horse-drawn wagon from WWI in France. He proceeded to talk about the progress made over time up to around WWII. The main purpose of the service was to find pirate stations, spy activity, racetrack touts and bootleggers.

The FCC had "prowl cars" in the 1940s. They contained a receiver (often a Hallicrafter SX28), wax drum recorder, Finch loop on the roof, sense antennas, and other necessary equipment. Orlen had some of the original equipment on display. It had been given to the DRC by the FCC when they were closing a regional office. Orlen explained how the antenna works and gave the background on the loop and other technical aspects of the equipment. At the end he fielded several questions and the meeting was adjourned.

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:

Caleb Moose - W4XEN	Robert Baumann - WV0Z
James Russell - KE7ZK	Robert Bogin - KE0RQX

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 current issues.

DRC/TSA Aurora Site (WW0LF)
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. Orlen is working on getting TSA the additional info that they requested.

Station 4 Remote Power Control (WG0N)
Goal: Install Internet controlled power outlets.
Status: WG0N has installed an Internet controlled outlet power strip at Station 4. We are hoping to get the new internet operational soon.

Centennial Cone Remote Power Control (W0GV)
Goal: Document equipment to be controlled by the Internet controlled power outlets. Install the outlets.
Status: Orlen will set up the control through the 7330 controller that is in the rack for the other two repeaters.

Fusion Repeater Move (W0GV)
Goal: Discuss the feasibility of moving the Fusion repeater to a better coverage location.
Status: Feasibility study is in progress.

Fusion Repeater WIRES Interface (W0GV)
Goal: Get the WIRES Interface on line.
Status: Pending.

Fusion Repeater WIRES Interface (W0GV)
Goal: Train several club members how to program and maintain the Fusion Repeater system.
Status: Pending

Additional Notes:
Dave (WG0N) will check antennas on the tower at station 4.

June Meeting Presentation

By Editor

See *President's Message*.

Learning Net Report

By Fred Hart, AA0JK

Thanks goes out to our net controllers: Larry (K0LAI), Alex (KS0E) and Doron (K1DBC). The following topics were discussed this past month:

- Mobile Installation and Station Grounding references:
Technical: ac6v.com
K0BG: k0bg.com
Grounding: ac6v.com/techref.htm#GR

- Antennas and related topics @ W8JI: w8ji.com

- Notes on grounding amateur and commercial radio installations:
SWS Security White Papers: swssec.com/grounding.html
Lightning Protection & Grounding -- From PolyPhaser -- Click on Support, then Technical Notes
How to Protect Your House And Its Contents from Lightning: polyphaser.com/products/data-line-surge-protection

- Grounding and Bonding for the Radio Amateur: ARRL Item No. 0659

- Amateur Radio on the Move: Take your radio with you! Advice for operating your radio from your car or RV, boat, airplane, motorcycle or backpack. Item No. 9450

- Project in the works: µBITX is a general coverage HF SSB/CW transceiver kit. hfsignals.com/index.php/ubitx/

- The 'star-trek' enclosure that is available for the uBitX: bitxhacks.blogspot.com

- AD0ZM / KE0QOD: Keep us posted.

- Field Day – Be There: Saturday & Sunday, June 23rd & 24th. Chief Hosa campground – See Denver Radio Club's webpage for details.

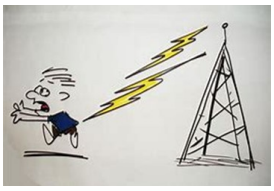
- Fox hunt - Ham radio hidden transmitter hunting ("Radio Direction Finding") youtu.be/eQSiTqH9Dzw and arrl.org/direction-finding

- Radio Direction Finding Projects: theleggios.net/wb2hol/projects/rdf/rdf.htm

- Malicious interference: w4bbb.org/home/malicious-interference-policy

- Ham who interferes with public safety communications loses license. "N8CAM loses his license and $3K for using cloned radio on Michigan state radio system." kb6nu.com/mi-ham-who-interferes-with-public-safety-communications-loses-license/

- Tis the stormy season when we need to unplug the shack when it is not in use. Antenna and power outlet.



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.

EmComm Note

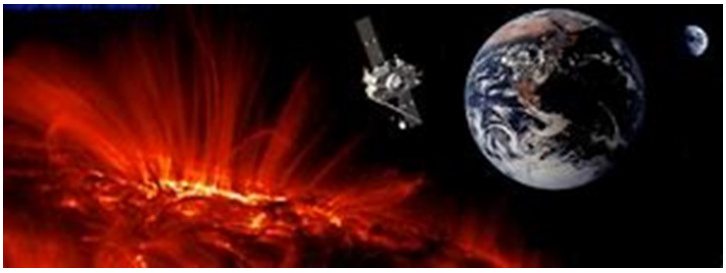
Provided By Brennan Pate, AD0UZ

The Wheatridge siren test was successfully completed on May 9th. According to reports from Jim (K0TOR) the test was a success and, “Corp Baker of the Wheat Ridge Police Department sent great feedback. It was his first experience with siren testing and he was impressed by how professional and organized the team was. It definitely takes a team effort and it is gratifying to get the continued support from everyone working in the field.” According to Tom (K6HJV), he had a blast. He said… well, I can’t remember exactly, but he had a great time and certainly wants to help next year.

Thanks to the following people for their help with the Wheatridge test: KD0SYD, KE0EUS, KD0NRO, AE5IT, K6HJV, KD0YBD, AD0GX, KD0WMO, WZ0S, G7LWN, WW0LF, W4PRG, KJ6BIT, N0PQV, AA0JK, K0WSU and K0TOR.

Solar Update

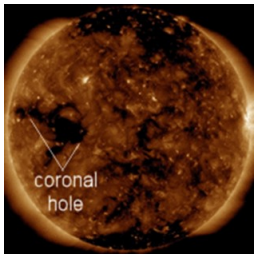
Provided By Fred Hart, AA0JK



May 1st - The new month was starting off with the Sun at very quiet levels. There were no visible sunspot regions and this also meant there would be no chance for any noteworthy solar flares. Geomagnetic activity also remained at quiet levels with no disturbances in the forecast.

No Sunspots: Solar activity was very low and no sunspots were present on the visible disk. No CMEs were observed in Coronagraph imagery.

THE FIRST SOLAR WIND STREAM OF MAY: A hole in the Sun’s atmosphere was turning toward Earth, spewing a stream of solar wind that was forecast to reach our planet on May 6th. NOAA forecasters said G1-class geomagnetic storms were possible when the gaseous material arrived.



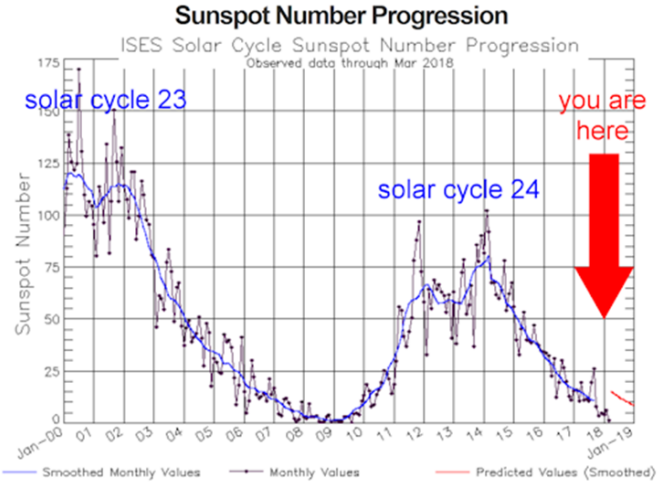
Solar wind flowing from this equatorial coronal hole was forecast to reach Earth on May 6th. Credit: SDO/AIA

SUNSPOTS VANISHING FASTER THAN EXPECTED: Sunspots were becoming scarce. Very scarce. So far in 2018 the Sun has been blank almost 60% of the time, with whole weeks going by without sunspots.

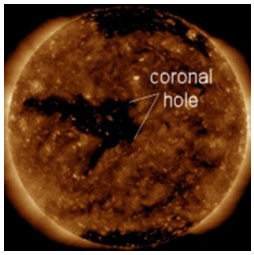
The fact that sunspots are vanishing comes as no surprise. Forecasters have been saying for years that this would happen as the current solar cycle ("solar cycle 24") comes to an end. The surprise is how fast they are vanishing.

"Solar cycle 24 is declining more quickly than forecast,” stated. NOAA’s Space Weather Prediction Center on April 26th.

This plot shows observed sunspot numbers in blue vs. the official forecast in red (in the image to the right):

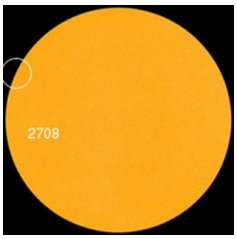


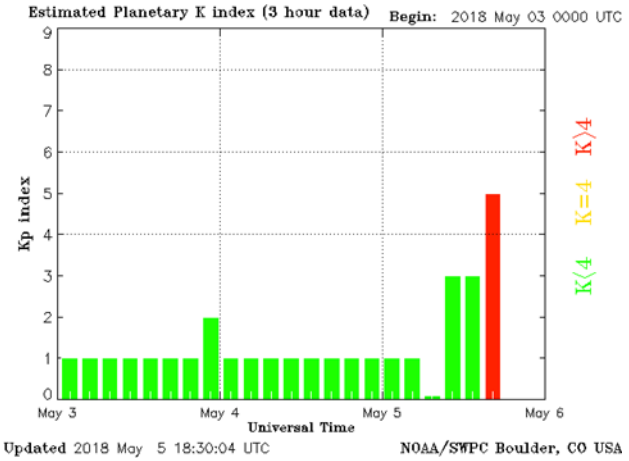
May 3rd - A HOLE IN THE SUN'S ATMOSPHERE: Cutting across half of the solar disk, a wide hole in the Sun's atmosphere was turning toward Earth and spewing a stream of solar wind toward our planet. This extreme ultraviolet image from NASA's Solar Dynamics Observatory shows the gaseous canyon.



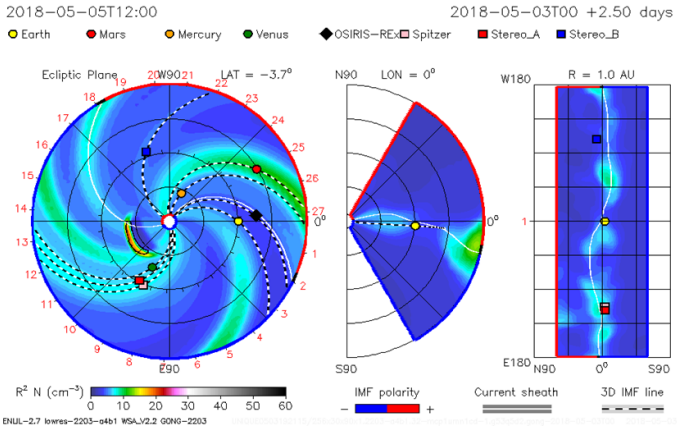
Solar wind flowing from this equatorial coronal hole was expected to reach Earth on May 6th or 7th. Credit: SDO/AIA. NOAA forecasters said, G1-class geomagnetic storms were possible when the solar wind arrived.

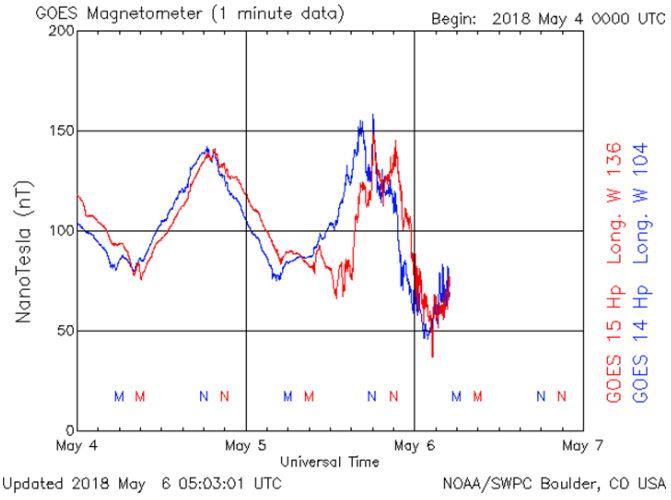
May 5th - Sunspot AR2708 emerged rapidly on May 4th, but it was already decaying. Meanwhile, another sunspot was rotating into view at the circled location. Credit: SDO/HMI





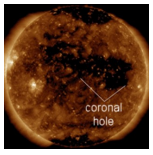
Week Two:





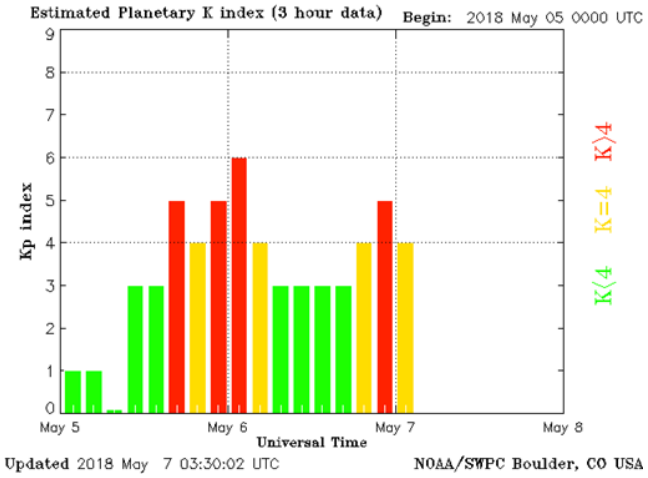
May 6th - GEOMAGNETIC STORMS INTENSIFY: Geomagnetic storms intensified to category G2 as Earth moved deeper into a stream of fast-moving solar wind. The gaseous material was flowing from a wide hole in the Sun's atmosphere.

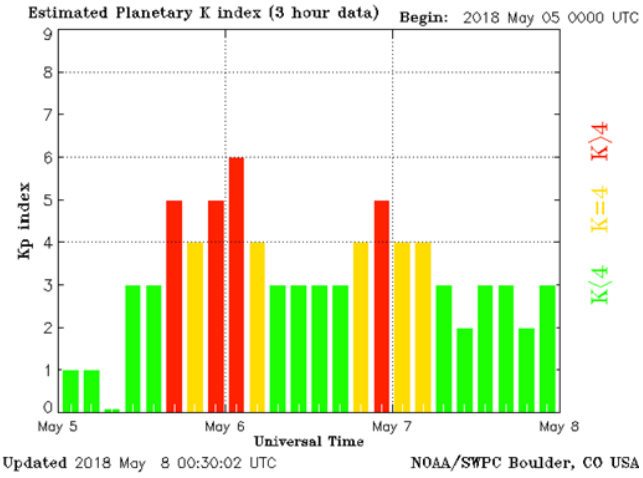
G2- (Moderate) Geomagnetic Storm Impacts: Power systems: High-latitude power systems may experience voltage alarms. Long-duration storms may cause transformer damage. Spacecraft operations: Corrective actions to orientation may be require by ground control, possible changes in drag affect orbit predictions. Other systems: HF radio propagation can fade at higher latitudes.



Solar Wind
Speed: 644.0 km/sec
Density: 6.1 protons/cm3

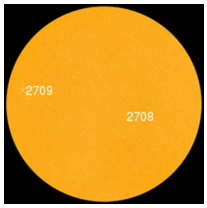
Updated: 5-06-18 at 0447 UTC: Earth was inside a stream of solar wind flowing from the indicated coronal hole. Credit: SDO/AIA



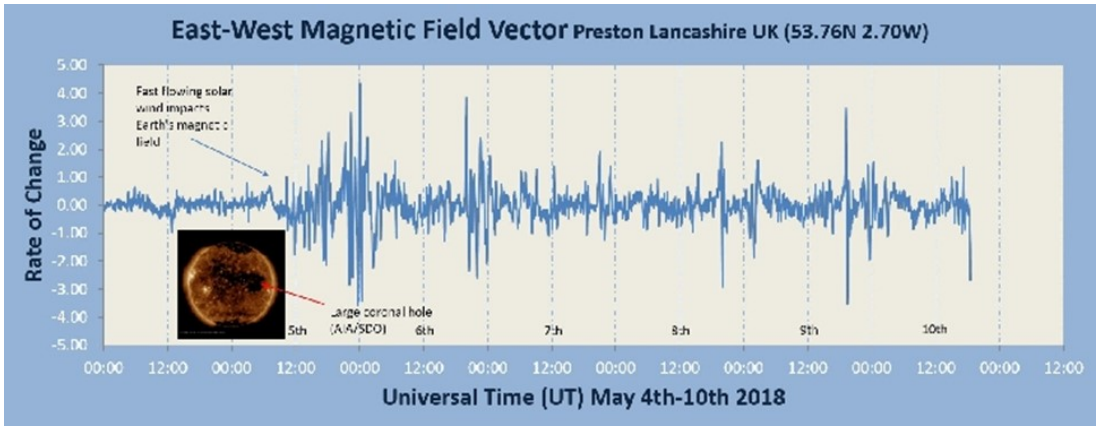


May 7th - With gusts of nearly 700 km/s, the solar wind stream had so far produced geomagnetic storms of category G1 and G2. The gaseous material was flowing from a wide hole in the Sun's atmosphere, so wide that Earth was expected to remain inside the stream for several days. NOAA forecasters said there was a 55% chance that storming would continue on May 6th and 7th.

May 10th - EXITING THE SOLAR WIND STREAM: After five days inside a stream of high speed solar wind, Earth was finally making its exit. Solar wind speeds were gradually subsiding below 600 km/s. NOAA forecasters estimate a 30% chance of polar geomagnetic storms on May 10th, dropping to 10% on May 11th as we moved away from the gaseous material. These small sunspots had stable magnetic fields that posed little threat for solar flares. Credit: SDO/HMI



May 11th - MAGNETIC UNREST: Late on May 5th, Earth entered a stream of solar wind. More than 5 days later, Earth's magnetic field was still reverberating.



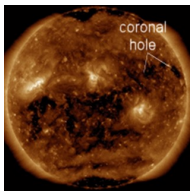
Sustained periods of unrest on May 5th and 6th coincided with G1, and G2 class geomagnetic storms. Periods of quiet returned on May 7th through 10th.

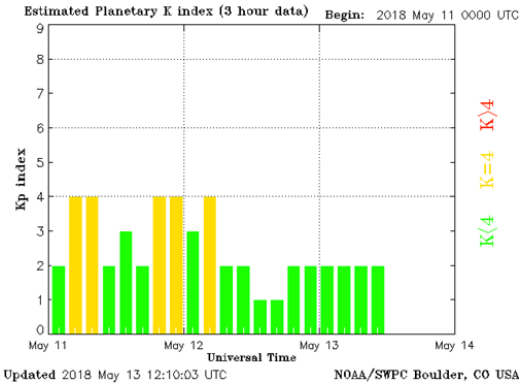
Activity was expected to subside as Earth made its exit from the solar wind stream on May 11th and 12th

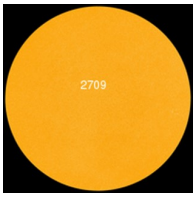
It was forecast that this activity would return again in early June as the coronal hole would be rotating back around, lighthouse style, and in full force.

Earth was exiting a stream of solar wind flowing from the indicated coronal hole. Credit: SDO/AIA

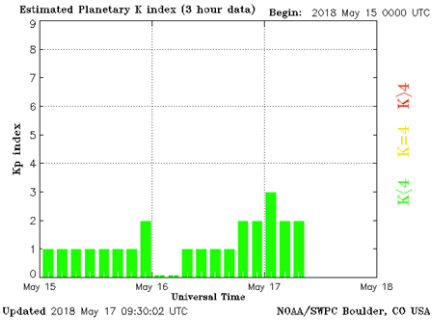
Week Three







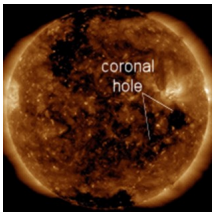
Almost-invisible, Sunspot AR2709 had a stable magnetic field that posed no threat for strong solar flares. Credit: SDO/HMI. Solar wind flowing from the indicated coronal hole was expected to reach Earth on May 17th. Credit: SDO/AIA



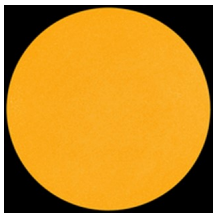
This week there were three new bright regions on the Earth-facing side of the Sun. One region even launched a solar storm on the Sun's backside. Not bad for a supposedly quiet Sun! The week's forecast for these regions indicated a boost for HF communications.

May 17th - A small coronal hole was facing Earth. A brief period of minor (G1) geomagnetic storming was in the forecast for the following 24 hours.

CHANCE OF STORMS: NOAA forecasters said there was a 60% chance of G1-class geomagnetic storms during the late hours of May 17th when a stream of solar wind was expected to rattle Earth's magnetic field. The gaseous material was flowing from a southern hole in the Sun's atmosphere.



Solar wind flowing from the indicated coronal hole, was forecast to reach Earth during the late hours of May 17th. Credit: SDO/AIA

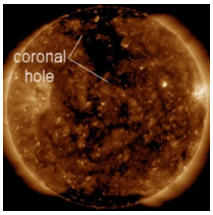


The Sun was blank--no sunspots. Credit: SDO/HMI

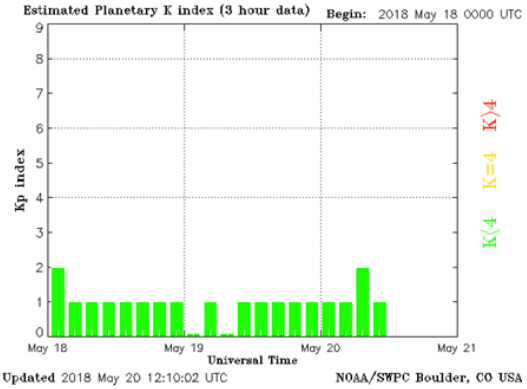
A short blast of fast solar wind was expected to bump us back into active conditions over the following two days.

The Sun was keeping amateur radio operators happy, as a new bright region rotated into Earths view. This region was boosting the solar flux and would keep radio propagation at marginal levels on the Earth's day facing side over the following three days.

Week Four

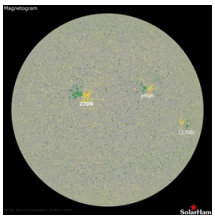


May 20th - Solar wind flowing from the indicated coronal hole was expected to brush against Earth's magnetic field on May 23rd. Credit: SDO/AIA

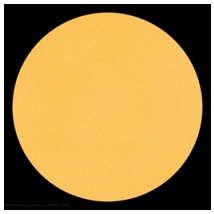


NO GEOMAGNETIC STORMS: NOAA forecasters said the chance of geomagnetic storming was no more than 10%. This low value came as Earth began to traverse to a quiet region of space between streams of solar wind. The next solar wind event was expected on May 23rd when a fast-moving stream was expected to brush against our planet's magnetic field.

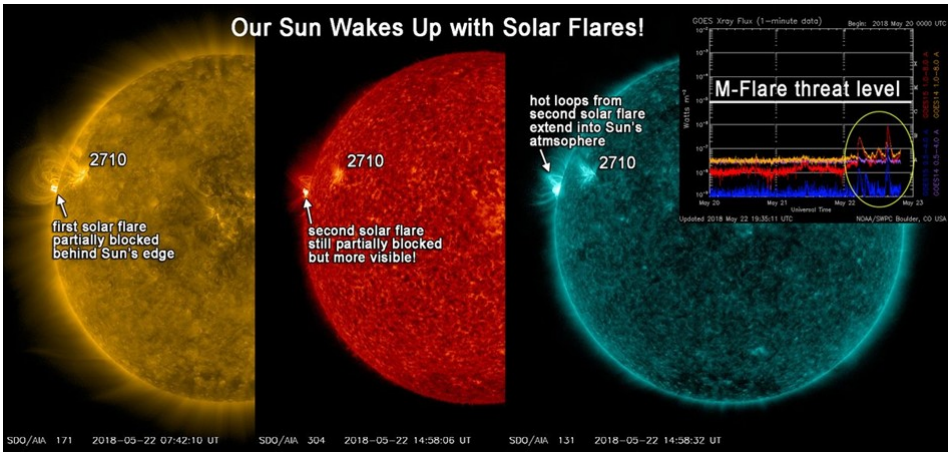
Several bright regions were on the Earth-facing side of the Sun. No Sunspots. HF was at poor propagation levels, especially on the Earth-facing day side. Magnetogram (Colorized Version. Left image.) HMI / SDO.



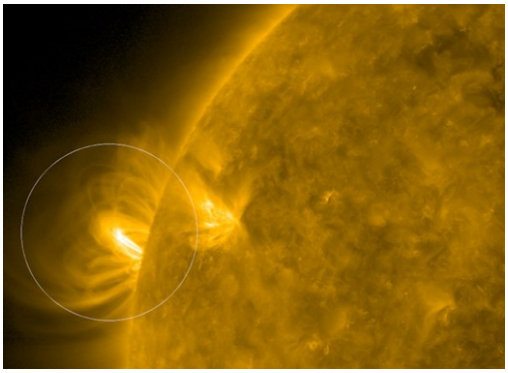
This image (right) shows the magnetic field directions near the surface of the Sun. White and black areas indicate opposite magnetic polarities, with white showing north (outward) polarity and black showing south (inward) polarity. Credit: SDO / HMI Intensitygram.



May 22nd - The Sun wakes up with a bang! A new region rotating into Earths-view fires two solar flares partially behind the Sun's limb. This region (likely to be numbered 2711) was not causing radio blackouts, but amateur radio operators expected more noise on the bands & better propagation!



Chance of minor storms: NOAA forecasters said there was a 40% chance of minor geomagnetic storms on May 23rd when a stream of solar wind grazed Earth's magnetic field. The gaseous material was flowing from a northern hole in the Sun's atmosphere.



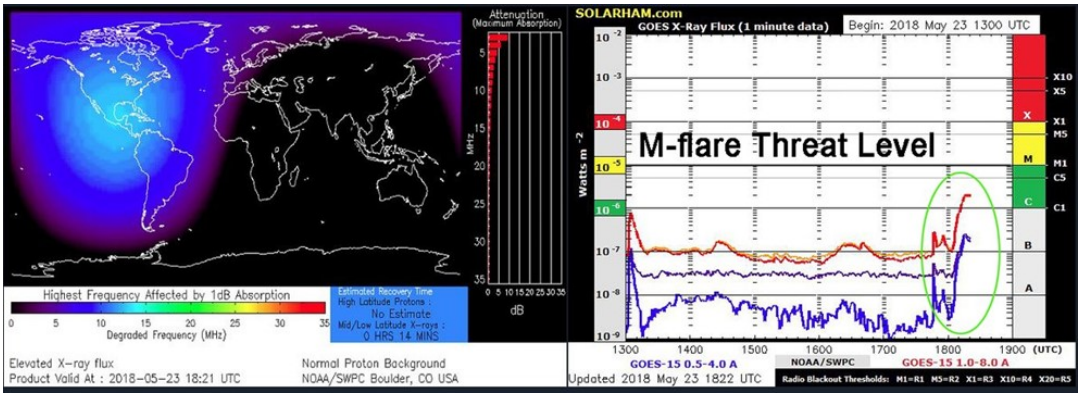
A flair was forming and on it's way: Just behind the Sun's eastern limb, a new sunspot has formed and it was crackling with solar flares. The Sun's rotation was about to turn the active region toward Earth. In this image from NASA's Solar Dynamics Observatory, we were already seeing the sunspot's plasma-filled magnetic canopy peeking over the edge.

May 23rd - Things had been really quiet on the Sun, however a possible new active region was about to turn into view off the east limb. A number of very minor B-Flares were being detected and there was likely to be a chance for an isolated C-Flare as well.

Solar wind grazes Earth: Earth was entering a stream of solar wind flowing from a northern hole in the Sun's atmosphere. The gaseous material was grazing our planet's magnetic field at speeds approaching 500 km/s--fast enough to cause minor geomagnetic unrest but probably not a full-fledged geomagnetic storm.

Something in the offing: Just behind the Sun's eastern limb, a hidden sunspot was crackling with solar flares.

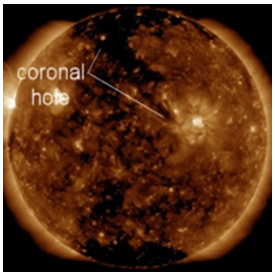
All eyes on the Sun! A new active region was rotating into Earth-view, firing off C-class flares! Ham radio operators were expecting noise on the bands on Earth's day-side.



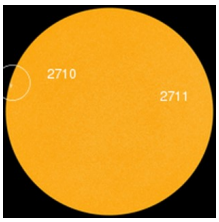
Dr. Tamitha Skov @TamithaSkov - Flare & Solar Radiation Storm Outlook: New bright regions rotated into Earth-view. One was actively flaring! Solar flux boosts Ham radio propagation back to marginal levels on Earth's day side. No Radio-Blackouts were expected. https://youtu.be/3TbE7svHfYA, TamithaSkov.

The Sun wakes up this week with several new bright regions that had rotated into Earth-view. The newest of these regions had been actively firing solar flares since it was on the Sun's backside. All this activity had boosted the solar flux so amateur radio operators and emergency responders were enjoying decent radio propagation. Meanwhile some pockets of fast wind continued to pummel Earth, keeping things at unsettled conditions. The wind wasn't fast enough to bring us up to storm levels.

May 25th - DIPPING IN AND OUT OF THE SOLAR WIND: Earth was exiting a stream of solar wind. More was following and expected to arrive on May 27-28th . The gaseous material was flowing from a northern hole in the Sun's atmosphere.



Solar wind flowing from this coronal hole was expected to reach Earth on May 27-28. Credit: SDO/AIA.



An active sunspot was emerging at the circled location. At the same time, new sunspot AR2711 was growing rapidly. Solar Minimum was taking the day off. Credit: SDO/HMI.

Lack of sunspots is normal during solar minimum, but here, solar minimum seems to be taking the day off. Two sunspot groups were emerging on opposite sides of the Sun. The sunspot on the right was growing rapidly, while the one on the left was crackling with B- and C- class solar flares.

Earth-orbiting satellites had detected almost two dozen minor eruptions. Their combined effects were expected to be noticeable to radio operators in the form of HF brownouts and other upsets in propagation.

Summary: Solar activity was very low. Region AR2712 exhibited intermediate and leader spot development, but remained quiet. Region AR2711 remained quiet and stable as it approached the NW limb. No Earth-directed CMEs were observed in available coronagraph imagery.

Forecast: Issued: 2018 May 28 0030 UTC. Prepared by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center. Solar activity was expected to continue at very low levels throughout the forecast period (28-30 May), with a slight chance for isolated C-class flare activity.

No R1 (Minor) or greater radio blackouts were expected. No significant active region flare activity were forecast.

73,

Fred
AA0JK

VE Team Report

By Tom Kocialski, KC2CAG

On 26 May, 2018, Will Perkins, W1ZRV, conducted a class for Tech licensees who wished to upgrade to General. As usual in Will's classes, the success rate was outstanding – 100% in this case! – even if it was only two candidates: Henry, KE0RJU, and Terry, KD0MNT. Congrats to them and to Will.

We announce our VE Test Sessions on the ARRL Website, and two walk in candidates were also served by the DRC VE Team. One candidate took the Tech exam and passed, and the other candidate took and passed the Tech and General exams. Congrats also to them.

Thanks again to our stalwart VE Team members who supported the session: (In no particular order) Eric (N2ES), Will (W1ZRV), Fred (AA0JK), Bill (WZ0S), Ron (AC0UV) and Gerry (W0GV, "The Boss"). Clearly our team members outnumbered the candidates, but apparently we did not intimidate them.

Tom
KC2CAG
DRC VE Team Lead / ARRL VE Liaison

Field Day 2018 - It's Here. Be There!

By Fred Hart, AA0JK

Get those radios and antennas ready, June is Field Day Month.

ARRL Field Day is the single most popular on-the-air event held annually in the US and Canada. On the fourth weekend of June of each year, more than 35,000 radio amateurs gather with their clubs, groups or simply with friends to operate from remote locations.

Field Day is a picnic, a camp-out, practice for emergencies, an informal contest, an opportunity to introduce amateur radio to the community, and, most of all, FUN

Philip Gildersleeve, W1CJD (1908-1966)

Megan (K0MRS) Kathleen (K0KRS)

Dave and Katie At the Gedunk Food Truck

It is a time where many aspects of Amateur Radio come together to highlight our many roles. While some will treat it as a contest, other groups use the opportunity to practice their emergency response capabilities. It is an excellent opportunity to demonstrate Amateur Radio to the organizations that Amateur Radio might serve in an emer-

gency, as well as the general public. For many clubs, ARRL Field Day is one of the highlights of their annual calendar.

The contest part is simply to contact as many other stations as possible and to learn to operate our radio gear in abnormal situations and less than optimal conditions. We use these same skills when we help with events such as marathons and bike-a-thons; fund-raisers such as walka-thons; celebrations such as parades; and exhibits at fairs, malls and museums — these are all large, preplanned, non-emergency activities. But despite the development of very complex, modern communications systems — or maybe because they ARE so complex — ham radio has been called into action again and again to provide communications in crises when it really matters. Amateur Radio people (also called "hams") are well known for our communications support in real disaster and post-disaster situations.

Field Day is officially an operating event not a contest. The purpose remains today as it did in the beginning: to demonstrate the communications ability of the amateur radio community in simulated emergency situations.

Groups across the continent use Field Day as a literal "show and tell" exhibition. At sites from the tundra of Alaska to the sandy beaches of Puerto Rico, amateur radio brings together its resources to show officials in government and various agencies what "amateur radio can do."

Join us at the Chief Hosa campground, Golden Colorado for this event. See our web-page for directions.

73,

Fred
AA0JK

Editor's Note: If you would like to help with taking materials up to the campground (Friday), help with setup, help tear down, or take materials back down the mountain, please contact Dave (K0HTX). His contact info can be found in the roster or on the last page of the newsletter.

Listen to Ham Programs on Shortwave

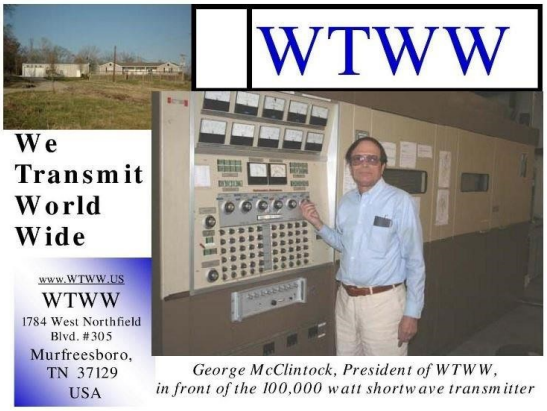
By Bill Rinker, W6OAV

Shortwave station WTWW out of Tennessee, which broadcasts lots of oldies music and shows from Nashville, also broadcasts interesting ham programs. WTWW has a very strong signal...you can copy it well, even with a portable shortwave radio.

The ham programs shown below are currently broadcasted on either 9.475 MHz or 5.085 MHz.
"QSO Radio Show"
"Ham Nation Live"
"Amateur Radio News Line"
"Live Theater Organ from the Ozarks with Bob Heil, K9EID"

A schedule of programs, times and frequencies is available at http://qsoradioshow.com

Listen online live to WTWW by accessing http://wtww.us/pages/listen-live.php and then clicking on "Transmitter 2".



George McClintock, President of WTWW, in front of the 100,000 watt shortwave transmitter

Transmitter Location; Lebanon, Tennessee, USA

How Does Your Station Connect to Wifi

By Bill Rinker, W6OAV

Ever wonder how your mobile device or computer (station) establishes a WiFi (802.11) connection with a WiFi Access Point (AP)? If so, read on. The following is a very high level overview of the connection process.

When a station's WiFi is enabled it enters the active scanning mode. It transmits Probe Requests to discover nearby 802.11 APs. Probe Requests advertise the station's data rates, MAC address, channel number and 802.11 capabilities such as 802.11n, encryption, etc. The Probe Requests can be for a specific SSID (wireless network name) previously connected to or can be a broadcast Probe Request. The broadcast Probe Request contains an SSID of binary 1s to which all APs that hear it will respond.

When an AP hears a Probe Request with its SSID or a broadcast Probe Request it will check to see if the station has at least one common supported data rate, encryption (WPA, WEP), 802.11 capabilities etc. If all parameters are compatible, a Probe Response is sent advertising the AP's SSID, supported data rates, encryption, and other 802.11 capabilities. See Frames 1 and 2 in Figure 1.

If a station hasn't received a response to its Probe Requests it may also enter the passive scanning mode listening for beacons which APs transmit every 10 seconds. The station will build up a list of network beacons heard. The station will also periodically transmit Broadcast Probe Requests to obtain SSIDs of APs that are in the "hidden mode"; that is, not broadcasting their SSIDs.

As a side note, there are several reasons to turn off the station's WiFi when not using the WiFi. The first involves saving battery power and the second involves security.

1.) In the active scan mode the station continually broadcasts Probe Requests. In the passive mode the station's WIFI receiver is in the continuous high gain high power mode. Both modes cause extra battery usage.

2.) The station's SSID and unique MAC address are contained in the Probe Requests. Anyone with a "Sniffer" can track the station. For example, some shopping malls and airports use this method to determine what stores are visited. Ever seen a phone display "Turn on WiFi for better location accuracy"? This opens up a whole can of worms relative to privacy.

Before a station can transmit Internet traffic through an AP, it must be in the appropriate connection state with that AP. Figure 1 provides a very high level overview of the connection process. There is a lot of very complex information that is packed within the Request and Response frames. The same is also true within the Data frames between the station and the AP.

Figure 1 shows the six frame transmissions that take place between an AP and a station required to complete the connection between them.

Frame 1 – As described above, the station sends the SSID of the network with which it wishes to connect.

Frame 2 – The AP responds if it wishes to allow the station to connect to its network. The AP transmits its capabilities, data rates, encryption, configuration, etc.

Frame 3 – The station transmits its capabilities, data rates, configuration, the authentication algorithm (WPA, WEP, SKA, OSA, etc) it wishes to use.

Frame 4 – The AP allows the station access if the station meets its rules. The rules may be proper SSID, specific MAC address, proper authentication process, etc.

Frame 5 – The station sends the parameters, such as the data rate, encryption, etc that it wants to use.

Frame 6 – If the AP is compatible with the station's requirements. The AP sends the Association ID identifying the logical channel, supplies the IP address for the station and a gateway address.

Bi-directional Internet traffic may now flow between the station and the AP.

Reviewing Figure 1, there are three 802.11 connection states:

- Not authenticated or associated (Frames 1 and 2).
- Authenticated but not yet associated. (Frames 3 and 4).
- Authenticated and associated. (Frames 5 and 6).

A station must be in an *authenticated and associated* state with the AP before a connection to the Internet can occur.

Figure 1 - 802.11 Connection Setup

References:
WiFi Telephony, Praphul Chandra, David Lide
https://frdgr.ch/wp-content/uploads/2015/06/Freudiger15.pdf
https://www.crc.id.au/tracking-people-via-wifi-even-when-not-connected/

AMATEUR RADIO PARITY ACT LANGUAGE INSERTED IN NATIONAL DEFENSE AUTHORIZATION ACT

PROVIDED BY FRED HART, AA0JK - FROM THE ARRL

ARRL is praising the work of US Representatives Joe Courtney (D-CT), Vicky Hartzler (R-MO), and Mike Rogers (R-AL) for their successful efforts in securing language in the National Defense Authorization Act (NDAA) for Fiscal Year 2019 that aids in the survival and growth of Amateur Radio by giving radio amateurs the right to install an outdoor antenna at their residences with the approval of their homeowners associations. This language — text from the proposed Amateur Radio Parity Act (HR 555) — formed the basis for the Courtney-Hartzler-Rogers Amendment to the NDAA.

http://www.arrl.org/news/amateur-radio-parity-act-language-inserted-in-national-defense-authorization-act

Fact of the Day

Metal Oxide Varistors

Most surge protectors installed inside homes are a type known as Transient Voltage Surge Suppressors (TVSS). TVSS's that provide both Line-to-Line (L-L) and Line-to-Ground (L-G) protection have voltage clamping devices of some kind connected across the AC line and from one or both lines to ground. A variety of voltage-clamping devices are used, but Metal Oxide Varistors (MOV's) are most common. Clamping voltages vary, but in home applications MOV's typically do not conduct significantly until the voltage across them reaches about 333 volts. At that voltage they essentially short-circuit to prevent further voltage increase unless they burn out and fail. As you might expect, they become extremely hot doing their line-short-circuit job and may sacrifice themselves to clamp a single large surge or may remain functional after several small surges.

Ham Site Of The Month

Send Site Suggestions: DRC.EDITOR@GMAIL.COM :)

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

The RoundTable Archive

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

The RoundTable Article Index

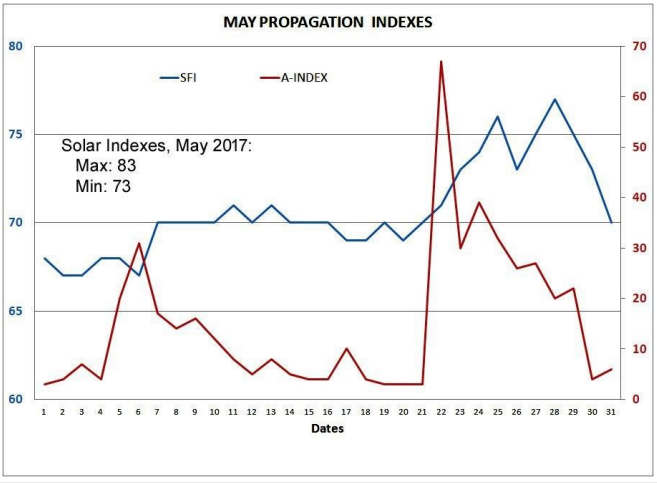
Go to: http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf

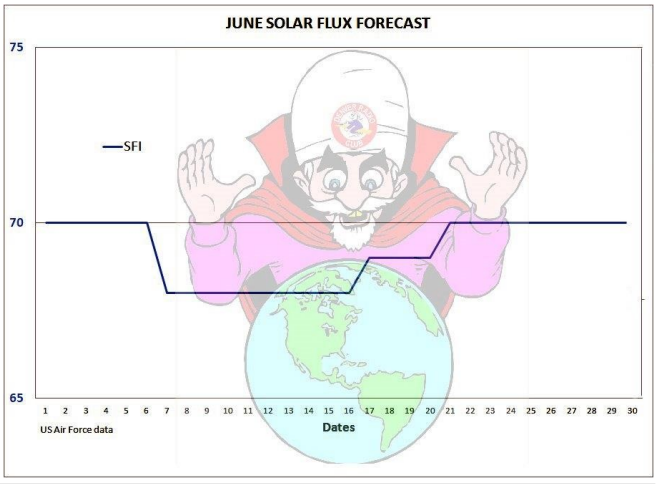
Past & Future Propagation Conditions

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





Upcoming Events
Hamfests & Conventions

Event	Date	Location	Sponsor Website
MARC Tailgate Party	06/02/18	Lions Club Pavillion (Delta, CO)	Montrose ARC
Pikes Peak RAA's 48th Annual Megafest	07/07/18	Lewis-Palmer High School	Pikes Peak Radio Amateur Association

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
Kentucky	06/02/2018	06/03/2018	Paducah Amateur Radio Association	
West Virginia	06/16/2018	06/17/2018	West Virginia State Amateur Radio Council	Based on 2017 date.
Maryland-DC	08/11/2018	08/12/2018	Anne Arundel Radio Club	
Kansas	08/25/2018	08/26/2018	Kansas QSO Party	
Ohio	08/25/2018	08/26/2018	Ohio QSO Party	
Hawaii	08/25/2018	08/27/2018	Hawaii QSO Party	Based on 2017 date.
Colorado	09/01/2018	09/02/2018	Pikes Peak Radio Amateur Association	Based on 2017 date.
Alabama	09/01/2018	09/02/2018	Alabama QSO Party	
Tennessee	09/02/2018	09/03/2018	Tennessee QSO Party	Based on 2017 date.
Iowa	09/15/2018	09/16/2018	Story County ARC	
New Hampshire	09/15/2018	09/16/2018	Port City Amateur Radio Club	Based on 2017 date.
New Jersey	09/15/2018	09/16/2018	New Jersey QSO Party	Based on 2017 date.
Washington	09/15/2018	09/16/2018	Western Washington DX Club	
Maine	09/22/2018	09/23/2018	Wireless Society of Southern Maine	
Texas	09/29/2018	09/30/2018	Texas QSO Party	
California	10/06/2018	10/07/2018	California QSO Party	

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**

JUNE 2018

DRC Net Sundays at 8:30 p.m. on 145.490 / 448.625 (no PL)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL) Last Quarter	7	8	9 **June VHF -** Begins 1800 UTC
10	11 **June VHF -** Ends 0259 UTC	12	13 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL) New Moon	14 	15	16 **Kids Day** - Begins 1800 UTC, ends 2359 UTC
17 	18	19	20 **DRC Meeting** Elmer 6 PM General 7 PM First Quarter	21	22	23 **Field Day** - Begins 1800 UTC
24 **Field Day** - Ends 2059 UTC	25	26	27 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	28 Full Moon	29	30

DRC Board of Directors

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TSA Coordinator	KA0BBQ	Barry Wilson	*Check Roster*	ka0bbq@arrl.net
VE Team	KC2CAG	Tom Kocialski	720-284-1911	kc2cag@arrl.net
Web Master	N0LAJ	Bill Hester	*Check Roster*	*Check Roster*

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…

Editor's Note

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