ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917 *100 years of amateur radio in Colorado* **May 2017**

President's Message

By Gerry Villhauer, W0GV

Hello DRC Members,

Last month I commented on the plans for moving the Brandmeister DMR Repeater to its new location on the Centennial Cone. A lot has happened since last month and I want to bring you up to date on the progress. Our antenna crew installed a brand new 4 bay Sinclair antenna on the tower. We were fortunate that there was a run of serviceable hard line cable already in place which saved us a lot of labor and expense. At another time, a microwave link was installed on the tower to bring internet service from another location to our site. Thanks to our friends at RMHam Radio for providing this valuable service for our use. The actual move of the repeater is estimated to be complete in the first part of May after some cleaning and checks are made to the repeater system. I will advise on the Sunday net when this is completed. Thank you to all who helped with the installation work.

Thanks to Allen Bishop for his presentation and still demonstration on Unmanned Aircraft Systems (UAS) at our April meeting. His presentation drew lots of questions, which is always a marker for a well done and interesting presentation. Thanks to our Vice President Dave (K0HTX) for taking over the duties while I was out of town.

Have you heard about the digital HF Modes called JT65 and JT9? These two modes appear to be the hot ticket for worldwide HF communication with very modest antennas and very low power. This mode makes worldwide communications possible for folks with antenna restrictions and similar problems of having a large HF antenna. And lots of hams that do have adequate HF antennas are getting active with this very interesting mode of digital communications. Like it or not, digital is the way the world is going in everything including ham radio. Bill Thomas (WB9KPT) says he has made over 1000 contacts using these modes over the last few years. Bill will be our presenter at the May meeting and will be explaining the software, how to sequence messages, monitoring and tricks to make this mode more effective and fun. He will also have some recorded QSO's to demonstrate. Mark your calendars for May 17th so you won't miss learning all about JT65 and JT9.

Thanks to all of you who recently joined and made the DRC "Your Club". Please stay active on the air, come to meetings, programs and events. Your name and call will be listed in the body of the Round Table.

73 for now,

Gerry
W0GV
President

Inside This Issue

April Meeting – What'd I Miss?

By Brennan Pate, AD0UZ

April's meeting was jam-packed with information. Dave (K0HTX) started the meeting off by greeting everyone and then presenting a slide show about the recent DMR repeater antenna installation that a few of the guys completed. The day-long project was quickly put together when the weather was good. Fortunately, the wind was not terrible and the guys had a successful trip. Drone footage was shown as well. It provided a nice perspective on what all was going on.

Next, Allen Bishop (K0ARK) gave a presentation about drones in general and the specialized ones that his company, Reference Technologies, makes. His company produces a drone that holds the world record (multi-rotor) for the largest payload. Allen provided examples of drone capabilities, talked about the type of clients that use drones, and future possibilities. Some examples of current uses for drones include: fire watch, fire-crew monitoring and organization, crime scene aerial photography, infrared / night work, surveying with LIDAR, wildlife counts, inspecting bridges, powerlines and spillways, avalanche management (instead of howitzers), and completing snow pack measurements. Examples of the capabilities: 300-mile range (GPS settings for the route, as opposed to RF control), they can fly at 2000 - 3000' AGL (above ground level), for up to 6 hours with a 60-pound payload, and 8 hours with a 20-pound payload. There were a few examples of drones available to look over, including a larger model. After the presentation was finished there was a lengthy Q & A session and time to look over several examples of drones.

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:

CB Williams	AA0KL	Greg Smith	W0GAS
Rebecca Campbell	KD0AOE	Jonathan Barrott	AA0AF
Eric Smith	N2ES	Patrick Surrena	KE0MYP
Melanie Anderson	KE0JZO	William Treadaway	NB0P
Chad Power	KC0WWW		

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 April Technical Committee meeting. The project coordinators' call signs are in red.

DRC TRBO Upgrade to BrandMeister (K0HTX)
Goal: Monitor and "fine tune' the new BrandMeister repeater.
Status: The repeater is working well! The Tech Committee is monitoring and requesting reports if any issues occur. N0LAJ has created a nice BrandMeister page. Sample code plugs for the MD-380 and CS-750 are available on that page. The Tech Committee is investigating the best way to handle including Motorola code plugs as most users do not have the programming software.

AllStar Link Voter System (W0GV)
Goal: Establish an AllStar Link Voter network on 147.33.
Status: Four remote receiver sites are now on line and working well. The Tech Committee is requesting reports if any issues occur.

AllStar Link Voter System (W0GV)
Goal: Locate possible remote sites.
Status: W0GV is looking for possible sites. W6OAV will develop propagation coverage maps to determine if the possible sites will fill in the 147.33 transmitter's "dead spots".

DRC/TSA Aurora Site (W0GV)
Goal: Maintain contact with TSA relative to establishing a "communications room" for the DRC.
Status: Several club members met with a TSA rep and inventoried the club's equipment. The members were also given a tour of the facilities.

Redesign Packet Gateway (W6OAV)
Goal: Replace the KAM and the TS-430, which perform marginally in the high power line noise at Site 4.
Status: This project is now on hold while HF propagation is monitored. As Solar Cycle 24 declines, propagation is becoming poorer. With the current marginal propagation, the HF packet network has become almost useless. The propagation forecast for the next few years is extremely poor.

Fusion Repeater Upgrade (AC0UA)
Goal: Equip the Fusion repeater with a Wires-X Link unit to connect it to the Wires network.
Status: AC0UA has tested the Wires X interface at home and will install it at Station 4 time permitting.

DRC TRBO Move (K0HTX)
Goal: Move the TRBO repeater to Centennial Cone to provide better coverage.
Status: CCARC approval has been obtained. The antenna installation and testing was completed on April 15th. The repeater will be relocated after a microwave link providing Internet access to the BrandMeister network is completed.

Station 4 Remote Power Control (K0HTX)
Goal: Investigate purchasing and installing Internet controlled power outlets.
Status: K0HTX will determine which pieces of equipment need remote power control and determine the best unit(s) to purchase.

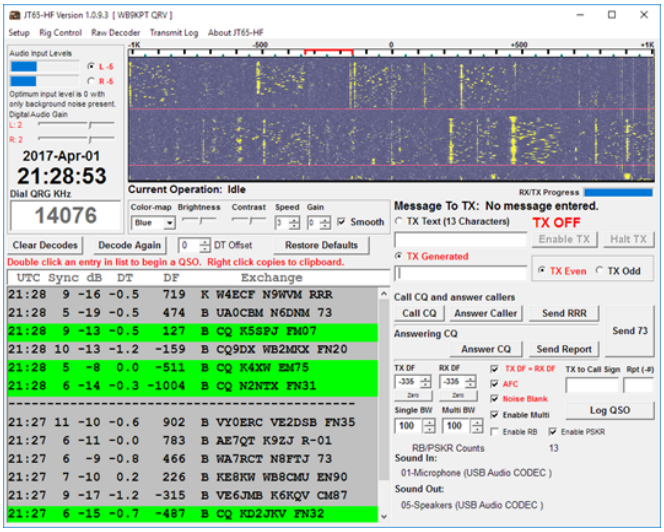
May Meeting Announcement

By Bill Thomas, WB9KPT

Digital communications modes are becoming more popular for ham radio operators. With HOA CC&R restrictions, many operators are finding that they must use stealth antenna and low power on the HF bands. Using JT65 and related modes, it's possible to work the world on modest antennas with barefoot rigs.

This presentation will cover the basic topics that will help you set up your station, load the necessary software and make your first contacts. This includes the following topics: what is JT65, computer to rig interfaces, JT65 software, time sync software, proper message sequence for a contact, monitoring your transmissions, a recorded demo of a few contacts and some operating tricks. A handout will be available that lists all the websites and download locations for the necessary software.

WB9KPT, Bill Thomas, has been licensed since 1968 and recently upgraded to the Extra Class license. Over the past 7 years he has made more than 1000 JT65 / JT9 contacts operating from a HOA community in PA, and now from Evergreen, CO.



EmComm Note

By Brennan Pate, AD0UZ

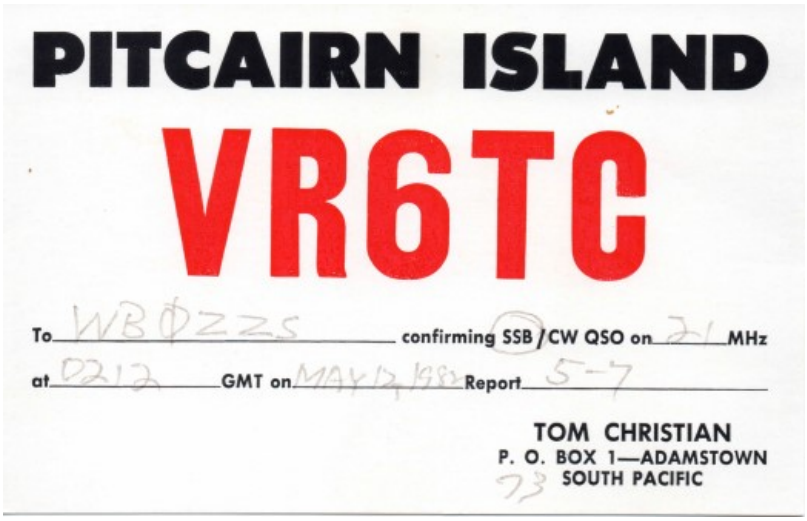
As previously mentioned, the annual siren tests in Wheat Ridge and Lakewood are being combined into a single test day on May 10th starting at 11 AM. Since the tests will be on the same day we will need a greater number of participants (45) than usual. We have made calls to everyone in the club and have gathered enough participants but we would still like to have some hams in reserve in case we run into any last-minute problems. If you have not participated in past tests and would like to join someone at a site, to see how it all works, that would be welcomed as well. Pizza and soft drinks will be provided after the test.

If you would like to assist with the test, please call Brennan (AD0UZ, 303-578-6283) or shoot us an email (emcomm@w0tx.org) and let us know if you would be available on that day. We will get you on our list and keep everyone updated as we get assignments coordinated and hear more from the Wheat Ridge and Lakewood officials.

Calling all QSLs…

By Brennan Pate, AD0UZ

This month's QSL card was provided by Gary (NV0S). He received it in 1982, under his old call (WB0ZZS), from Tom. Gary doesn't believe there are any resident hams on Pitcairn Island anymore.


PITCAIRN ISLAND

VR6TC

To WB0ZZS confirming SSB / CW QSO on 21 MHz

at 0212 GMT on MAY 12, 1982 Report 5-7

TOM CHRISTIAN
P. O. BOX 1—ADAMSTOWN
SOUTH PACIFIC

73

If you would like to have your QSL card featured in an upcoming edition of the Roundtable please send a copy of it (PDF or JPG, etc.) to drc.editor@gmail.com.

Alternatively, if you have received a unusual or exotic one in the past and would like to share it, then send it on over.

Learning Net Report

By Fred Hart, AA0JK

Thanks goes out to our Net controllers:
KØLAI Larry, W2PBR Alex, and KDØWMO Steve.

Topics discussed this past month:

Antenna gain, what is it, and its benefits.

Fire in the shack, or in your mobile. How to choose an appropriate extinguisher, and its use.

Solar propagation. Current HF band conditions.

Yasui HT setting problems and how to correct them.

Club meeting first hour:
KØLAI, Larry, demonstrated how to make that first QSO.

Newly licensed hams in attendance, got to participate in and learn the best ways to program their new handheld radios and make that first contact.

A lot of questions on how best to learn and use CW were answered for those wanting to learn Morse Code.

Mini 60 antenna analyzer
http://www.eham.net/reviews/detail/11993

Homebrew Zepp end-fed antenna.

Great topics from our group. We certainly enjoy everyone's participation. Thanks to all.
If you are listening and don't yet have your license, you can contact us at the W0TX web-site w0tx@w0tx.org. Also elmer@w0tx.org.

If we don't have the answer 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 & 449.350.
(Note: The third Wednesday of the month is devoted to the DRC club meeting. See the W0TX web site for additional information. Or, email: w0tx@w0tx.org),

73,

Fred
AA0JK

Don't forget to join in on Wednesday nights at 7:30 p.m. for the DRC Learning Net on the 145.49/448.625 (no PL) repeaters!

The DRC BrandMeister Relocation Has Begun

Project Overview

By Bill Rinker, W6OAV

The relocation project consists of three phases. Phase 1 is the installation of the antenna on the Centennial Cone tower. Phase 2 is the installation of the microwave link from Centennial Cone to an Internet access point in town. This link will provide Internet access to the BrandMeister network. Phase 3 is relocating the repeater to Centennial Cone.

Phase 1 was completed on April 15th. The installation went smoothly. Testing showed the new antenna's SWR to be 1.2 to1. When the 448.625 repeater was temporary connected to the antenna good signal reports were received.

The tower crew consisted of Robert (N0CFM), Dave (K0HTX), Jason (AC0UA) and Orlen (WW0LF). The ground crew consisted of Orlen (WW0LF) and Zach (KD0SGF). Tracy (KI0HC) documented the project with drone videos and pictures, four of which are with this article.

Figure 1 shows the 150' tower looking west. Three of the tower crew are shown installing the new antenna on the cross arm at the 120' level. Figure 2 shows the tower crew. Left to right in the front are Robert and Dave. Left to right in the rear are Jason and Orlen. Figure 3 shows Robert out on the end of the cross arm. He looks pretty calm considering this was his first high tower climb! Figure 4 shows the tower crew at work and provides an idea of the crew's view.

Figure 1 - Our Tower Crew at Work

Figure 2 - The Tower Crew

Figure 3 - NØCFM "Relaxing" on the Tower

Figure 4 - The Tower Crew's View

(Continued on page 7)

(Continued from page 6)

Description of Phase 1 Activities

By Dave Gillespie, K0HTX

A little bit of what went on to install an antenna on a tower like this.

Before even going to the site we checked the weather forecast. The forecast was for mid 50s and light wind so we went for it. When we got to the site we talked about what each of us would be doing so everyone involved would have a clear idea of what would be happening.

I walked around the site and looked at things like the guy line to make sure everything was as it should be. I wasn't expecting to find anything wrong but it makes me feel better to look everything over. The climbers then got their gear on: safety harness, hard hat, gloves etc. We held a safety meeting and checked that everyone had an operational radio on the same frequency.

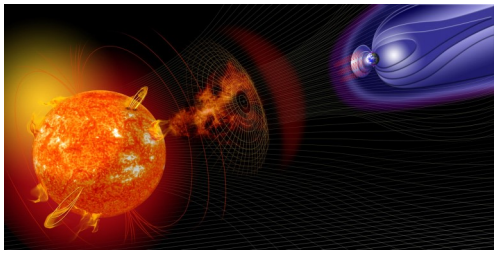
Jason started the long climb taking a long thin rope with him that would later be used to haul up the larger rope and tools. Two other climbers followed and we got to where we needed to be. A leftover pipe needed to be removed from where we wanted to put the antenna. After that Jason went up one more level to install a pulley on the arm above us. The larger rope used to pull up the antenna would be run through that pulley and back down to the ground. Orlen connected the antenna with a rope on top and bottom so that he and Zach could pull it up and keep it from swinging into the tower or one of the guy lines. The wind of course picked up a little more than we had hoped about the time the antenna left the ground. Robert who had been out on the end of the arm for about two hours at this point got the antenna in place and clamped. The antenna was connected to the 7/8" hard line and tested by the ground crew for SWR. Everything checked good so we lowered down the tools, ropes etc. and started down the tower.

We had a good group of people on this project. Orlen (WW0LF), Jason (AC0UA), Zach (KD0SGF), Tracy (KI0HC), Robert (N0CFM) and Dave (K0HTX). I would also like to give some of the credit for the successful installation to Dave (WG0N) who was unable to make it on this trip due to the last minute schedule change. Dave has logged many hours on this and other towers in the past. Dave and Orlen with their lifetime of experience have taught me a lot and without that, this project would have been a lot harder. I would also like to thank Robert (N0CFM) for spending so much time out on the end of that arm so I didn't have to. All pictures and drone video were by Tracy, KI0HC. He did a great job as pilot and photographer. He also helped on the ground crew.

Dave
K0HTX

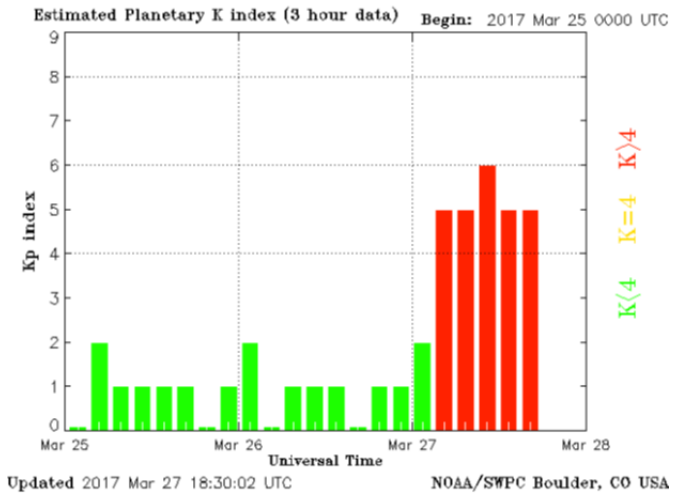
SOLAR UPDATE

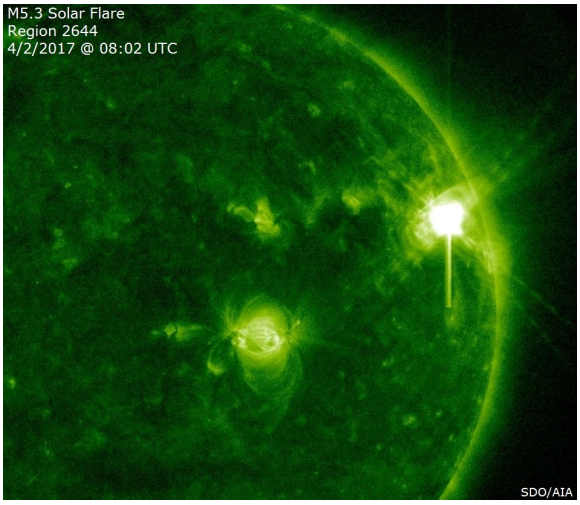
PROVIDED BY Fred Hart, AA0JK



Last days of March

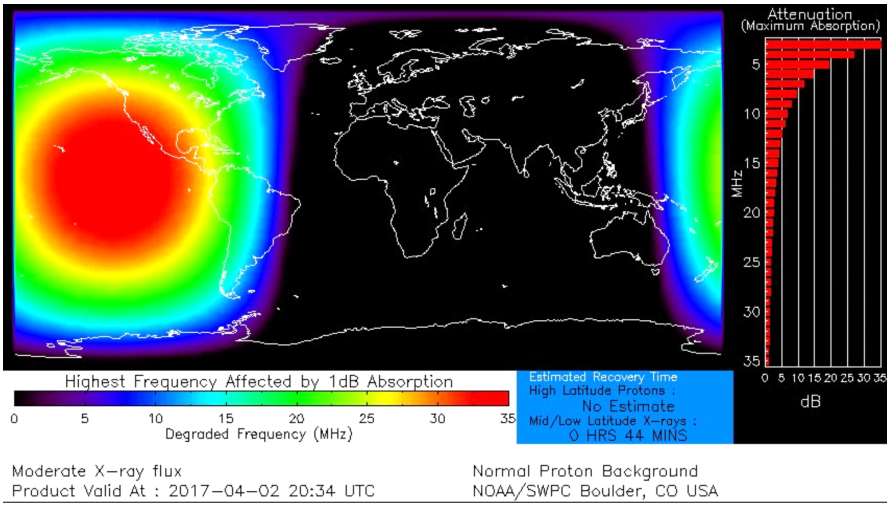
March 27th : Last Days of March left with high speed solar wind streams containing a sector of negative Bz, (A measure of North/South orientation of the magnetic field), reaching Earth. Moderate geomagnetic G2 level storming was observed reaching over Kp-6 levels. Solar Winds were high at 637.8 km/sec. X-ray flux levels were recorded at C5.18.





April Week One: As the Sun woke up, two active regions popped off C-class flares, resulting in HF issues affecting the Ham Bands and GPS operations. The Radio Communications Dashboard showed the D-Layer Region Absorption levels resulting in Radio Blackouts during the period.

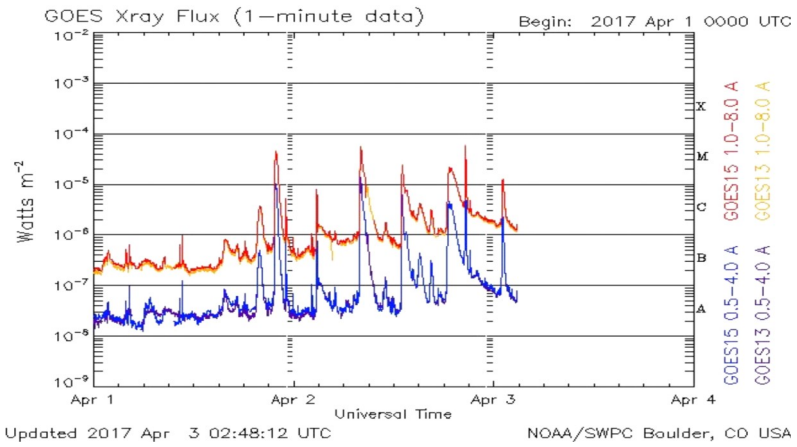
RADIO COMMUNICATIONS DASHBOARD: D REGION ABSORPTION



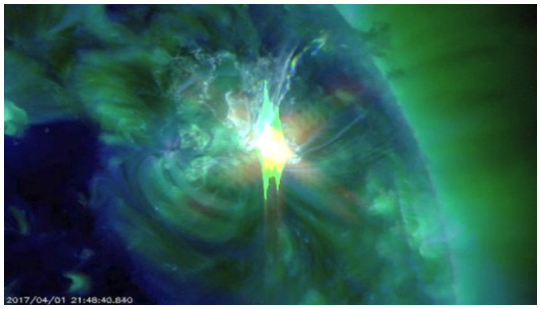
Continued from page 8)

Dr. Tamitha Skov reported a M5.7-flare. The fifth to fire off during a 24 hour period resulting in HF radio and GPS blackouts.

"Space Weather Solar Storm Alert" Rob Steenburgh tweeted, X-Ray Flux exceeded M5 levels on April 2nd.



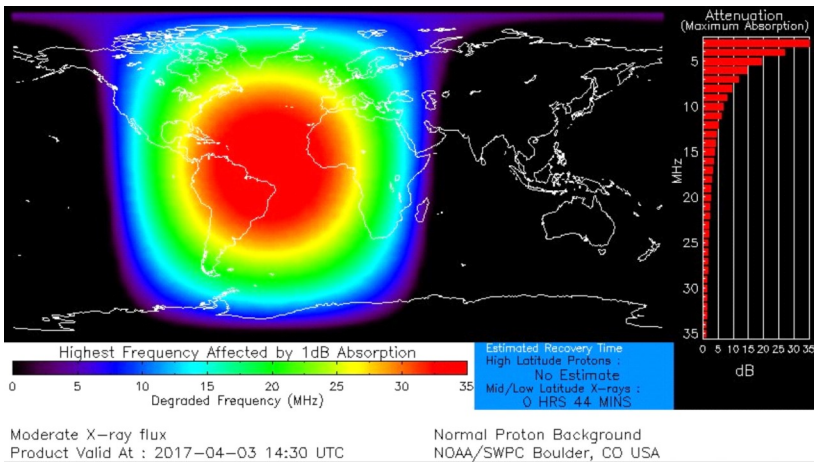
Monday, April 3rd: NOAA forecasters estimated a 60% chance of M-class solar flares and a 20% chance of X-class flares as sunspot AR2644 continued to crackle with magnetic explosions. Extreme UV radiation was causing shortwave radio blackouts, and other disturbances to normal transmission of radio signals around the globe.



Flashes of extreme ultraviolet radiation, like the one shown above, were ionizing Earth's upper atmosphere and altering the normal propagation of radio waves around our planet. There were at least three significant shortwave radio blackouts affecting, primarily, the Pacific and Indian oceans. People noticing these blackouts were ham radio operators and mariners using low-frequency rigs for communication at frequencies below 10 MHz.

http://www.spaceweather.com/images2017/02apr17/SunApril012017_1931UTmono21MHz_Ashcraft_01.mp3?PHPSESSID=7v6a99rofl0eiehr3mbc0ai351

Two sunspots, AR2644 and AR2645, possessed a threat of strong flares. Both were unstable delta-class magnetic fields that harbored energy potentials for M- and X-class explosions.



Tuesday, April 4th: Dr. Tamitha Slov reported a M5.8 flare. HF blackouts were expected in the HF amateur radio bands.

https://www.nasa.gov/feature/goddard/2017/nasa-s-solar-dynamics-observatory-captured-trio-of-solar-flares-April-2-3

(Continued on page 10)

Continued from page 9)

Week Two

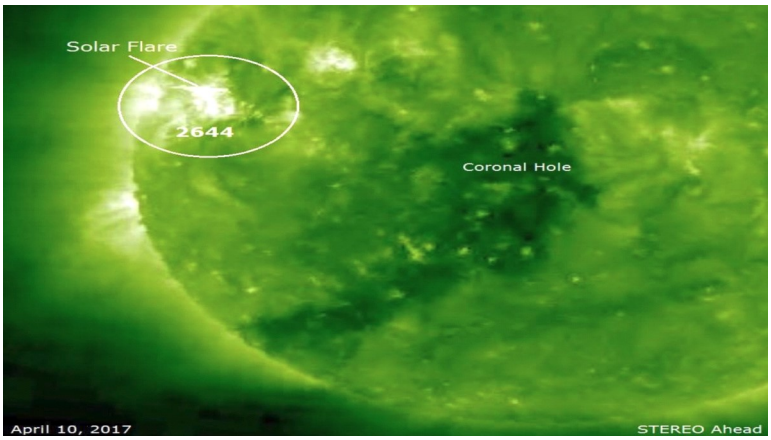
Solar Storms Can Drain Electrical Charge Above Earth: https://www.jpl.nasa.gov/news/news.php?feature=6804

Thursday, April 6th: Chance of flares subsiding. Activity from sunspot AR2644 unleashing a series of M-class explosions was subsiding as AR2244 rotated off the solar disk and no longer posed a threat for Earth-directed flares.

Seven big flares, means no sleeping sun yet. Tamitha Skov: https://youtu.be/Ft7kkuwichY

April 9th: Solar filament explodes, hurling a CME. As a dark filament of magnetism on the sun rose up it hurled a portion of itself into space.

April 13th: A hole in the sun's atmosphere, a coronal hole (CH), opened up and was spewing a stream of solar wind that was expected to brush against Earth's magnetic field.

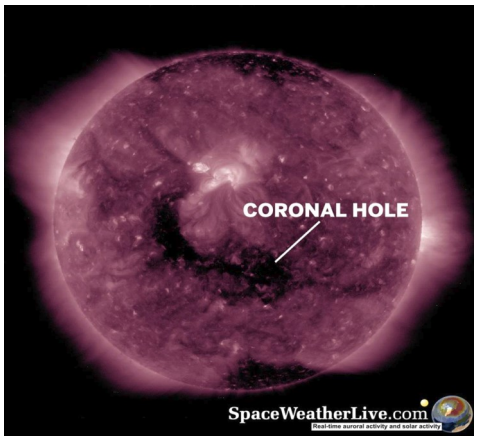


Flying debris from this filament formed the core of a coronal mass ejection (CME). At first it appeared that the CME would miss Earth, but a new analysis by NOAA forecasters suggested that a glancing blow was possible on April 14th. G1-class geomagnetic storms were possible when the expected CME was to arrive.

April 15th: **Coronal Hole / Storm Watch**
Coronal Hole #80 was expected to become geoeffective after April 16th. Minor (G1) geomagnetic storm conditions were possible once a high speed solar wind stream reached Earth.

Week Three

April 16th: A minor coronal hole located on the Sun's southern hemisphere was facing Earth. The NOAA SWPC was issuing a minor G1 geomagnetic storm watch for April17th, likely due to the anticipated arrival of the solar wind stream from this coronal hole.



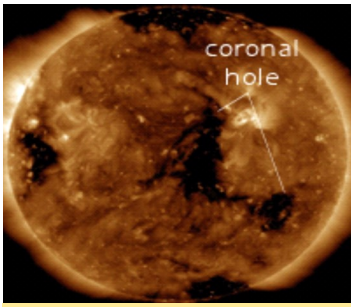
NOAA forecasters estimated a 15% chance of polar geomagnetic storms as the storm arrived, increasing to 55% as it fully enveloped our plant's magnetic field.

The remainder of the week, solar activity on the Earth facing side of the sun, remained quiet with no large sunspots visible. The backside of the sun however still had Sunspot 2544 kicking about and appeared to still be quite active. The remains of this active region will reappear off the east limb in about six days. Also noted was the large coronal hole responsible for a high speed solar wind stream and moderate geomagnetic storming

in March was still present and was expected to be turning into view in the following three days. This was potential for another round of excitement later in the month.

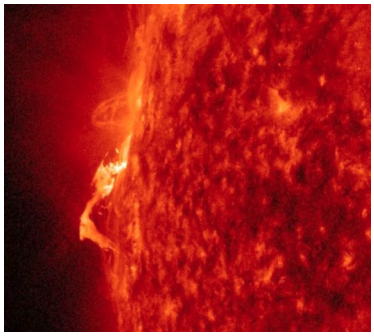
Monday, April 17th: The face of the Sun is blank. No sunspots.

SOLAR WIND STREAM APPROACHES EARTH: A hole opened in the sun's atmosphere and it was directly facing Earth.



Credit: NASA/SDO

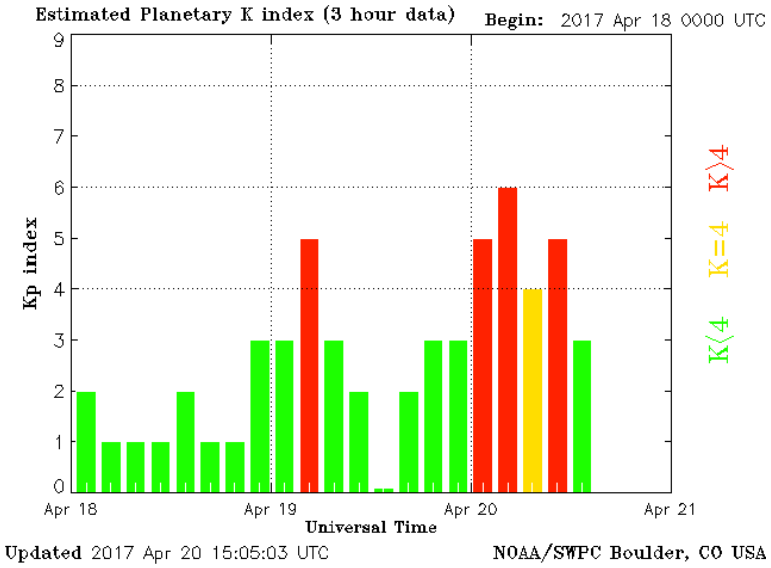
Solar wind flowing from the indicated coronal hole was expected to reach Earth on April 17-19.



April 18: ACTIVE SUNSPOT RETURNS - During the late hours of April 17th, an eruption hurled a plume of hot gas over the eastern limb of the sun. NASA's Solar Dynamics Observatory photographed the event.

The source of this activity was the return of sunspot AR2644. In early April the active region produced a series of M-class solar flares and HF radio blackouts. After a two week trip around the far side of the sun, AR2644 was returning. Solar flare activity was expected to increase sharply during the following days.

April 20:

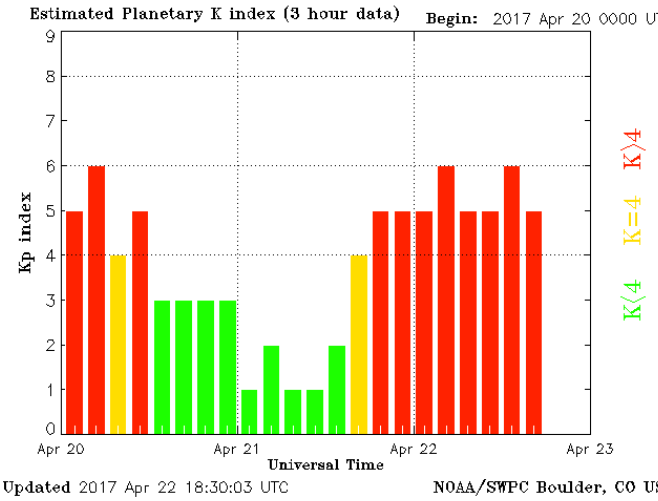


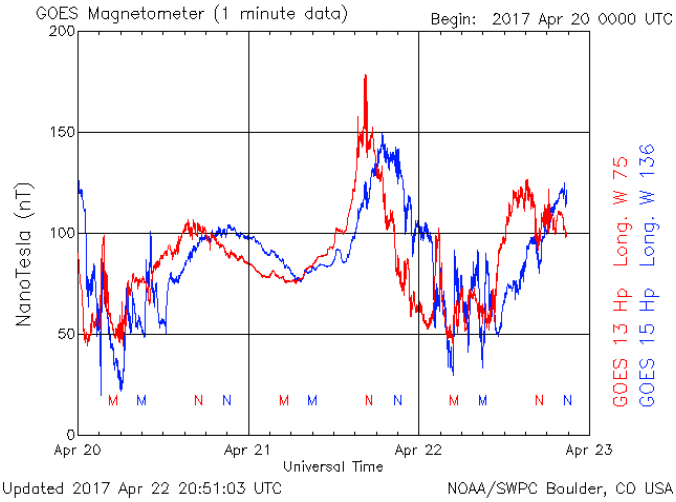
Spectacular CME erupts from AR2644. The sunspot's magnetic canopy exploded and hurled a bright CME into space. The Earth was entering a stream of high-speed solar wind on the 20th, causing G1 and G2 class geomagnetic storms around the polar caps. Disturbances to the HF bands were expected to continue until the 21st as our planet moved deeper into the solar wind stream. Radio blackouts were in the offing until geoeffectivity passed to the far-side of the sun. Then, the question is, will it return in two weeks for another round of solar activity?

Solar Activity: C5.5-Flare/CME, G2-Geomagnetic Storm: April 20th, 2017.
Video by Skyywatcher88: https://youtu.be/rO1Fr3SQ7Mw

April 20th: Angry Regions Are Here Again: Solar Storm 04-20-2017:
Video by Tamith Skov: https://youtu.be/JR7D9zTygao

(Continued on page 12)





Week Four

April 24th: Earth was inside an ongoing solar wind stream of near 700km/s. Geomagnetic storming was expected to persist for the remainder of the week.

Forecast: Solar activity was expected to be very low with a chance for C-class flare activity over the following few days.

73,

AA0JK
Fred

DRC 100th Anniversary Pins

By Gerry Villhauer, W0GV

Our 100th Anniversary Pins will be available at the regular meetings.

They are 1.5 inch in size and beautifully done. They are a real nice collector item to commemorate this important mile stone in the Denver Radio Club history. Cost is $3 for the first pin and $2 for the second.

~ Get Published ~

We welcome and encourage all members to share their experiences and stories so that we can all learn from one another. It can be long or short. If we can't fit it into one newsletter, we can split it across multiple issues.
Not a writer? We have volunteers that will listen to your story and put it into an article, and of course you will have the opportunity to review and approve prior to publication. Your contribution to the club is welcomed and appreciated. ~Editor

International Crystal Manufacturing Going Out of Business

Published by the ARRL, 03/10/2017

International Crystal Manufacturing (ICM) of Oklahoma City has announced that it will be going out of business, probably at the end of May. Royden Freeland Jr., W5EMH, son of the company's founder, posted a letter this week on the ICM website.

"We will be honoring all orders that we have already taken and will be able to fill a limited amount of new orders dependent upon raw materials available," Freeland said. "We would like to thank you for your past business. The success of ICM over the previous 66 years has been largely due to its amazing customer base."

International Crystal produces RF control devices — quartz crystals, oscillators, QCM crystals, filters, TCXOs/ VCTCXOs, and precision crystals.

Royden R. Freeland Sr. founded International Crystal in 1950, at first operating out of his garage. One of his first contracts was to produce crystals for Collins Radio. The elder Freeland and his wife died in a 1978 air crash, and his son took over the company, which expanded into the production of other electronics in the 1980s.

In the 1990s, though, it sold off some of its equipment and distribution business to concentrate on its core enterprise — the manufacture of crystal and oscillator products.

The announcement caught some manufacturers off guard, and they are seeking to source the products they had been buying from ICM, one of the few remaining US-based manufacturer of crystal products. Radio amateurs requiring crystals for projects or as replacement parts for older equipment also will have to look elsewhere.

Ironically, International boasts on its website that it's "a proud supplier to RadioShack," which, for the second time in 2 years, declared Chapter 11 bankruptcy this week.

http://www.arrl.org/news/international-crystal-manufacturing-going-out-of-business

Antenna Gain

Provided By Fred Hart, AA0JK

"What is Antenna Gain?" This is a very common question.

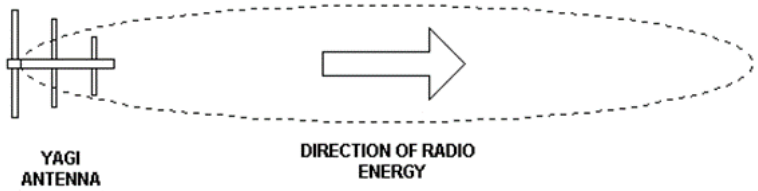
An antenna's power gain, or simply gain, is a key performance number which combines the antenna's directivity and electrical efficiency. As a transmitting antenna, the gain describes how well the antenna converts input power into radio waves (RF), headed in a specified direction. As a receiving antenna, the gain describes how well the antenna converts radio waves (RF), arriving from a specified direction, into electrical power. When no direction is specified, "gain" is understood to refer to the peak value of the gain. A plot of the gain as a function of direction is called the radiation pattern.

But gain itself is a tricky term to define, so we're going to explain it here a little more in depth.

One of the major parameters used in analyzing the performance of radio frequency (RF) communications links is the amount of transmitter power directed toward an RF receiver.

This power is derived from a combination of:

1. Transmitter power
2. The ability of the antenna(s) to direct that power toward an RF receiver(s)



(Continued on page 14)

The directivity of the antenna is determined by the antenna design. Directivity is the ability of an antenna to focus energy in a particular direction when transmitting, or to receive energy better from a particular direction when receiving. To determine the directivity of an antenna, we need a reference antenna with which to compare our antenna's performance.

Over the years there have been several different reference antennas used; however, today an isotropic radiator is preferred as the standard antenna for comparison. As noted, the isotropic antenna transmits equal amounts of power in all directions (like a light bulb).

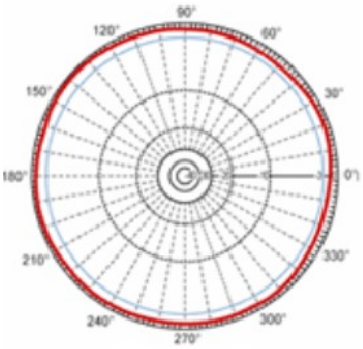
To increase the directivity of a bulb's light (the antenna's energy), similar to a flash light or automobile head lamp in this example, a reflector (antenna) is added behind the bulb. At a distance, in the light beam, the light bulb now appears to be much brighter. The amount that the bulb appears brighter compared to the bulb without a reflector is the directivity of the reflector (antenna).

When the directivity is converted to decibels we call it the antenna gain relative to an isotropic source (dBi). Typically the higher the gain, the more efficient the antenna's performance, and the farther the range of the antenna will operate. For every 6 dBi in gain, you double the range of the antenna.

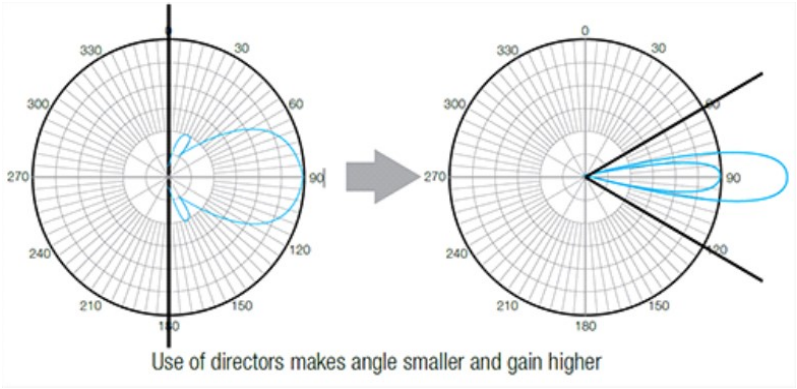
It should be noted that many issues need to be considered when selecting the "best" antenna for the application, and you should discuss any antenna selection with someone knowledgeable in RF radiation and antenna performance.

Antenna Gain: A relative measure of an antenna's ability to direct or concentrate radio frequency energy in a particular direction or pattern. The measurement is typically measured in dBi (decibels relative to an isotropic radiator) or in dBd (decibels relative to a dipole radiator).

Isotropic Radiator: is a theoretical single point in space that radiates energy equally in every direction similar to the Sun radiating its light. The isotropic radiator exhibits the same magnitude or properties when measured in all directions. It has no preferred direction of radiation. It radiates uniformly in all directions over a sphere centered on the source.



Omni-Directional: 360° Coverage



Directional: Focused Coverage

First of all, a db or two of difference in gain is basically irrelevant.

Gain is a number that some antenna sellers use more for marketing than for anything else.

An antenna is not an amplifier.

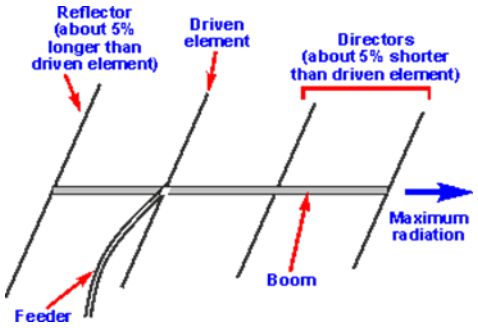
There is only a limited amount of electromagnetic energy coming by your antenna. The directional antenna has "gain" over a non-directional antenna but at a cost, it is just channeled in one direction. It can't receive as well in the other directions without being rotated. Remember that up and down are also directions pertaining to gain. We as ham radio operators usually want our radio's transmitted energy and its ability to receive others transmitted energy to be near the ground - especially on VHF and up. This refers to angle of radiation. Ground plane antennas

(Continued on page 15)

have a higher angle of radiation than a j-pole or vertical dipole because the ground radials are angled up from the vertical causing the RF energy to be angled up as well. Great if you are trying to transmit out of a valley or trying to skip off the upper atmosphere or maybe trying to transmit around the curvature of the Earth. For local communication or from a mountain top, you may not want to radiate as much energy upwards so a j-pole or di-pole or any Uda/Yagi antenna, might be the best choice.

What is Antenna Gain?: https://youtu.be/wGE4tjATecY

Gain (dBi) simply decreases in one direction to improve in another. There is no net increase overall.



73,

AA0JK
Fred

EMERGENCY COMMUNICATIONS TOP REASON FOR INCREASE IN LICENSEES

BY DAN ROMANCHIK, KB6NU

A recent article in the online version of Emergency Management points to emergency communications as one of the big reasons that "more Americans than ever" are now licensed radio amateurs. According to the ARRL, the number of amateur radio licensees hit 743,003 in November 2016.

Mike Corey, KI1U, the ARRL's Emergency Preparedness and Response Manager is quoted as saying:

> "There has been a tremendous amount of interest in emergency preparedness since 9/11 and Katrina, and this is true for the amateur radio community as well. Emergency communications is a gateway into amateur radio, and many join our ranks through an interest in being better prepared themselves and as a way to serve their community."

This is true. I'd say that the majority of people who take my one-day Tech classes do so to participate in some kind of public service or emergency communications. For example, students in my upcoming May 6 Tech class are involved with local CERT teams and there are a couple who are part of the Michigan Volunteer Defense Force, which, in a way, is Michigan's National Guard.

I find this kind of ironic. More people are getting licensed to participate in emergency communications at a time when amateur radio's role is being de-emphasized by many in emergency management.

I also wonder what kind of training these folks get after they get their licenses. It certainly takes more than a Technician license and a handheld to become an effective communicator. At the very least, I can see the need for two follow-on training classes:

1. Net operation and message handling. This should include lots of exercises. Locally, our Amateur Radio Public Service Corps (ARPSC), which is an amalgamation of the ARES and RACES groups, conducts a net every Sunday night, but all they do is check in. Every once in a while, they participate in simulated

(Continued on page 16)

emergency exercises. I never hear them practice message handling, and the more I think about it, I think that this is a vital skill that all emergency communicators should have.

2. Practical communications technology. Among other things, this class should cover:
   - the limitations of handhelds,
   - how to power radios out in the field,
   - how to install Anderson PowerPoles,
   - different kinds of antennas and how to connect them to your radios.

The ARRL offers a course, Introduction to Emergency Communication (EC-001), but it seems to me that this is way too much, too quickly for new Techs. And, on top of that, it costs 50 bucks! My "no nonsense" approach would be to break it down and feed it to the new Techs in smaller, simpler chunks.

I'm curious as to what you all think about this. Are you seeing that the majority of new hams are getting their licenses to participate in emergency communications? Are they getting any training after they get their licenses? What kind of training should they get?

Content from an April 13, 2017 blog post on Dan's KB6NU's Ham Radio Blog.

When he's not pondering questions about the amateur radio licensing structure, Dan blogs about amateur radio at KB6NU.Com, writes the "No Nonsense" amateur radio study guides, and teaches ham classes. You can contact him by e-mailing cwgeek@kb6nu.com.

HAM Podcasts

By Bill Rinker, W6OAV

There are many ham related podcasts available on the Internet. These podcasts cover about every aspect of ham radio. They are interesting and extremely informative.

So, what is a podcast? A podcast is a form of "audio broadcasting" over the Internet. A podcast is a digital audio file, usually an MP3. It can be played on a computer or any portable media device that can play music. A podcast can be either streamed or downloaded from the podcaster's website, from iTunes, or via iPhone and Android podcast apps. And, most podcasts are FREE!

One can subscribe to their favorite podcasts which will allow new podcasts to automatically be downloaded to their preferred device.

The following is a list of many ham podcast websites. This list is by no means complete. (Note: Many of these podcasts are also available via iTunes or smart phone podcast apps).

ICQ Amateur / Ham Radio Podcast - http://icqpodcast.com/
Practical Amateur Radio Podcast - http://myamateurradio.com/
Solder Smoke - http://soldersmoke.blogspot.com/
Radio Amateur Information Network - http://www.therainreport.com/rainreport.shtml
Linux Ham Shack - http://lhspodcast.info/
Ham 360 radio - http://hamradio360.com/
QSO Today - http://www.qsotoday.com/
100 Watts and a Wire - http://100wattsandawire.com/
ARRL Audio News - http://www.arrl.org/arrl-audio-news
DX Zone Podcast - http://www.dxzone.com/catalog/Internet_and_Radio/Podcast/
Resonant Frequency -http://rfpodcast.info/Podcast/
Ham Radio Now.tv - http://www.hamradionow.tv/
Amateur Radio Newsline - http://www.arnewsline.org/
The Doctor is in - http://www.arrl.org/doctor
Everything Hamradio- http://www.everythinghamradio.com/
Ham Talk Live - https://www.spreaker.com/show/ham-talk-live

So, download your favorite podcasts, sit back, relax and learn many interesting things!

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

Roundtable September 1960 - Elections

September, 1960

The Round Table

The Denver Radio Club, Inc.

ELECTION MEETING SET FOR SEPT. 21

The following eight members of the Denver Radio Club have been named by the Nominating Committee as candidates for the four openings on the board of Directors:

Chic Cotterell, WØSIN
Tillie Currington, KØRGU
Russ Hendrickson, KØEPD
Bernie Jacobs, WØMYB
Fontaine LaRue, WØRQI
Chet Lewis, KØKZJ
Roy Raney, KØOVQ
Norv Sample, KØIYC

The September meeting of the Denver Radio Club will be headlined by the annual election of the Board of Directors. In accordance with the by-laws of the club, four new directors must be selected for the eight-man board. Directors serve two-year terms, which are staggered so that only four memberships expire each year.

A nominating committee appointed by the president has presented a list of eight nominees for the four openings. Selection will be made by plurality vote of the members present at the September meeting. The list of candidates appears in the box at left. After selection of four members, officers will be elected.

Traditionally, the names of the out-going board members appear in the list of nominees. However, two of the out-going members have declined re-nomination. Mike Lyons, WØPG, and Ralph Asbury, WØVDY, both expressed a desire to step aside to allow room for "new blood" on the board.

Members of this year's nominating committee were Carl Smith, WØBWJ, Larry Hodgson, WØLO, and Frank Wallace, KØEBV.

Date of the meeting is September 21 at 7:30 p.m. Meeting place is Sabin Hall of Colorado General Hospital as usual. Refreshments will be served after the meeting.

Ø——Ø——Ø

Deadline for **The Round Table** is the day preceding the first Thursday of each month. All advertising and copy **must** be in by that time.

NEW CODE OSCILLATOR AVAILABLE TO GROUPS

The Denver Radio Club has acquired a large code practice machine which uses inked tapes. Designed for large group instruction, the machine is being made available to any group of five or more people who wish to learn or practice the code.

Frank Vail, KØHFO, has offered to organize the first group. Sessions will be held at his home at 1472 Madison St. at any time convenient to the participants. Interested parties are invited to call Frank at FR. 7-1534.

Editors Note: The current collection of crossword puzzles has been used. This is a trial run on a different puzzle type. Words will come from the Technician, General and Extra license manuals. Please let me know what you think: drc.editor@gmail.com. The solution for the puzzle is on the next page.

H T A C T I C A L T G G I O

I R F K D R A M A R N L E O

E E E E I A R A I I I A F T

S D S P P Q I D P C M F I P

I A A L O N E P E P S N A T

O E F E L E I N E E E C O T

N H E R E L S R T R K R O N

E K T I C E E N V E L O P E

O E Y A E B A T T E R I E S

Q E R N R O T A L U S N I N

D A E H N E D I A M E I I N

A T W A V E L E N G T H G V

S E E N I L D E E F R D A H

R E C E I V E R A F H U Y F

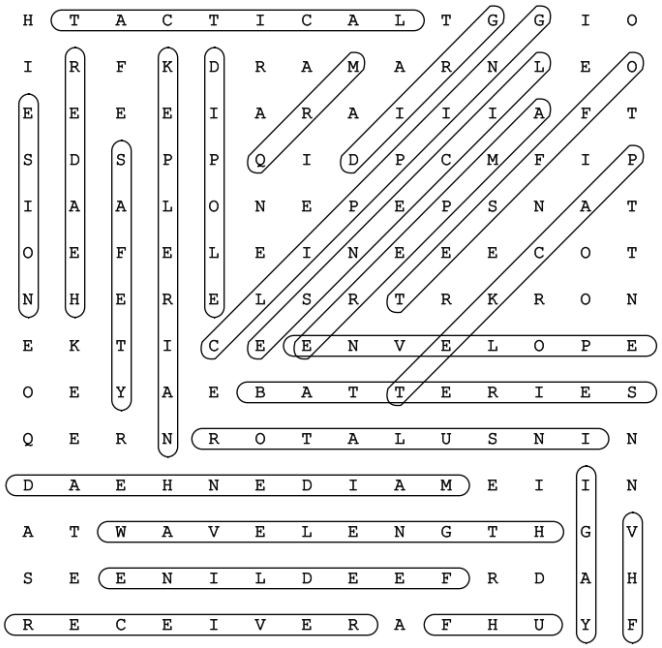
Word List:

AMPERE
BATTERIES
CLIPPING
DIPOLE
ENVELOPE
FEEDLINE
GRID
HEADER
INSULATOR
KEPLERIAN
LICENSE
MAIDENHEAD
NOISE
OFFSET
PACKET
QRM
RECEIVER
SAFETY
TACTICAL
UHF
VHF
WAVELENGTH
YAGI

Fact of the Day

Folded Unipole Mounting Advantages

It is necessary to insulate the bottom of a base-fed tower. There are several problems associated with that. 1) An insulator must be used below each leg of most self-supporting towers. 2) Base insulators must be strong, because they have to support the weight, side-thrust, twisting, leaning and mechanical vibrations of a tower. 3) Insulators that meet those requirements are relatively expensive. 4) If a base insulator fails mechanically, a tower may fall. 5) Broken base insulators can be difficult to replace. 6) Lightning strike and induction currents do not have the shortest or safest possible path to ground. The folded unipole alternative greatly reduces these problems, because one of the two adjacent conductors connects directly to ground. That can be the supporting member (a tower). The folded member must be insulated from the tower, but it can be composed of wires that are easy to insulate and support. ©2005 *Martek International All rights reserved.*



Ham Site Of The Month

W0TX BrandMeister

The RoundTable Archive

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

The RoundTable Article Index

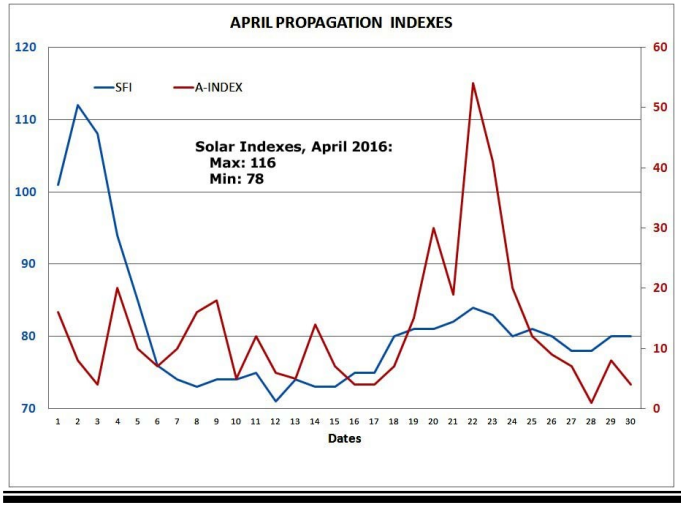
Go to: http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf

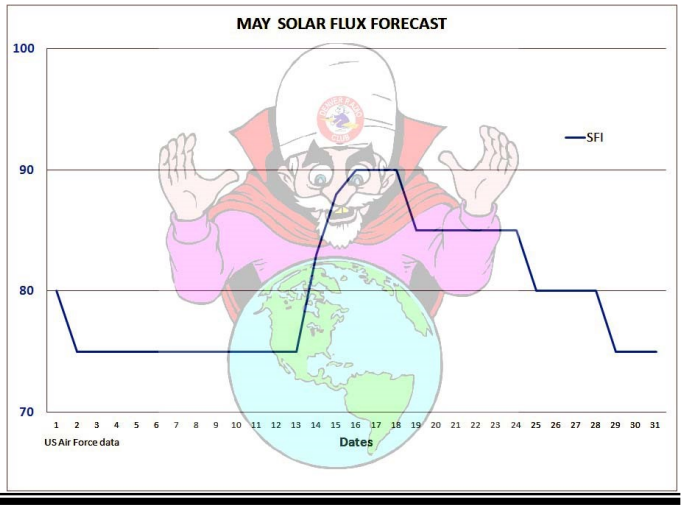
Past & Future Propagation Conditions

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





Upcoming Events
Hamfests & Conventions

Event	Date	Location	Sponsor Website
Montrose ARC Tailgate Party	06/03/17	Confluence Park, Delta, CO	Montrose Amateur Radio Club

Upcoming ARRL Contests & Events ARRL Contest Calendar

Contest	Start Date	Start Time	End Date	Stop Time	Notes
June VHF	06/10/17	1800 UTC	06/12/17	0259 UTC	
Kids Day	06/18/17	1800 UTC	06/18/17	2359 UTC	
Field Day	06/24/17	1800 UTC	06/25/17	2059 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
Alabama	06/03/2017	06/04/2017	Alabama QSO Party	
West Virginia	06/17/2017	06/18/2017	West Virginia State Amateur Radio Council	Based on 2016 date
Maryland-DC	08/12/2017	08/13/2017	Anne Arundel Radio Club	
Hawaii	08/26/2017	08/28/2017	Hawaii QSO Party	Based on 2016 date
Kansas	08/26/2017	08/27/2017	Kansas QSO Party	
Ohio	08/26/2017	08/27/2017	Ohio 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, Members Auto-Patch. 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

MAY 2017

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

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2  First Quarter	3 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	4	5	6
7	8	9	10 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)  Full Moon	11	12	13
14	15	16	17 **DRC Meeting** Elmer 6 PM General 7 PM	18  Last Quarter	19	20
21	22	23	24 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	25  New Moon	26	27
28	29	30	31 **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)			

DRC Board of Directors

President	W0GV	Gerry Villhauer	303-467-0223	w0gv@hotmail.com
Vice-President	K0HTX	Dave Gillespie	303-795-8225	k0htx@comcast.net
Secretary	WW0LF	Orlen Wolf	303-279-6264	owolf@mines.edu
Treasurer	K0TOR	Jim Beall	303-798-2351	k0tor@arrl.net
Board Member	AC0UA	Jason Smallwood	*Check Roster*	*Check Roster*
Board Member	WY0J	Jan Alan Dickover	303-697-0725	jad.wy0j@gmail.com
Board Member	AD0GX	Kevin Schmidt	720-641-5920	kschmidt@westmetrofire.org
Board Member	WG0N	Dave Baysinger	303-987-0246	wg0n@arrl.net

DRC Staff and Volunteers

Benevolent		Carolyn Wolf	303-330-0721	Contact owolf@mines.edu
Club Librarian	WG0N	Dave Baysinger	303-987-0246	wg0n@arrl.net
Education	AA0JK	Fred Hart	303-420-3536	elmer@w0tx.org
EmComm Coordinator	KE0HFH	Michael Vespoli	303-215-8862	mvespoli@gmail.com
EmComm Coordinator	AD0UZ	Brennan Pate	303-578-6283	ad0uz@outlook.com
Field Day	AC0UA	Jason Smallwood	*Check Roster*	sjason67@msn.com
Membership	KC0CZ	Bob Willson	303-659-0517	rwillso2@centurylink.net
Net Control	K0TOR	Jim Beall	303-798-2351	k0tor@arrl.net
Public Relations	N0USN	James Fariello	303-659-3319	jamesfariello@gmail.com
RT Managing Editor	AD0UZ	Brennan Pate	303-578-6283	drc.editor@gmail.com
RT Associate Editor	W6OAV	Bill Rinker	*Check Roster*	*Check Roster*
Swapfest Manager	AC0UA	Jason Smallwood	*Check Roster*	sjason67@msn.com
Tech. Committee Chair	W6OAV	Bill Rinker	*Check Roster*	*Check Roster*
Trustee	WW0LF	Orlen Wolf	303-279-6264	owolf@mines.edu
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