

Sunday August 28, 2022- Adams County Fairgrounds
**DENVER RADIO CLUB
HAMFEST**



NOTE: NEW PLACE AND DATE!!!

Adams County Fairgrounds

9755 Henderson Road in Brighton

Sunday August 28, 2022

9:00 am – 1:00 pm

\$6.00 Admission

(Children under 13 free w/adult)

Exact Change appreciated

Doors open to the Public at 9am

Six-foot tables Advance Purchase..... \$13.00 each

Tables at the Door..... \$20.00

No guarantee of availability of "at the door" tables!

Vendor Setup begins at 7:30 on August 28th

Table assignment will be available at check-in

License Testing/VE Exams at 10 am

Talk-In: 145.490 or 448.625 PL 100.0Hz

GPS: Lat 39d 43' 19" N Lon 105d 10' 15" W

Handicapped Parking & Access Available

Visit our website for table reservations or email our hamfest manager Cathy Villhauer at drcfest@w0tx.org



THE ROUND TABLE

Monthly Newsletter Of The Denver Radio Club

Since 1917

April 2022

PRESIDENT'S MESSAGE

BY GERRY VILLHAUER, W0GV

Hello DRC Members,

The weather has been a mixed bag in March. It is sure nice to see the milder temperatures coming our way in April.

Finally, we were able to secure a location for our DRC Hamfest. As most of you know, no thanks to the Jefferson County Commissioners, we are no longer allowed to reserve the Jeffco Fairgrounds for our annual event. I am happy to say, we will have our Hamfest at the Adams County Fairgrounds, in Henderson. The date will be August 28, 2022. Our website will be up soon for table reservations via PayPal or by check. You can view our flyer for information on the DRC website: w0tx.org/hamfest.htm.

The other good news...Field Day 2022. The date is June 25-26, 2022. The location, same as last year; Prospect Arena-13805 West 52nd Ave. Arvada. More information will be forthcoming. We will need volunteers to help set up and tear down...So, mark your calendars now and plan to come enjoy a FUN Ham Radio Weekend!

Thanks to Jim Andrew (KH6HTV) for a very interesting and informative presentation on Amateur Television. I believe there is nothing at all that Jim does not know about ATV. I have heard chatter about the program and that at least one of our members recently made his first ATV contact. Great Job Jim!

Our April program will be equally interesting. John Ackermann (N8UR) will be telling and showing us all about "SatNav". You most likely use it nearly daily in your vehicle and other places to tell where you are and where you are going. Join our April 20th meeting and learn how "SatNav" really works. Mark your calendar for April 20, 2022.

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

73 for now,

Gerry
W0GV
President



WHO'S NEW IN THE DRC?

BY BOB WILLSON, KC0CZ

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

Jeffrey Millard - KD8FGA	-	Richard Budinger - WA9IPK
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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.

LEARNING NET REPORT

BY FRED HART, AA0JK

Purpose:

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

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

Topics of interest we encourage:

Personal Communications

- Getting started in the various modes, of communications.

Emergency communications

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

Radio electronics, and technology

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



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

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

March topics we discussed:

- Amateur Radio Operators Seeking Exemption from Proposed US Forest Service Communication Facility Fees: [regulations.gov/comment/FS-2022-0001-0749](https://www.regulations.gov/comment/FS-2022-0001-0749)
- ARRL Seeks Exemption from Proposed US Forest Service Communication Facility Fees; Comment Period to be Re-Opened.
- Make Amateur Radio Your Own - ARRL Learning Center
- Antenna coax link, shack to your outdoor antenna. Commercial and home-brew window pass-through panel.
- Dipole Antenna, Static Electricity: youtu.be/1bDPWGUfwlY

- Hi-definition digital TV.
- Letter from Senator Michael F. Bennet concerning US Forest Service Communication Facility Fee.
- Amateur Radio Today – Walter Cronkite – KB2GSD - youtu.be/y2r1Y9tIia0
- NOAA scheduled outages for maintenance and upgrades.
- ARRL's scheduled outage for implementing new web-page.
- Home-brew loop antenna in apartment.
- Home-brew Go-Box

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, 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.

Getting that first Technician license? Upgrading to General or Extra? We're here to help.

You may also find Dave Casler's Amateur Radio Licensing Guides helpful: <https://dcasler.com/ham-radio/>

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

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



arrl.org/public-service

Use your communication skills to help keep your community safe!



weather.gov/marine/ham

warrenares.org/home/skywarn-weather-spotting

SKYWARN Spotter Training Updates: weather.gov/bou/spot_training



During severe weather events, amateur radio operators bring significant resources to storm spotting,

including an established communications system that can function in an emergency. They provide real-time information to partners like emergency management and forecasters at the national weather service. The data received from hams helps issue weather watches, warnings, and advisories.

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

73,

Fred
AA0JK
elmer@w0tx.org

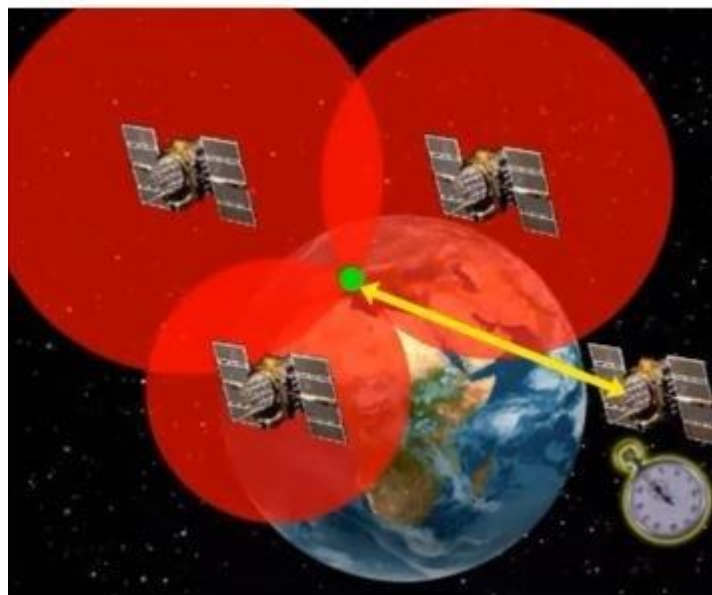
APRIL 20TH VIDEO MEETING ANNOUNCEMENT

BY BILL RINKER, W6OAV

Most of us use “SatNav” which we often take for granted. So, what is “SatNav”? According to the Cambridge Dictionary the definition is “a system of computers and satellites, used in vehicles and other places to tell you where something is, where you are, or how to get to a place”. Plan to attend the April 20th video meeting and learn about how the SatNav system works. John Ackermann, N8UR, will provide a presentation detailing the workings of the SatNav system.

Bio:

John was licensed in 1974 and has operated as WN9OWI, WB9OWI, AG9V and N8UR. He retired in 2017 as a lawyer for a major tech company. He is interested in VHF/UHF contesting, design and building. John bills himself as a “time-nut” fascinated by time, frequencies and test measurements. He is a past president and current board member of TAPR, an international R&D group developing digital radio technology.



WHY ARE WE CALLED HAMS?

PROVIDED BY FRED HART, AA0JK

WRITTEN BY GERRY CRENSHAW, WD4BIS

Copyright 2005 Gerald Crenshaw WD4BIS. All rights are reserved.

Posted with general permission from: gsl.net/wd4bis/newham/nhp9.html

There are several explanations out there for calling us HAMS, but this one I had not seen before. - Fred

(This was previously published in the Amateur Radio Communicator March / April 1994)

Have you ever wondered why we radio amateurs are called "HAMS"? Well, according to the Northern Ohio Radio Society, it goes like this: the word ham was applied in 1908 and was the call letters of one of the first Amateur wireless stations operated by some members of the HARVARD RADIO CLUB. There were Albert S. Hyman, Bob Almy and Peggie Murray. At first, they called their station Hyman-Almy-Murry. Tapping out such a long name in code soon called for a revision and they changed it to HY-AL-MU, using the first two letters of each name.

Early in 1909, some confusion resulted between signals from Amateur wireless HYALMU and a Mexican ship named HYALMO, so they decided to use only the first letter of each name and the call became HAM.

In the early pioneer unregulated days of radio, Amateur operators picked their own frequency and call letters. Then, as now, some Amateurs had better signals than some commercial stations. The resulting interference finally came to the attention of congressional committees in Washington and they gave much time to proposed legislation designed to critically limit Amateur activity.

In 1911, Albert Hyman chose the controversial Wireless Regulation Bill as the topic for his thesis at Harvard. His instructor insisted that a copy be sent to Senator David I. Walsh, a member of one of the committees hearing the bill. The Senator was so impressed, he sent for Hyman to appear before the committee. He was put on the stand and described how the little Amateur station was built. He almost cried when he told the crowded committee room that if the bill went through, they would have to close up the station because they could not afford the license fees and all the other requirements that were set up in the bill.

The debate started and the little station HAM became a symbol of all the little Amateur stations in the country crying out to be saved from menace and greed of the big commercial stations who did not want them around. Finally, the bill got to the floor of Congress and every speaker talked about the poor little station "HAM."

That's how it all started. You will find the whole story in the Congressional Record. Nationwide publicity associated station HAM with Amateurs. From that day to this, and probably to the end of time, in radio, an Amateur is a HAM.



NEW AMATEUR RADIO LICENSE FEE

PROVIDED BY FRED HART, AA0JK

Effective April 19, 2022, a \$35 fee will apply to applications for a new Amateur Radio license, renewal, and vanity call signs. Administrative updates and upgrades will be exempt.

For the full Public Notice, see: [fcc.gov/document/effective-date-wireless-application-fee-rates](https://www.fcc.gov/document/effective-date-wireless-application-fee-rates)

WATCH ANTENNAS AND RADIO WAVES IN ACTION

BY BILL RINKER, W6OAV

Interested in seeing how antennas generate radio waves, how radio waves propagate and what happens when they reflect off a surface? Is so, watch a very nice video produced by the Royal Canadian Air Force. The video can be viewed at [youtube.com/watch?v=-F7KYLO4Bkg](https://www.youtube.com/watch?v=-F7KYLO4Bkg).



WHICH IS BETTER, AN HF VERTICAL OR DIPOLE

BY BILL RINKER, W6OAV

A discussion often heard on our repeaters is “Which is better on HF, a $1/4\lambda$ ground plane, an end fed $1/2\lambda$ vertical or a horizontal $1/2\lambda$ dipole?”

The purpose of this article is to provide information to help a station owner answer the above question based on that operator’s communications objectives and available facilities. The antenna radiation patterns in this article were developed over 4NEC2’s “Real Ground”. The patterns are appropriate for any frequency band for which that antenna is scaled. The symbol (X) in the text below indicates a reference X at the end of this article.

1/4λ HF Ground Plane Antennas

Ground Plane (GP) antennas are very well known, easy to build and perform pretty well. (1). Figures 1A and 1B show the radiation patterns of a ground mounted $1/4\lambda$ GP vertical with four $1/4\lambda$ radials. The blue line in the figures represents the horizontal radiation pattern and the red line represents the vertical

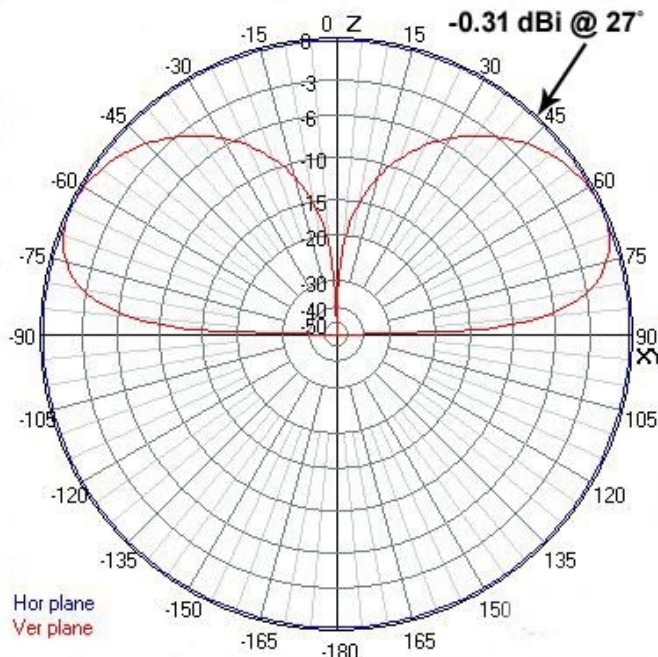


Figure 1A - Patterns of a 1/4λ GP on the ground

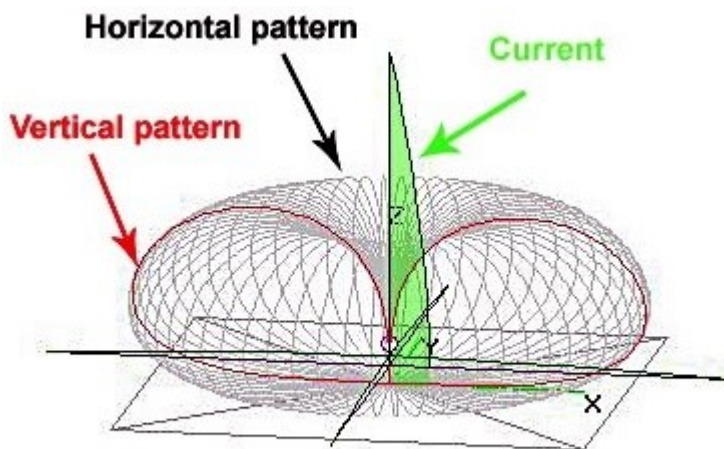


Figure 1B- Patterns of a 1/4λ GP on the ground

radiation pattern. (2) & (3). Note that the radiation patterns for a ground mounted 1/4λ GP are omnidirectional and peak at -0.31 dBi @ 27° above the horizon.

Figures 2A and 2B show what happens to the radiation patterns when that same GP is raised approximately 1/4λ above ground (perhaps on a roof or a pole). Note that the peak gain has increased to 1.50 dBi and has lowered to 16° above the horizon. (4).

In actual practice, an elevated 1/4λ GP will usually radiate a stronger signal to the horizon than a ground mounted 1/4λ GP. The reason is because most of the radiation (indicated by the green RF current line in Figures 1B and 2B) occurs from the bottom 2/3s of the vertical. This means that normally some of the ground mounted GP's radiation will be absorbed by nearby houses, trees, lossy ground, etc. When the antenna is elevated, most of the radiation will pass over these lossy obstacles.

The advantage of a 1/4λ GP is that it is easy to construct and easy to hide when ground mounted. The disad-

vantage of a $1/4\lambda$ GP is that the required radials increases the necessary horizontal space and can be a safety hazard. The ground system needs to be very effective for the GP to perform satisfactorily. Sixteen $1/4\lambda$ radials make for a good ground mounted GP and four $1/4\lambda$ radials make for a good elevated GP. Unfortunately, an elevated GP offers more wind resistance and is more obvious to neighbors.

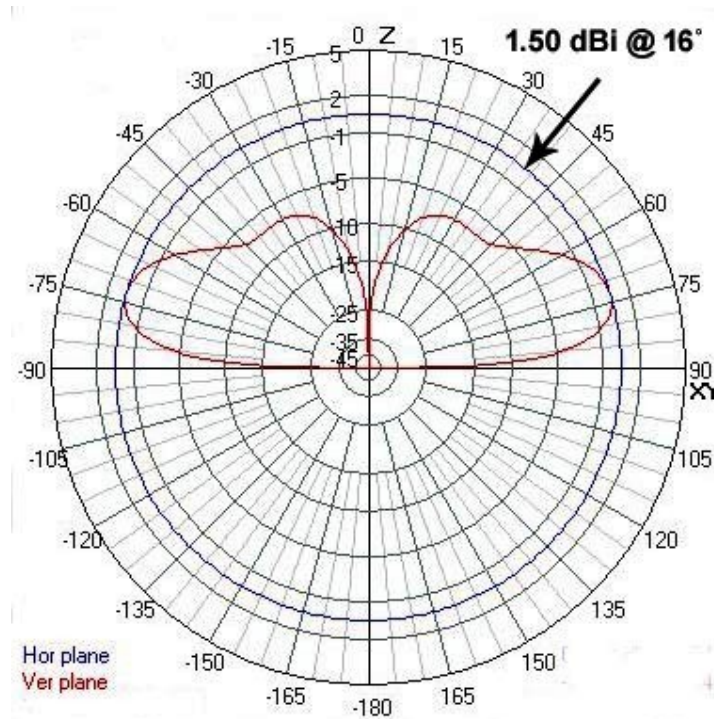


Figure 2A- Patterns of a $1/4\lambda$ GP $1/4\lambda$ above ground

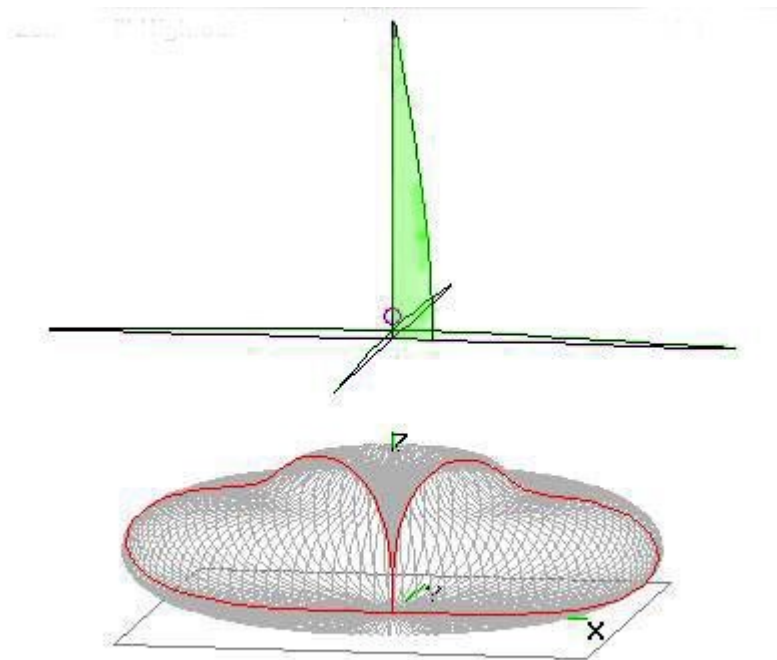


Figure 2B- Patterns of a $1/4\lambda$ GP $1/4\lambda$ above ground

Commercial single band HF verticals are available at:

<https://www.dxengineering.com/search/department/antennas/section/hf-vertical-antennas?SortBy=Default&SortOrder=Ascending&GroupBy=ProductName&N=part-type%3Ahf-vertical-antennas-and-packages>

1/2λ HF Vertical Antennas

Figures 3A and 3B show the radiation patterns of a ground mounted end fed 1/2λ vertical. Note that the peak radiation gain for the vertical is 0.55 dBi @ 18°. These patterns are very close to those of a 1/4λ GP mounted 1/4λ high and much better than those of a ground mounted GP. See Chart 1.

Just as with an elevated 1/4λ GP, the 1/2λ vertical will outperform the ground mounted 1/4λ GP since the maximum current is 1/4λ above ground (Green RF current line in Figures 1B & 3B) thus clearing most surrounding lossy obstacles.

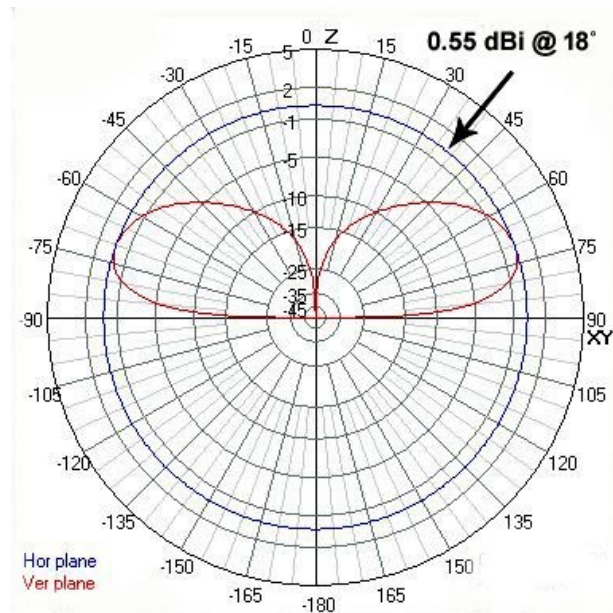


Figure 3A- Patterns of a 1/2λ vertical on the ground

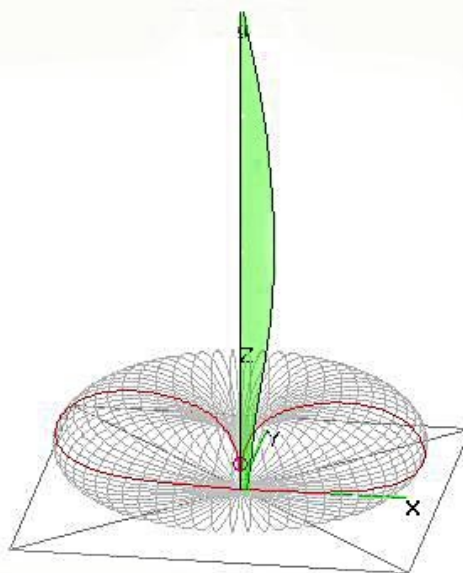


Figure 3B - Patterns of a 1/2λ vertical on the ground

The disadvantage of all vertical antennas is that they are noisier than horizontal antennas. Verticals tend to be more sensitive to vertically-polarized noise generated by machines, lightning, overhead power lines, etc.

Commercial single band end fed 1/2λ HF verticals are available at:

<http://www.parelectronics.com/end-fedz.php>
http://www.earchi.org/92011endfedfiles/Endfed6_40.pdf
<https://mfjenterprises.com/collections/antenna>

Multiband Shortened HF Vertical Antennas

Most hams cannot install 1/2λ tall 40, 60 or 75 meter verticals due to their height. That operator must choose between shortened multiband verticals with or without radials. According to the ARRL verticals without radials will not perform as well as those with radials (<http://www.arrl.org/no-free-lunch>). However, radial-less verticals are a good solution if there is no space for radials. The old adage is true that the bigger the vertical, the coils and the more the radials, the better the performance!!

A good overview of ten of these verticals is available at <https://www.radio4all.org/best-hf-vertical-antenna/>

Commercial multiband verticals are available at:

<http://www.parelectronics.com/end-fedz.php>
http://www.earchi.org/92011endfedfiles/Endfed6_40.pdf
<https://palomar-engineers.com/tech-support/tech-topics/best-hf-end-fed-antenna>

<https://alphaantenna.com/product/hf-antennas/base-hf-antennas/efhw-end-fed-half-wave-6-80-meter-base-portable-endfed-hf-alpha-jpole-jr-antenna/>
<https://www.dxengineering.com/search/department/antennas/section/hf-vertical-antennas?SortBy=Default&SortOrder=Ascending&GroupBy=ProductName&N=part-type%3Ahf-vertical-antennas-and-packages>

Horizontal 1/2λ HF Dipoles

Figures 4A and 4B show the radiation patterns of a horizontal 1/2λ dipole located 1/2λ above the ground. A horizontal dipole needs to be at least a 1/2λ above ground to have a fairly low-angle of radiation. As a horizontal dipole is lowered below 1/2λ, the angle of radiation rapidly approaches 90° straight up! Raising a dipole will lower the main radiation lobe a bit but will also rapidly direct radiation straight up and create a null around 45°. Figure 5 shows the patterns for heights of 0.5λ, 0.6λ and 0.8λ. Many folks say that a dipole at 0.6λ high is best for both near and far distance propagation.

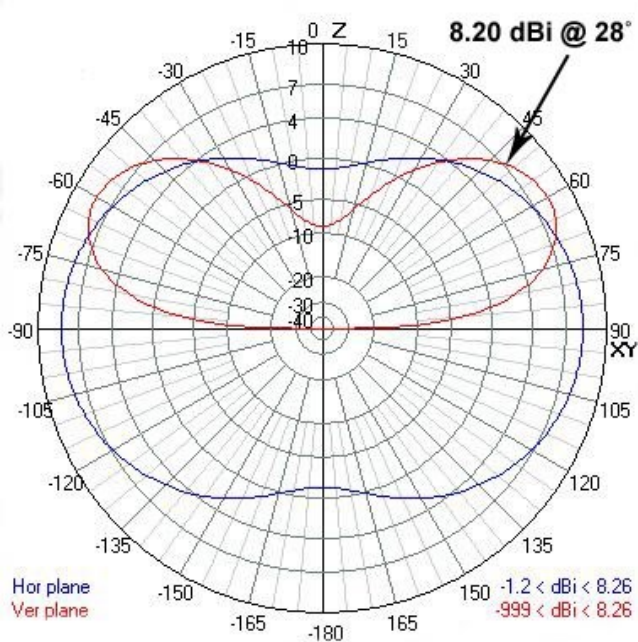


Figure 4A - Patterns of a horizontal dipole up 1/2λ

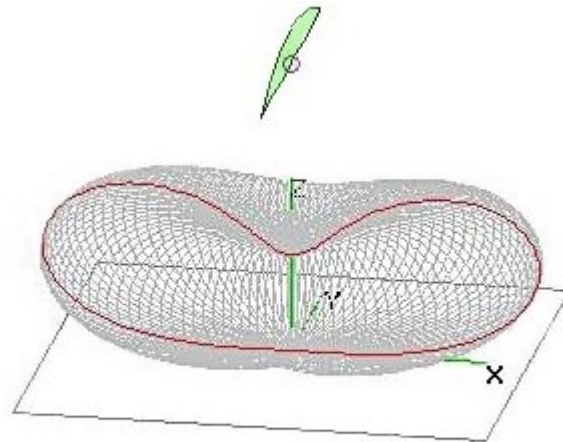


Figure 4B - Patterns of a horizontal dipole up 1/2λ

Horizontal dipoles have several configuration advantages. One is that they do not have to be straight. They can be bent, sloped; etc. (5). They can also be formed into a Vee. (6). Secondly, horizontal dipoles are easier and cheaper to build and erect. Also, they tend not respond to vertically polarized noise.

Horizontal dipoles do have several disadvantages. One is they are not omni directional as are verticals. This could be an issue if one desired to work certain directions. Secondly, the lower the design frequency, the more the horizontal space is required. Also, they are harder to hide due to the requirement for two or three supports.

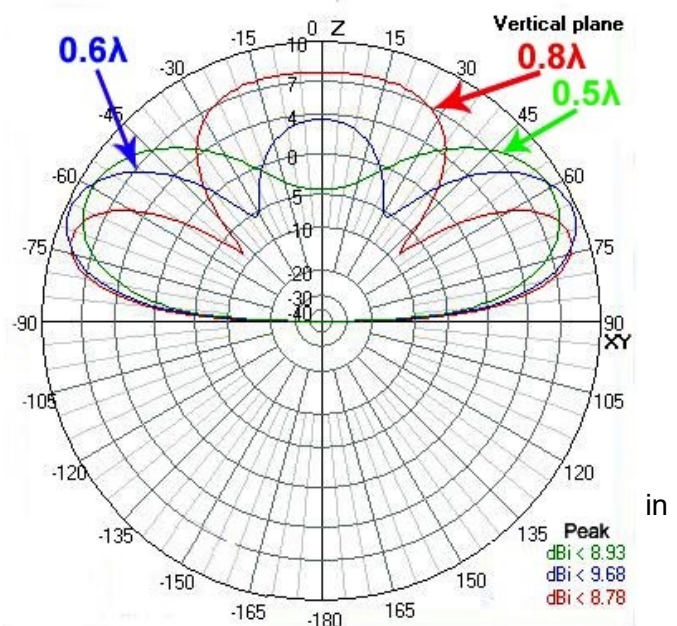


Figure 5 - Dipole patterns at 0.5λ , 0.6λ & 0.8λ high

A good dipole radiation pattern reference is available at: <https://ventenna.com/files/Rad-Pattern.pdf>.

Single band and multiband dipoles are available at:
<https://www.dxengineering.com/search/part-type/wire-antennas>
<https://mfjenterprises.com/collections/antenna>

Summary

As a generality, dipoles for 20 meters and above are easier to install at the proper heights ($1/2\lambda$ and above) for good DX coverage. However, for bands below 20 meters shortened multiband verticals are normally easier to install for good DX operation.

Since I don't have facilities for a beam, my preferred HF antenna configuration consists of two different antennas. The first antenna is an as large as possible non resonant multiband dipole fed with ladder line. (7). The dipole is at 0.6λ elevation for 20 meters. The second antenna is an as tall as possible end fed multiband ground mounted vertical on a tilt over base with 2 radials per band. (More radials would be better but space is an issue). I prefer to have both antennas for three reasons. The first reason is that I can switch to the antenna that has the best radiation pattern for a particular contact's direction. The second reason is to combat polarization fading. Often, when an incoming signal begins to fade out on one antenna, it is due to incoming signal polarization shift. Switching to the other antenna with the opposite polarization characteristics causes the signal to become stronger. The third reason is that sometimes the vertical puts a stronger signal into a contact's location. However, the vertical's receive signal to noise ratio makes copying the incoming signal tough. The contact's signal may be weaker on the dipole but the signal to noise ratio is better making copying easier. So, in that case, I transmit on the vertical and receive on the dipole.

I use the dipole most times on 20 meters and above. However, I have used the dipole on 40, 60 and 75 meters for NVIS communications where most of the radiation goes straight up. (8). The horizontal dipole fed with ladder line and a good tuner loads up and radiates very nicely on all bands from 75 meters to 10 meters.

Chart 1 summarizes the characteristics of the four antennas discussed above.

Chart 1 – Comparison of Antennas			
Antenna	Height	dBi @ Degrees	Pattern
$1/4\lambda$ GP e/w 4 radials	Ground Mounted	-0.31 @ 27°	Omni
$1/4\lambda$ GP e/w 4 radials	$1/4\lambda$	1.50 @ 16°	Omni
$1/2\lambda$ Vertical	Ground Mounted	0.55 @ 18°	Omni
$1/2\lambda$ Horizontal Dipole	$1/2\lambda$	8.20 @ 28°	Figure 8

Notes:

- (1). Building an HF Vertical $1/4\lambda$ Monopole [youtube.com/watch?v=VjI9G0WjiFo](https://www.youtube.com/watch?v=VjI9G0WjiFo)
- (2). "What is an Antenna Radiation Pattern?", Part 1, *Roundtable*, Oct 2010, Page 3 [w0tx.org/RoundtableArchive/2010-RoundTables/RT201010\(OCT\).pdf](http://w0tx.org/RoundtableArchive/2010-RoundTables/RT201010(OCT).pdf)
- (3). "What is an Antenna Radiation Pattern?", Part 2, *Roundtable*, Nov 2010, Page 3 [w0tx.org/RoundtableArchive/2010-RoundTables/RT201011\(NOV\).pdf](http://w0tx.org/RoundtableArchive/2010-RoundTables/RT201011(NOV).pdf)
- (4). "An Experimental Look at Ground Planes" nonstopsystems.com/radio/pdf-ant/article-antenna-elevated-radials.pdf
- (5). "Don't Load it, Bend it", *Roundtable*, Oct 2017, Page 17 [w0tx.org/RoundtableArchive/2017-RoundTables/RT201710\(OCT\).pdf](http://w0tx.org/RoundtableArchive/2017-RoundTables/RT201710(OCT).pdf)
- (6). "Vee vs Dipole", *Roundtable*, Dec 2010, Page 3 [w0tx.org/RoundtableArchive/2010-RoundTables/RT201012\(DEC\).pdf](http://w0tx.org/RoundtableArchive/2010-RoundTables/RT201012(DEC).pdf)

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- (7). "An HF Antenna for Small Yards", *Roundtable*, Aug 2021, Page 8
[w0tx.org/RoundtableArchive/2021-RoundTables/RT202108\(AUG\).pdf](http://w0tx.org/RoundtableArchive/2021-RoundTables/RT202108(AUG).pdf)
- (8). "Near Vertical Incidence Skywave (NVIS)" hamradioschool.com/nvis
- (9). "Which is Better: Vertical or Dipole?", David Casier, KE0OG youtube.com/watch?v=pRTTo01Qttbc
- (10). Vertical vs Horizontal – HF Monopole vs Dipole m0spn.co.uk/2020/09/24/vertical-vs-horizontal-hf-monopole-vs-dipole
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STATIC BLEEDER FOR YOUR ANTENNA

PROVIDED BY FRED HART, AA0JK - ELMER@W0TX.ORG

Here in Colorado with our dry climate, we notice problems with static electricity. Whether its a zap from shuffling ones feet on the living room carpet, to pesky feed-line issues in the shack.



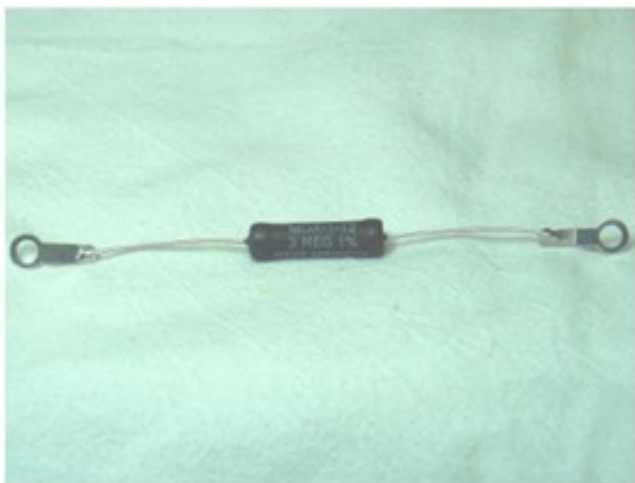
During our weekly Learning Net, the subject came up, and not feeling that the subject was adequately addressed, being the clubs designated Elmer, further re-search was due.

Many antennas don't have a means of bleeding off static build-up. This includes your popular verticals, dipoles and antennas without transformer-type bal-uns.

This can also be a concern with other antenna accessories such as your impedance matching tuner, and antenna analyzer. These can also be damaged when the arc jumps the gap.

So what can we do to solve this problem? On further inquiry, the solution suggested by hams, is to permanently connect a high voltage, high value resistor across the feed-point of all your antennas.

For the resistor, you can use the Ohmite Maxi-Mox™ MOX-1-123004F thick-film resistor which is perfect for this application. This resistor is rated at 10KV and 3-megohms, and available from mouser.com, Mouser part number 588- MOX-1-123004F. Normally you'll just need a single resistor, but if you run high power to a highly reactive antenna (like a 43-foot vertical on 160 meters), you might want to put 2-3 of these resistors in series. Photos show a single resistor ready for installation on a 20/15/10 meter dipole. Three resistors in series, covered with liquid electrical tape, mounted at the base of a 43-foot vertical should help alleviate your static problems. Spend a few dollars and stop worrying about damage to your ham gear.

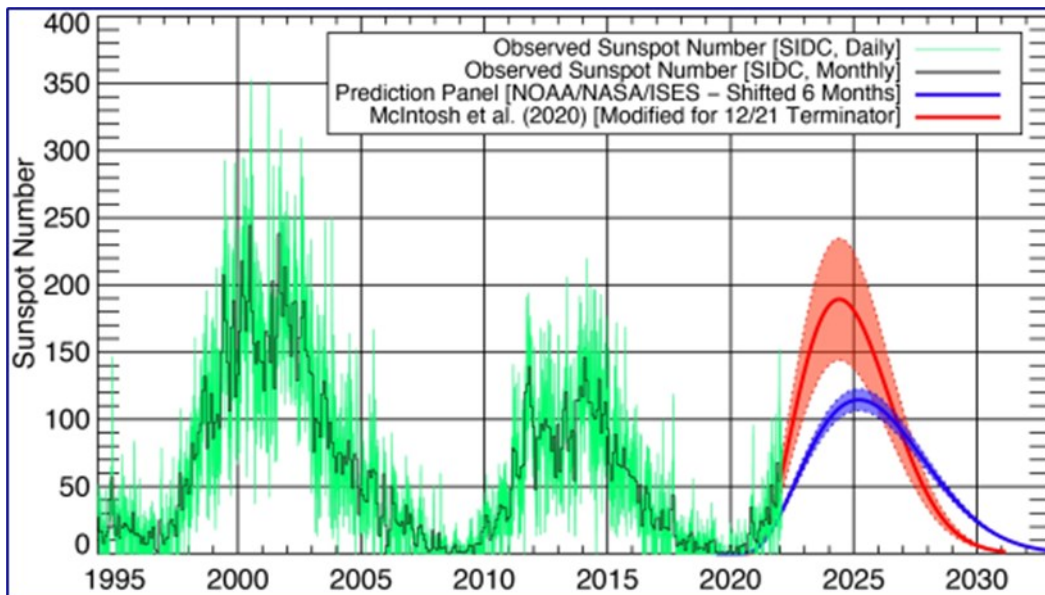
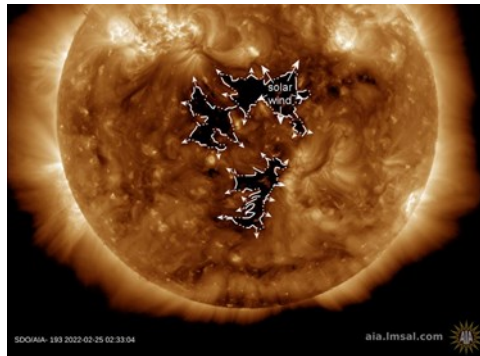


SOLAR GEOPHYSICAL ACTIVITY REPORT

PROVIDED BY FRED HART, AA0JK



March 1st - Earth was inside a stream of solar wind flowing from a loosely organized cluster of holes in the sun's atmosphere. Geomagnetic storms were not expected at the time. However, lesser geomagnetic unrest was possible.

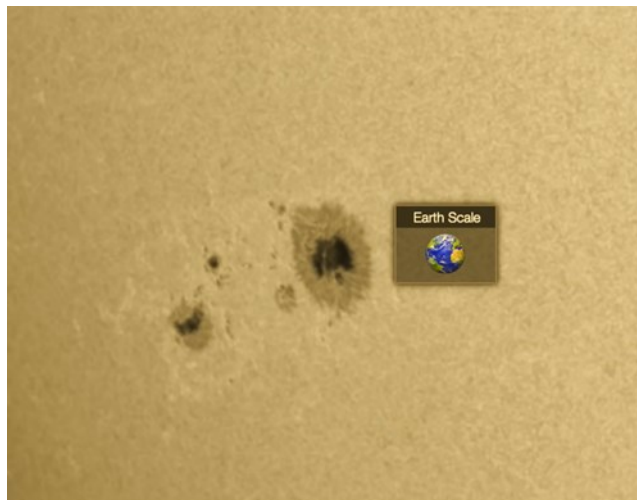


Above: Predictions for Solar Cycle 25. Blue is the official prediction of a weak cycle. Red is a new prediction based on the Termination Event.

March 5th - A plasma vortex on the sun, hot plasma wide enough to swallow Earth, swirling faster than 50,000 mph.



It gets its structure from curling magnetic fields, which confine the plasma into a loop. At this very moment the loop was winding tighter and tighter, a buildup of tension that could tear the vortex apart.



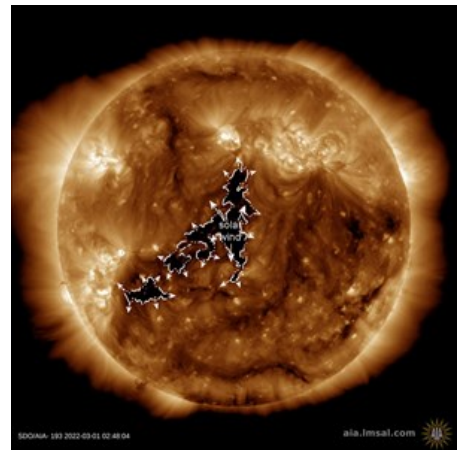
A series of minor G1-class geomagnetic storms erupted on March 5-6 as a stream of high-speed solar wind buffeted our planet's magnetic field. Now, Earth was exiting the stream and the storms were subsiding.

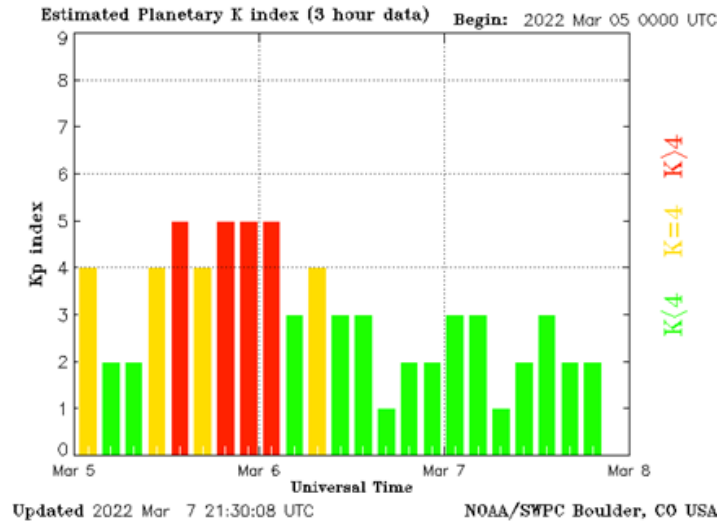
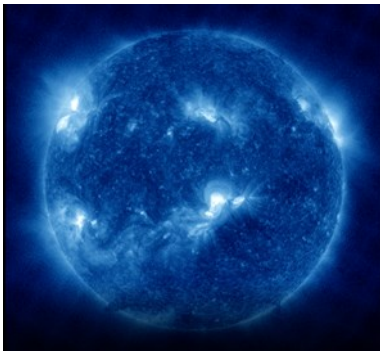
The Radio Sun: 10.7 cm flux: 120 sfu

High-speed stream of solar wind was flowing from this equatorial group as it passed central longitude.

March 7th - A quiet sun. The sun had not produced a significant solar flare for nearly a week.

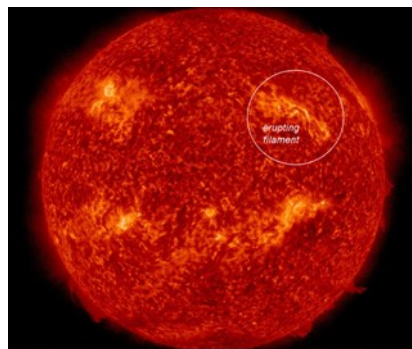
Focusing back on the sun spots. No notable activity or morphing in the active regions. There was the magnetism, and a number of spots, but not the complexity, size, or active dynamics needed for bigger flare activity.



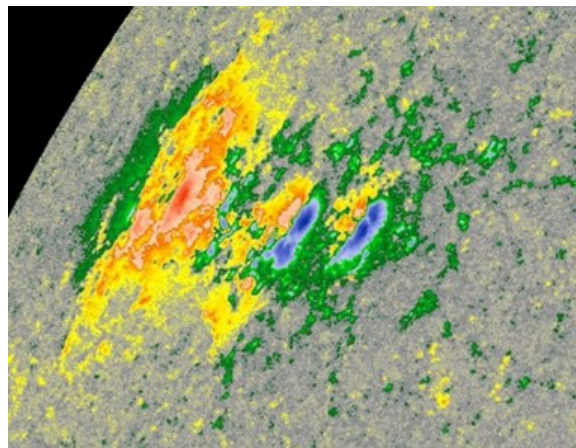


Upper Left Image Credit: SDO/AIA 335 A. Solar wind telemetry was dropping in speed and density allowing a recovery of earth's magnetic field back out of storm conditions.

March 8th - Erupting filament. Image Credit: SDO/AIA 304.

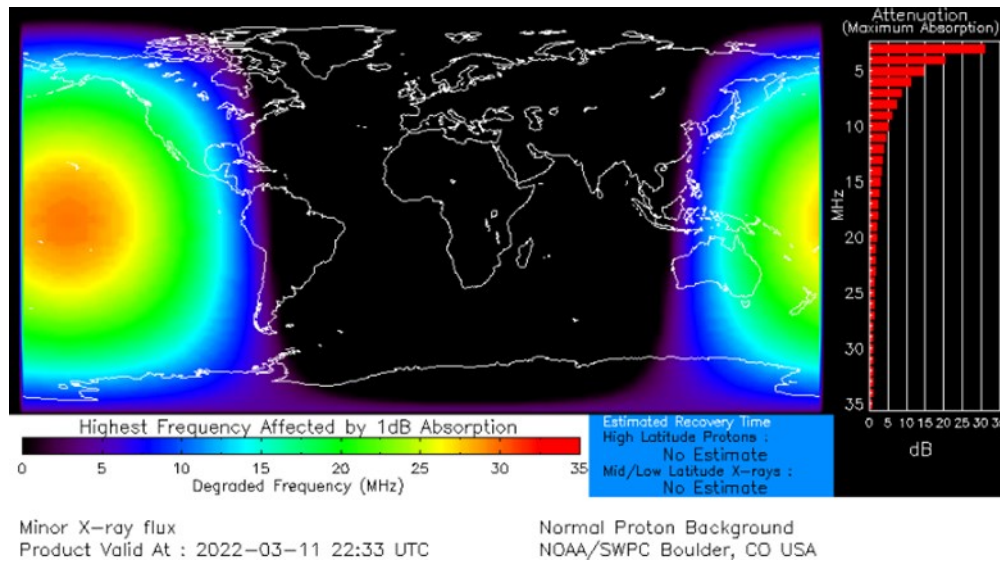


March 10th - Solar activities had been mostly quiet. This would soon change.



Incoming on the east limb, an active region was developing into a potential flare generator as magnetic regions formed and moved into an earth facing longitude strike zone.

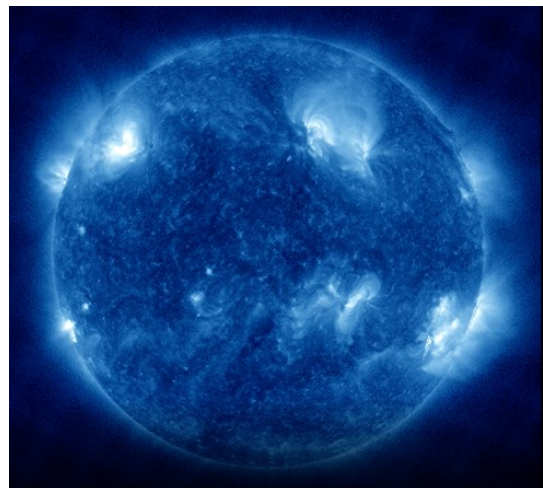
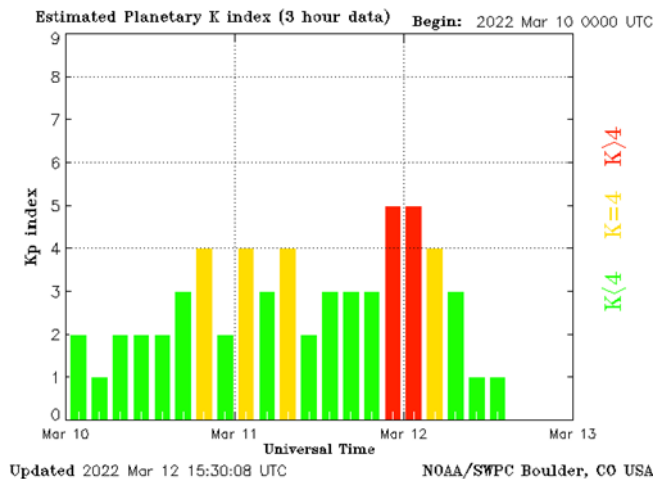
March 12th - Radio Blackout



Departing sunspot AR2964 produced a M2-class solar flare. The explosion on March 11th at 2232 UT caused a brief shortwave radio blackout over the Pacific Ocean. Mariners and ham radio operators may have noticed unusual propagation effects at frequencies below ~20 MHz.

Last 24 hours were pretty active with several sunspot groups, with several filaments. There was no shortage of motion or crackling. Flares with long duration, beat impulsive flares of bigger magnitude continually. CME's were not even in the same league. A long duration flare CME was on its way, and expected to impact earth.

The solar wind showed we had been in unsettled geomagnetic conditions for over a day. Over night the phi angle flipped as a solar winds magnetic reversal finally dropped earth's field into storm conditions. This was expected to bring us back to normal by the time that the next CME was expected to arrive.

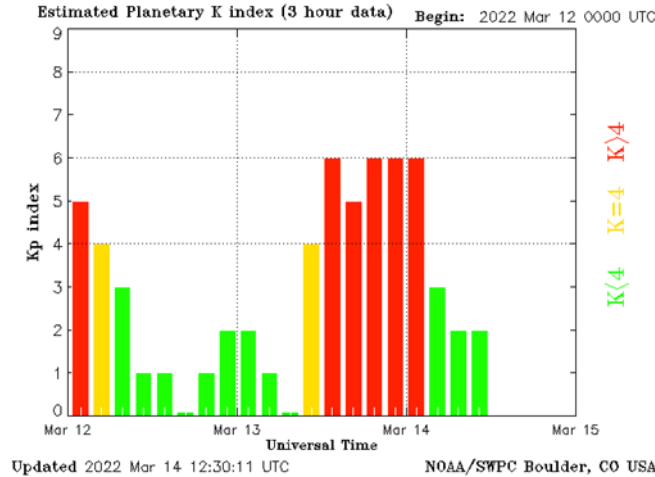


Upper Right Image Credit: SDO/AIA 335 A

A northern incoming active region was a monster in size but no sign of change as its leading umbra was maintaining its magnetic separation. The field setup was simple and stable. It only had minor filaments in its complex to disrupt and eject any flaring as eyes were on its morphology.

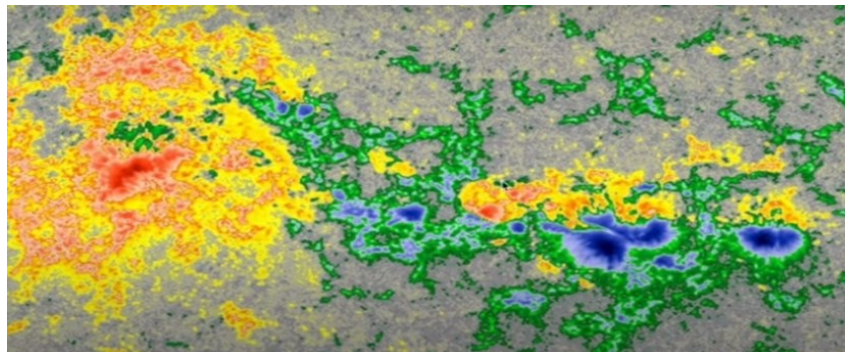
Normally, C-class flares are not considered to be strong. However, this one lasted nearly 12 hours, allowing it to pump plenty of energy into the CME.

March 14th - CME Impact

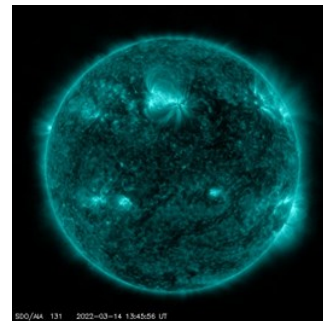
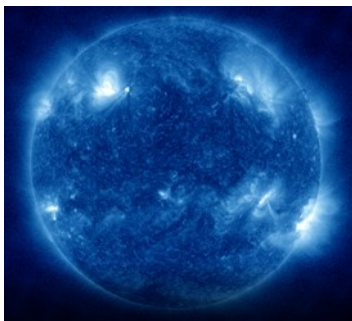


Geomagnetic storm. - Another solar flare.

Solar wind showed a simultaneous jolt in all the telemetry markers with moderate speed and a nice bit of density enhancement. The geomagnetic effects began almost right away. We ended up spending the majority of the day in level one or two geographic storms kp5 and kp6. There was a solid coupling to the event, and it was taking its time making its way from the magnetosphere, downward, to the ionospheric storm corrections. This showed the descent of the perturbation didn't really begin until later in the morning. Attention was on electrical issues, in terms of electrical fires and transformer fault trips. There had been an increased number of these already reported.



The sun was now crackling, but not much happening in the earth-facing heliographic longitudes. The very end of the sequence, a little flash from the central northern grouping, and impulsive m-class solar flare, did not produce a CME. This line of sunspots was developing magnetic complexity that would be needed for bigger flares. Everywhere blue and red were trying to tango and become a potential flare maker.



Left Image: SDO/AIA 335 A. Right Image: SDO/AIA 131 A

The Radio Sun: 10.7 cm flux: 123 sfu

March 15th - Multiple geographic storms heading towards earth.

AR2965 had an unstable 'beta-gamma' magnetic field. Between the sunspot's, many dark core patches of north and south magnetic polarity, were pressed together, creating conditions ripe for explosive magnetic re-connection. As a result, we saw M-class solar flares three out of the past five days.

The explosions did not hurl any significant CMEs toward Earth. Their primary effect was to cause a series of minor shortwave radio blackouts. Mariners, aviators, and ham radio operators may have noticed unusual propagation at frequencies below 20 MHz.

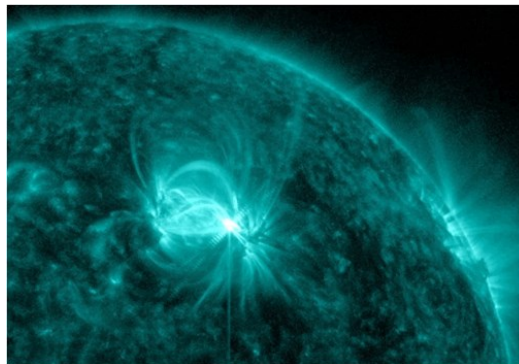
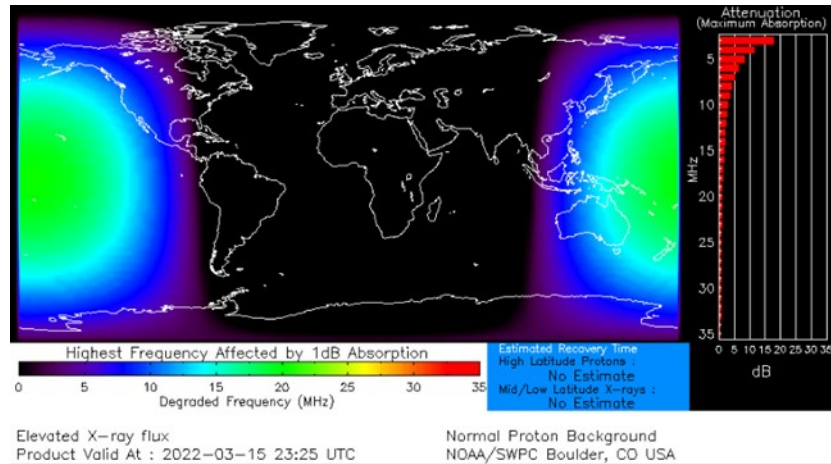


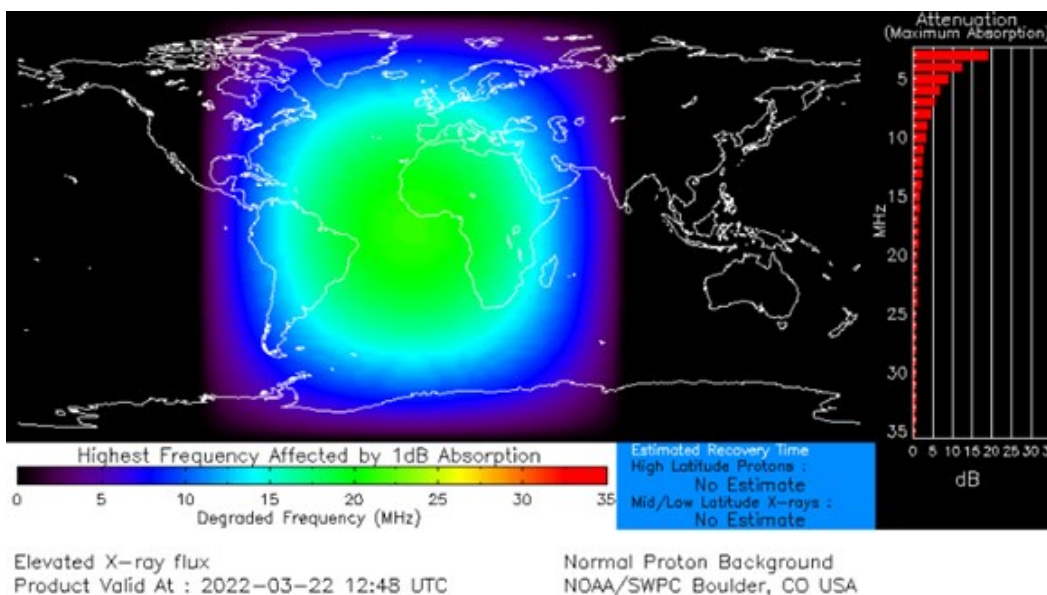
Image Credit: SDO/AIA 131 A

The pulse of ultraviolet radiation, shown above, ionized the top of Earth's atmosphere. This, in turn, caused a minor shortwave radio blackout over the Pacific Ocean. Mariners, aviators, and ham radio operators may have noticed unusual propagation effects at frequencies below 20 MHz for ~30 minutes around 23:30 UTC.

Facing Earth, the sunspot had been producing such a flare about once a day for the past week. Each explosion briefly disrupted shortwave radio communications on the day-side of our planet. Remarkably, none of the flares hurled a CME into space. This series of radio blackouts shows that the sun can affect Earth even without a CME.

March 22nd - A new sunspot emerging over the sun's northeastern limb exploding on March 22nd @ 1242 UTC, producing a C7-class solar flare.

X-rays ionized the top of Earth's atmosphere which, in turn, caused a brief shortwave radio blackout over the Atlantic Ocean. Frequencies affected were mostly below 15 MHz.



PLANNED - SYSTEM TESTING AND MAINTENANCE 24 MARCH 2022. Published: Wednesday, March 23, 2022 15:27 UTC. - You may have noticed disruptions in products and services during SWPC's planned system testing and maintenance. This activity was scheduled for 24 March, from 1500 UTC (1100 ET) - 2200 UTC (1800 ET). Additional testing was planned for 29 March, and 4 & 12 April, 2022.

Forecast: Issued: 2022 March 23 1230 UTC. Prepared by the U.S. Department of Commerce, NOAA, Space Weather Prediction Center.

NOAA Geomagnetic Activity Observation and Forecast: The greatest expected 3 hr Kp for Mar 23-March 25 2022 was 4. No G1 (Minor) or greater geomagnetic storms were expected. No significant transient or recurrent solar wind features were forecast.

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

73,

Fred
 AA0JK

DRC's Trading Post
 Don't forget you can find **locally-sourced, ham-grown** merchandise at:
<https://www.w0tx.org/trade.htm>

PAST ROUND TABLE PAGES

PROVIDED BY WOODY LINWOOD, W0UI

A page from the a 1960s edition.

The Roundtable again changed its appearance in '63, from a mimeograph to printed production featuring the Denver skyline on a multi-colored cover. The first class mail rate was only a 4¢ stamp. "Hats Off to a Ham" featured a thumb-nail sketch of a club member each month.

The Feb. issue carried a warning (which needs repeating) - "There is no excuse whatsoever for not replying to any FCC notice. It is for your benefit and for amateur radio to reply ^{at} ~~to~~ once to such notice. Should you receive a notice for any infraction of any rules, reply at once, in writing."

1963 was the year the FCC was considering restricted voice bands - later identified as Docket 15928, but generally known as "incentive licensing". It was also the year the commission ordered fees for handling license applications (to be effective 1/1/64).

WØWYX reported on his 4 circulator element quad antenna for 2 meters featuring a "marvelous front-to-back ratio, no side lobes, and low noise pick-up."

Bill Walker, WØOWP, was elected club president for '63-'64 and the first tower case of the area was filed ~~aga~~ against WØJRQ in Lakewood.

News of 1964 included KØATZ as editor of the Roundtable followed by WAØGFI with KØFXE in charge of advertising and production. Eight nets were listed for Denver and Colo. coverage of traffic, RACES, weather, AREC and code practice. Regular contributors of news, technical topics, and some appropriately critical humor were Val, KØZSQ, Kayla, WØHJL, and Elise, YF of KØCNV. WØCXW was elected club pres. and WØBJW re-elected ARRL Director for a second term.

PAST ROUND TABLE PAGES, CONTINUED

PROVIDED BY WOODY LINWOOD, W0UI

The next two years ('65 & 66) were relatively smooth with the usual problems of increasing membership and keeping abreast of financial solvency.

KØATZΞ was elected president in Sept. '65 followed by Warren Torrington, WØDZN in '66 (the first of his two terms). WØHJL became the editor and for two years made every effort to spark more activity in the club.

Code practice was conducted by Glen, WØFA, and WØIJU and later WØISL conducted theory classes for prospective amateurs. KØEZH wrote a regular DX column and Elise White began her long series of "SWOOP".

(Suffering Wives Of Operators) B-A was the largest supporting advertiser and a new store, CW Electronics made its first appearance.

DRC's EMERGENCY RESPONSES

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

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

[W0TX Repeater Directory](#)



Note to DRC Members:

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

RANDOM SITE OF THE MONTH
[OptOut](#)

THE ROUND TABLE ARCHIVE

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

THE ROUND TABLE ARTICLE INDEX

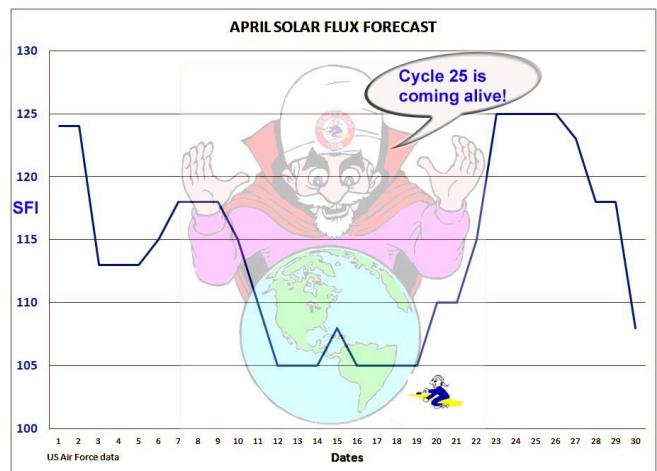
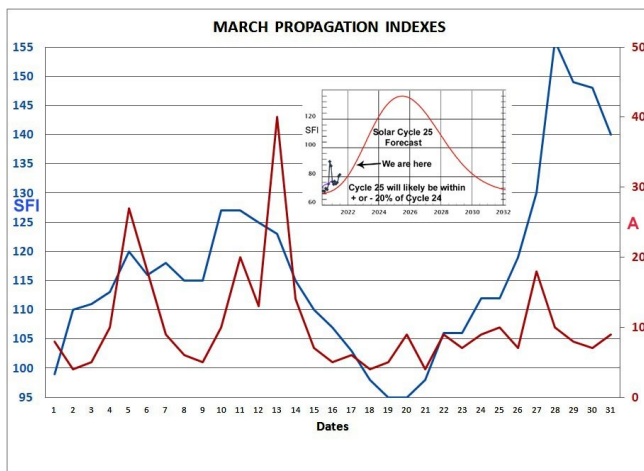
Go to: <http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf>

PAST & FUTURE PROPAGATION CONDITIONS

By Bill Rinker, W6OAV

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

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



UPCOMING EVENTS
HAMFESTS & CONVENTIONS

Event	Date	Location	Sponsor Website
LARCFest 2022	04/02/22	Boulder County Fairgrounds	w0eno.org

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
Louisiana	04/02/2022	04/03/2022	Louisiana Contest Club	
Mississippi	04/02/2022	04/03/2022	ARRL Mississippi Section	
Missouri	04/02/2022	04/03/2022	Boeing Employees' Amateur Radio Society – St. Louis	
Georgia	04/09/2022	04/10/2022	Georgia QSO Party	
Nebraska	04/09/2022	04/10/2022	Nebraska QSO Party	
New Mexico	04/09/2022	04/10/2022	New Mexico QSO Party	
North Dakota	04/09/2022	04/10/2022	ARRL ND Section Manager	
Michigan	04/16/2022	04/17/2022	Michigan QSO Party	
Ontario	04/16/2022	04/17/2022	Contest Club Ontario	
Quebec	04/17/2022	04/17/2022	Club Radio Amateur de l'Outaouais	
Florida	04/30/2022	05/01/2022	Florida QSO Party	



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<http://www.arrl.org/>



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 smile.amazon.com. Select Denver Radio Club, Inc. as the organization you want to support and proceed with your order as usual. Amazon Smile will credit the DRC automatically. Thank you for your support.

DRC REPEATERS

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






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APRIL 2022							<i>DRC Net Sundays at 8:30 p.m. on 145.490 / 448.625 (no PL)</i>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
					1  New Moon	2	
3	4	5	6 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	7	8	9  First Quarter	
10 Rookie Roundup SSB - 1800 - 2359 UTC	11	12	13 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	14	15	16  Full Moon	
17	18	19	20 DRC Online Meeting Elmer 6 p.m. Meeting 7 p.m.	21	22	23  Last Quarter	
24	25	26	27 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	28	29	30  New Moon	

See arrl.org/contest-calendar for additional details about contests.

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Website & YouTube	N0LAJ	Bill Hester	Check Roster	w0tx@w0tx.org

Please Let Us Know

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

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

To respond to this request send your information to drc.editor@gmail.com.

Subject: I'm located in...

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