



THE ROUND TABLE

Monthly Newsletter Of The Denver Radio Club

Since 1917

December 2022

PRESIDENT'S MESSAGE

BY GERRY VILLHAUER, W0GV

I hope all of you had a wonderful Thanksgiving Holiday! Cathy and I enjoyed a great dinner with family and friends. Next up is Christmas. Speaking of Christmas, did you make your reservations for our DRC Holiday Dinner Party? Time is getting closer and we MUST have your reservation by December 12, 2022. Please go to our website, w0tx.org and select the EVENTS tab at the top and then [December Holiday Dinner Meeting](#). From there you can make your reservation, meal selection and pay by PayPal, credit card or print the form and mail with your check. We have not had this event since 2019 and we are hoping for a big turnout this year. **Remember, December 12, 2022 is the absolute deadline and there are NO dinner sales at the door.** We will have great fellowship, prizes and a very interesting program. Don't miss this enjoyable annual event!

Thanks to Jason Oleham, KM4ACK, for a very interesting presentation on the Raspberry Pi computer and the many programs he has developed using Bash at our November meeting. Great Program Jason, we hope to have you back again.

Our presentation at our December Holiday Dinner Meeting will be quite informative and interesting. Dr. Ebru Bozdog, is an Associate Professor at Colorado School of Mines. Her PhD is in Seismology. She uses 3D numerical wave simulations to explore and model Earth's and planetary interiors from the crust to the core. We will learn a lot about what goes on deep in our earth's core. Make those reservations now!

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?

FROM CATHY VILLHAUER, N0CRZ, DRC MEMBERSHIP

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:

Roy Ogborn - KI0ER
Dan Walls - NA5DW

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.

November topics we discussed:

- "Understanding Propagation Numbers" is a key to discover and predict band conditions
 - ARRL Amateur radio operators are being asked to monitor the times of the transmissions and signal quality. Reports can be filed electronically, and a special QSL card will be sent for participation.
 - Electric Vehicles and your HF Gear
 - EVERY Ham Shack needs THIS - ARRL Handbook: [youtube.com/watch?v=TWG4zIYiH4](https://www.youtube.com/watch?v=TWG4zIYiH4)
 - ARRL New Handbook - 100th edition
 - Digital Repeater DRC
 - Yaesu FT-710 AESS HF/50 MHz SDR Transceiver: [youtube.com/watch?v=4zhSieT_CGQ](https://www.youtube.com/watch?v=4zhSieT_CGQ)
-

- POTA Parks On The Air
- ZS6BKW HF multiband ham radio antenna build: youtu.be/YIEN4U8zlpw
- Fox Hunting
- SkyWarn Weather: weather.gov/contact
- NWS Denver/Boulder, CO:
 - Website: weather.gov/bou
 - E-mail: nws.boulder@noaa.gov
 - Phone: 303-494-3210. For a recording call: 303-494-4221
 - BOU Denver/ Boulder, CO Jim Kalina 303-494-3210, BOU Cesar Ochoa
- The 2023 spotter training sessions, which begin in early February 2023
 - Storm Spotter Training: youtube.com/playlist?list=PLhzMljoK81fGyAj0gvvZYRjVHEJ9JNjNe
- NWS Boulder/Denver SKYWARN: weather.gov/bou/skywarn
- Emergency communications: CQ magazine – October 2022
- Getting that first HF radio. 10 Best HF Radios Reviewed and Rated in 2022 - Hamtronics
- Ham Radio Made Simple: Ultimate Beginner Reference Guide (geekprepper.com)
- Building a New Ham Radio Station for Beginners. Ham Shack Building 101
- BaoFeng fox/rat tail antenna counterpoise
- The Prepper Radio Shack: youtu.be/PdeYcVxoskk
- Diamond (Original) RH77CA 144/440 MHz. Dual-Band High Gain Handheld Antenna
- End-Fed Antennas
- Chameleon Antennas - Ham Radio, Loop Antenna, Portable Antenna - chameleonantenna.com
- Homebrew antennas

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](https://w0tx.org), 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

DECEMBER MEETING PRESENTATION: JOURNEY TO THE CENTER OF THE EARTH & MARS

PROVIDED BY LARY IRONS, K0LAI

Dr. Bozdag is an Associate Professor at Colorado School of Mines. She obtained her PhD in seismology from Utrecht University, and MSc/BSc degrees in geophysics from Istanbul Technical University. She moved to Colorado in 2017 as an Assistant Professor from Nice, France, where she was a tenured Assistant/Associate Professor and held a Chaire d'Excellence position at Université Côte d'Azur CNRS-Géoazur. Before moving to Nice for a faculty position, she was an Associate Research Scholar at Princeton University where she also did her postdoctoral studies.

Dr. Bozdag is a global and computational seismologist. She uses 3D numerical wave simulations to explore and model the Earth's and other planetary interiors from the crust to the core. Using quakes as a passive source, the travel times and paths are analyzed numerically to build planetary models of the core and subsurface.

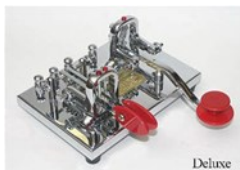
She was a recipient of the NSF CAREER award in 2020, has been a Co-Investigator of the Mars In-Sight mission since 2018, and has served on the editorial board of Geophysical Journal International since 2020.

OUR HF BANDS & WHAT CAN WE EXPECT?

BY FRED HART, AA0JK

Our HF bands and what can we expect to find, for the best use of our allotted spectrum.





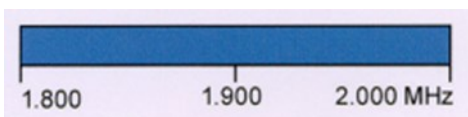
The HF bands are by far the most popular bands in the amateur radio service. Local contacts and world-wide propagation are all possible at almost anytime with careful selection of the right frequency for the time of day, time of year, and current state of the solar sunspot cycle.

How does one strive to bring out the excitement, the expectations we seek, in the amateur radio bands?

First, knowing how these areas of spectrum that we are allotted, behave within the earth's atmosphere.

Lets start with our lowest band and work our way up:

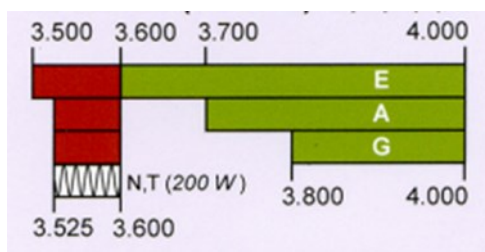
160 Meters



1.8-2.0 MHz: A neighbor to the AM Broadcast band, just slightly higher in frequency, 160 has very similar conditions to what you hear on AM Broadcast, quite localized during the day, with long distance capability at night. During the summer months the long distances at night can be several hundreds of miles and during the winter it can be several thousand miles.

Lots of noise created by static crashes hinder communications in the summer months, but much quieter in the winter! When there is no static, it seems like you can hear forevermore!

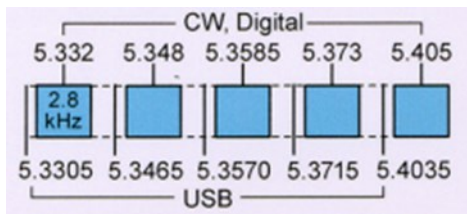
80 Meters



3.5-4.0 MHz.: 80 Meters is very similar to 160 meters, but with greater distances, especially at night. 80 tends to be a very reliable band, less subject to variations of the sunspot cycle. It is used a lot for regular net operations, message handling, and "local rag chewing".

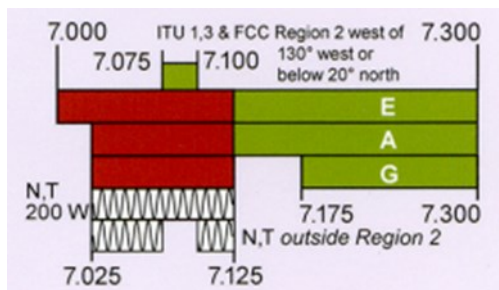
Again, 80 meters can be very noise prone in the summer static. You will meet lots of "local Ham's", and make some very good friends with the "local gang" that hang out here. Various states and groups like to frequent a particular frequency so tune around.

60 Meters



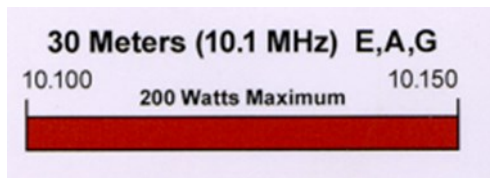
5.332 - 5.405: This is not actually a "Ham Band", but a cluster of 5 frequencies or channels shared with Government users. Many restrictions apply to technical requirements of ham transmitters and antennas. Hams are secondary user of this band, not primary, so, we must yield, to interference problems with Government stations. 60 meter characteristics are much like 80 and 40 meters.

40 Meters



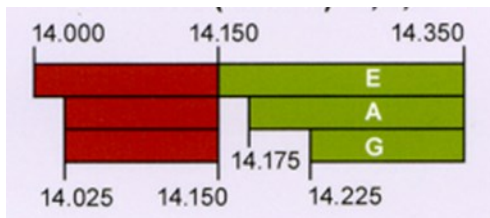
7.0-7.3 MHz: This is many ham's favorite band. It is always open somewhere. During the summer, day-time distances of 300-400 miles, and night time distances of 1000 miles, are very common. Winter days with 500 miles or more are usual, and night time conditions bring DX intercontinental communications. This band is shared with short-wave broadcast from countries outside of North America. Between these interfering signals a ham with a reasonable station can work stations worldwide, if you can find a clear spot!. Not as affected by the sunspot cycle as 20-10 meters. Many nets frequent 40 meters both day and night.

30 Meters



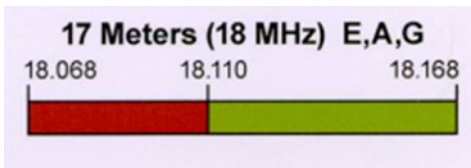
10.100-10.150 MHz.: A lot like 40 meters, but can only be used on CW and RTTY. No broadcast interference, and 30 meters has slightly longer range than 40 meters. Daytime ranges of 1000 miles are quite common.

20 Meters



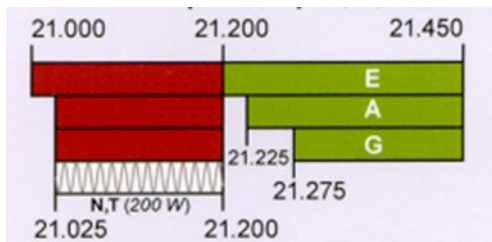
14.000-14.350 MHz.: Just about all of the serious DXers hang out on 20 meters! This can be a VERY exciting band with some of the best DX found on any band. Around the world daytime, communications are generally possible, and when the sunspot cycle is peaking, 20 can be used around the clock! It's not likely to be used for short-range communications. The only way to work someone a few hundred miles away would be scatter or possibly "long path". Ground wave signals of about 50-75 miles might be all you would expect. At the bottom of the sunspot cycle, openings to other continents are short, rare, and far and few between!

17 Meters



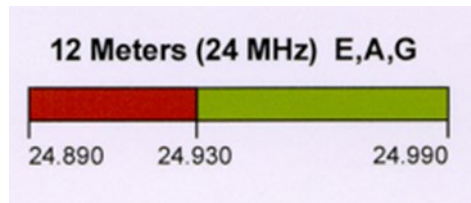
18.068-18.168 MHz.: Band conditions are very similar to 20 meters. This seems to be a very popular band when hams go mobile, and lots of fun can be expected. You will meet some of the finest Hams in the world on 17 meters. A very cordial band!

15 Meters



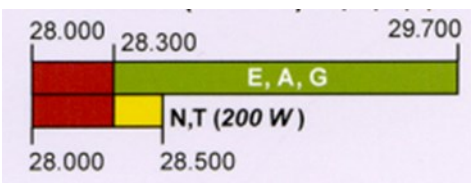
21.000-21.450 MHz.: A lot like 20 meters, but a bit more flaky. 15 meters is more influenced by the sunspot cycle. Much less night time activity than 20 meters, but at the peak of the sunspot cycle, 15 can provide much greater distances! On the down side, at the bottom of the cycle, 15 may not be open for days.

12 Meters



24.890-24.990 MHz.: 12 Meters is very heavily influenced by the sunspot cycle. At the bottom of the cycle it is suitable only for very short distance ground-wave communications only, for long periods of time. At the peak of the cycle it is capable of communications over thousands of miles with a minimum of equipment. Another nice mobile band when conditions are right.

10 Meters



28.000-29.7000 MHz.: This can be a FUN band, when it is open!

This is the HF band most heavily affected by sunspots, and the sunspot cycle. It can be erratic and exciting at the same time, with lots of DX for the QSL hunter, or just as a fun band. Minimum power and simple antennas can bring you a hundred countries in a short period of time when the sunspot cycle is rising towards it's peak. Five watts or even less can work half way around the world!. Ground wave coverage is 25 miles or so. Lots of beacon stations worldwide for you DX hunters. If you can hear beacons that run very low power on 10 Meters, there is an opening to that part of the world.



There you have it. Your HF amateur radio allotted spectrum at your fingertips. Get on the air, and be radio active.

73,
AAØJK
Frederick Hart (elmer@w0tx.org)

ANTENNAS ON THEIR 3RD HARMONIC

By BILL RINKER, W6OAV

Question

Almost all antennas will resonate on their 3rd harmonic frequency. Since this is so, why do 40 meter dipoles work well on 15 meters, their 3rd harmonic, whereas 2 meter verticals do not work well on their 3rd 70 cm harmonic?

Answer

As mentioned above, almost all antennas will resonate on their 3rd harmonic. If the antenna is horizontal, the resultant 3rd harmonic radiation pattern will be very efficient. However, if the antenna is vertical, the resultant 3rd harmonic radiation pattern will not be very efficient.

Figures 1 and 2 show why the above is true. Figure 1 shows the radiation patterns of a 40 meter signal and its 3rd harmonic 15 meter signal from a 40 meter horizontal dipole. The two low 15 meter lobes are very good for long range communications. Figure 2 shows the radiation patterns of a 2 meter signal and its 3rd harmonic 70 cm signal from a 2 meter 1/4λ vertical antenna. Note that the 70 cm main lobe is 20 degrees higher than the 2 meter main lobe which isn't good for local communications. This means a loss of 4 to 6 dB in the horizontal plane compared to UHF radiation from a UHF 1/4λ vertical. The latter would be identical to the 2 meter pattern in Figure 2.

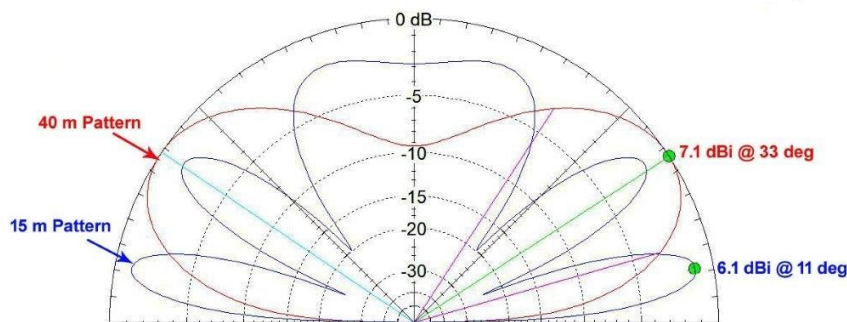


Figure 1 - Comparison of 40 meter and 15 meter patterns on a 40 meter horizontal dipole

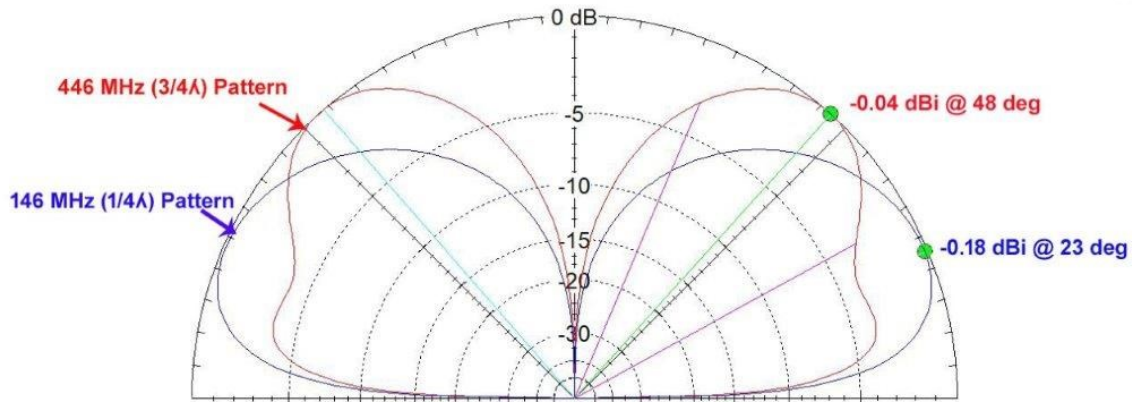


Figure 2 - Comparison of 146 MHz and 446 MHz on a 2 meter $1/4\lambda$ vertical groundplane

Figure 3 shows why the radiation angle is so different when a 70 cm signal is applied to a 2 meter $1/4\lambda$ vertical. The top $1/2\lambda$ of the signal is out of phase with that of the bottom part of the $1/4\lambda$ signal. This means that cancellation results in the radiation pattern and most of the radiation occurs at about 48 degrees. Thus a 2 meter vertical can be made to work at its 3rd harmonic but its UHF performance will not be the best at great distances. However, if you desire a simple small dual band antenna and your operation can tolerate the higher UHF radiation pattern from a 2 meter $1/4\lambda$ vertical, then use it. Tune the vertical to the high end of 2 meters. This will provide a good SWR on both bands.

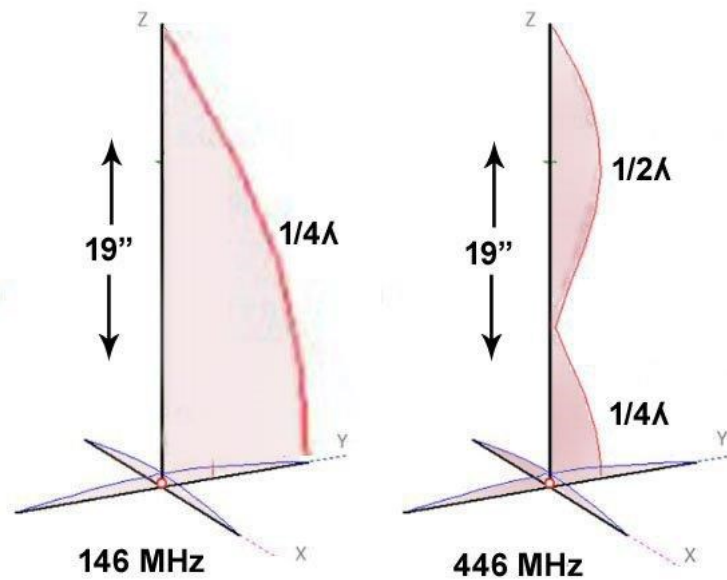


Figure 3 - 2m and 70cm on a 2m $1/4\lambda$ vertical

There is a good discussion about using a $1/4\lambda$ 2 meter vertical on 70 cm at: <https://forums.radioreference.com/threads/transmitting-on-70cm-with-a-2m-antenna.71741/>

450+ AMATEUR RADIO LINKS

BY BILL RINKER, W6OAV

Courtesy of the Kansas Amateur Radio group, the link below provides access to over 450 amateur radio web sites. The web site is listed as the largest ad-free ham linking site on the web. It is definitely worth visiting! <https://ksarrl.org/deeplink/>

DO I NEED A BALUN?

BY BILL RINKER, W6OAV

Is a balun really necessary for a resonant dipole? The lack of a balun can cause:
 Higher local noise pickup by the coax.
 The RF radiation from the coax.

Check out IZ2UUF's YouTube video titled "To Balun or Not to Balun" at the link below. He uses test equipment to demonstrate the effects listed above. <https://www.iz2uuf.net/wp/index.php/2016/08/19/to-balun-or-not-to-balun/>

OTHR SYSTEMS

BY BILL RINKER, W6OAV

Hams are noticing a lot of strange HF digital signals that are not of ham origination. Many of these signals are from Over the Horizon Radar (OTHR) systems. These signals occur in the 3–30 MHz range and allow detection of objects (planes, missiles, boats, etc) from approximately 620 to 2500 miles distant.

So, how does OTHR work? Referencing Figure 1, a high power transmitter, using a very large high gain antenna, emits a very narrow low angle HF digital beam. Some of the digital beam refracts down from the F ionosphere which varies between 160 and 250 miles above the earth. A weak echo (back scatter) signal from the target returns to a high gain receiving antenna via the same route. Figure 2 shows part of the large antenna system of the Container (29B6) OTHR system located in Russia. The transmitter antenna array is 1443 feet wide and 98 feet high. There are three receiver antenna arrays which are each 656 feet wide and 98 feet high. (What a ham station these antennas would make!).

Since the F layer's height and maximum useable frequency (MUF) characteristics change with time, the OTHR system adjusts the transmitter's radiation angle and the transmitter's frequency based on data from a companion specialized radar system. This companion radar system transmits radar signals straight up at various frequencies. The radar reflections determine the height of the F layer and the (MUF) over time.

Samples of many OTHR signals can be heard and seen at: <https://www.sigidwiki.com/wiki/Category:Radar>
 A detailed list of OTHRs and their frequencies can be found at:
<https://www.iaru-r1.org/wp-content/uploads/2021/03/IARUMS-Monthly-Newsletter-21-02.pdf>

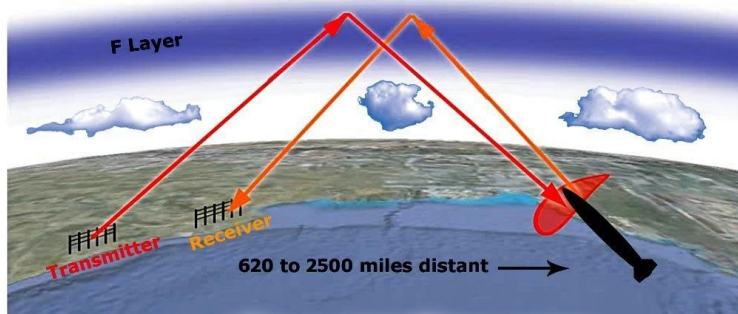


Figure 1 - Over the horizon radar



Figure 2 - A Container (29B6) OTHR receive antenna

SOLAR GEOPHYSICAL ACTIVITY REPORT

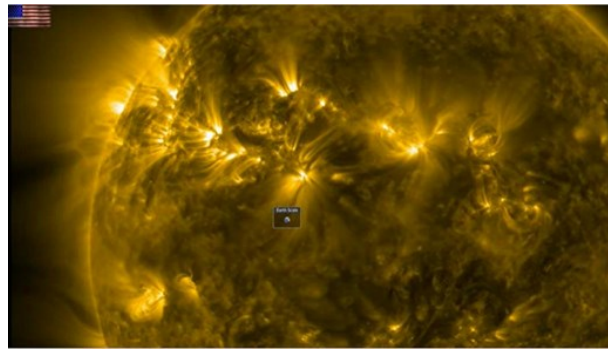
PROVIDED BY FRED HART, AA0JK



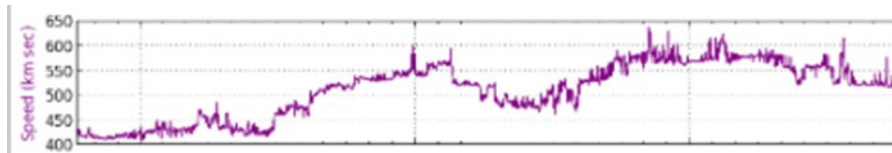
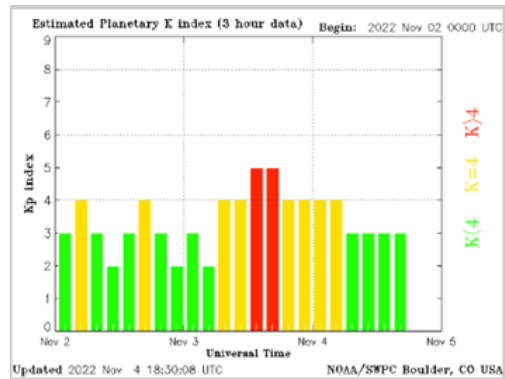
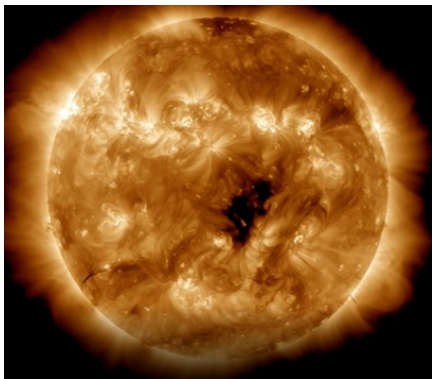
We did not see any significant development in sunspot activity, solar flaring, or earth-directed eruptions over the last few days of October.

There was good reason though, to keep an eye on the sun due to the sunspots beneath several bright coronal and umbral magnetic fields. The story that would not disappoint, was the central coronal hole as earth would exit the previous solar wind stream, a phi angle shift had reignited a bit of geomagnetic instability. Nothing major, but it would be a preconditioning for the magnetosphere to impact a coronal hole turning through center disc. A good chance for more geomagnetic storm activity to follow in the latter half of the following week.





November 4th - Earth was seeing G1-class geomagnetic storms on November 4th and 5th, as Earth continued to pass through a stream of fast-moving solar wind. The gaseous material was flowing from an equatorial hole in the sun's atmosphere.



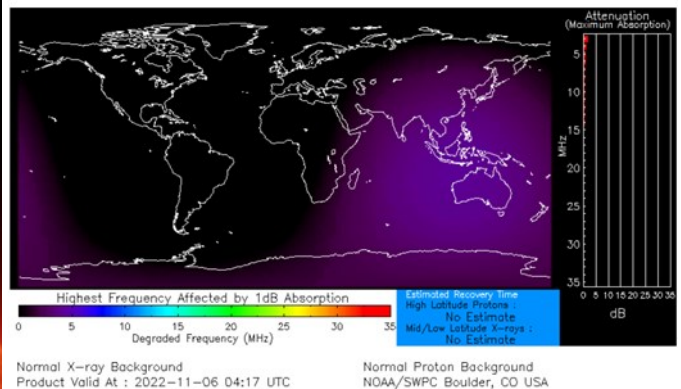
Elevated solar wind speed boosts Kp index to Kp 5 levels.

HF Conditions		
Band	Day	Night
80n-40n	Poor	Fair
30n-20n	Good	Good
17n-15n	Good	Good
12n-10n	Fair	Poor
Geomag Field	UNSETTLD	
Sig Noise Lvl	32-33	
MUF US Boulder	35.13	
Solar Flare Prb	25%	

November 6th



Radio Blackout



w.n0nbl.com

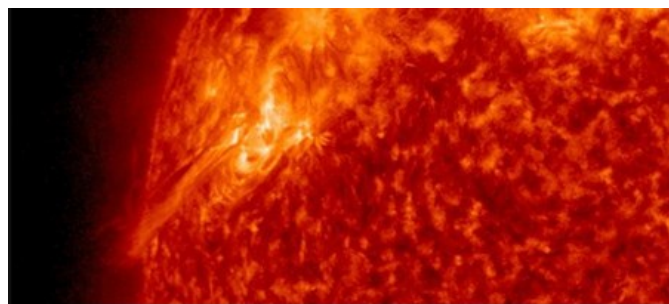
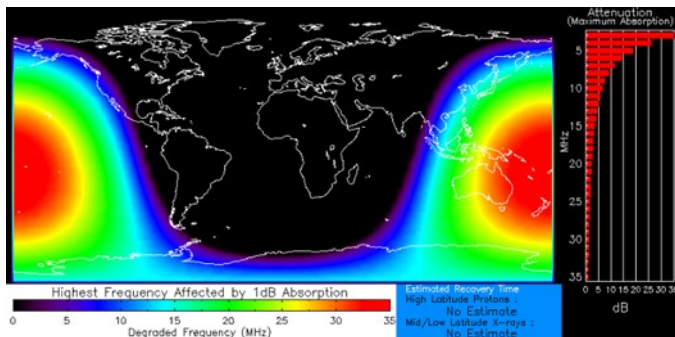
HF Band	Day	Night
80m-40m	Fair	Good
30m-20m	Good	Good
17m-15m	Good	Good
12m-10m	Fair	Poor
Geomag Field INACTIVE		
Sig Noise Lvl	30-51	
MUF US Boulder	31.56	
Solar Flare Prb	50%	

© Paul L. Herrman 2021

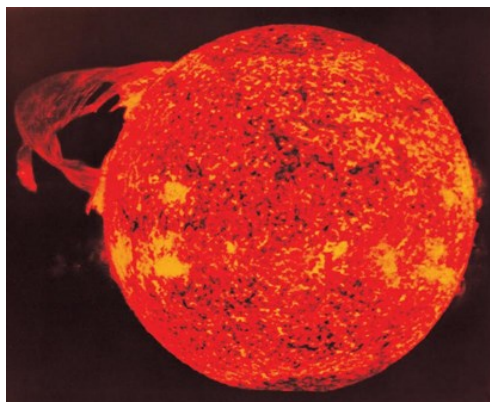
06 Nov 2022 1609 GMT

SFI	131	SN	58
A	10	K	0 / PIntry
X-Ray	B5.1		
304A	142.4 @ SEM		
Ptn Flx	16		
Elc Flx	1280		
Aurora	3/n=1.99		
Aur Lat	65.6°		
Bz	0.5	SW	376.7

November 7th - RADIO BLACKOUT

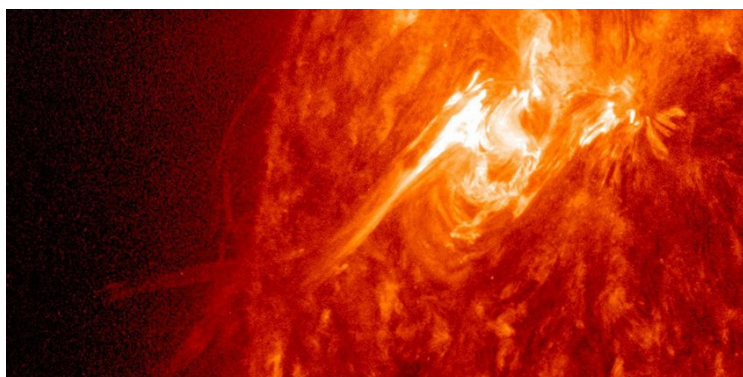


Sunspot AR3141 exploded on November 7th (0011 UTC), producing an impulsive M5-class solar flare. Radiation ionized the top of Earth's atmosphere, and caused a shortwave radio blackout over the South Pacific, including part of Australia, and all of New Zealand.

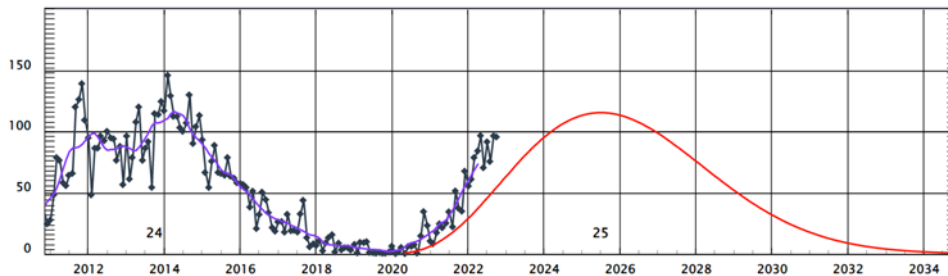


The Sun is up from its nap! An M5.2 flare came from AR3141 at the beginning of Nov. 7 at 00:11 UTC.

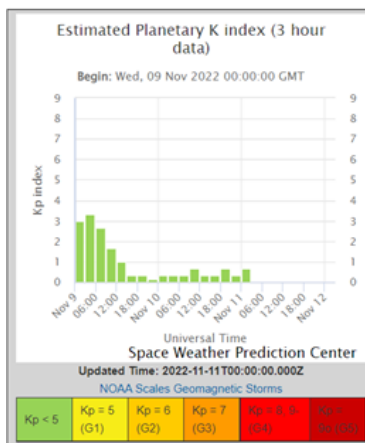
Monday, 7 November 2022 16:35 UTC



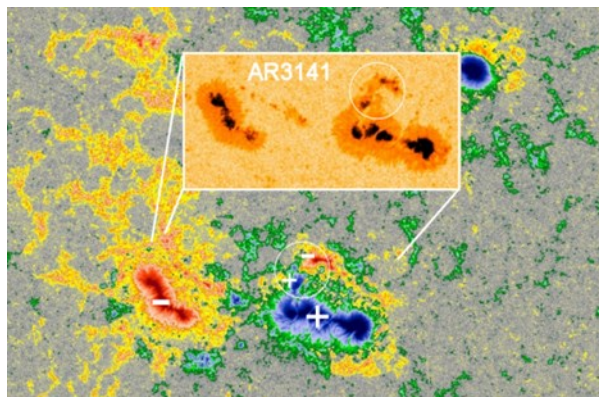
Quite the surprise today! Sunspot region 3141 unexpectedly produced an M5.2 solar flare (R2-moderate radio blackout) that peaked at 00:11 UTC. The solar flare was however impulsive which means it was very short in duration. The resulting coronal mass ejection was very minor and not aimed at Earth.



ISES Solar Cycle Sunspot Number Progression



November 11th - A sunspot within a sunspot

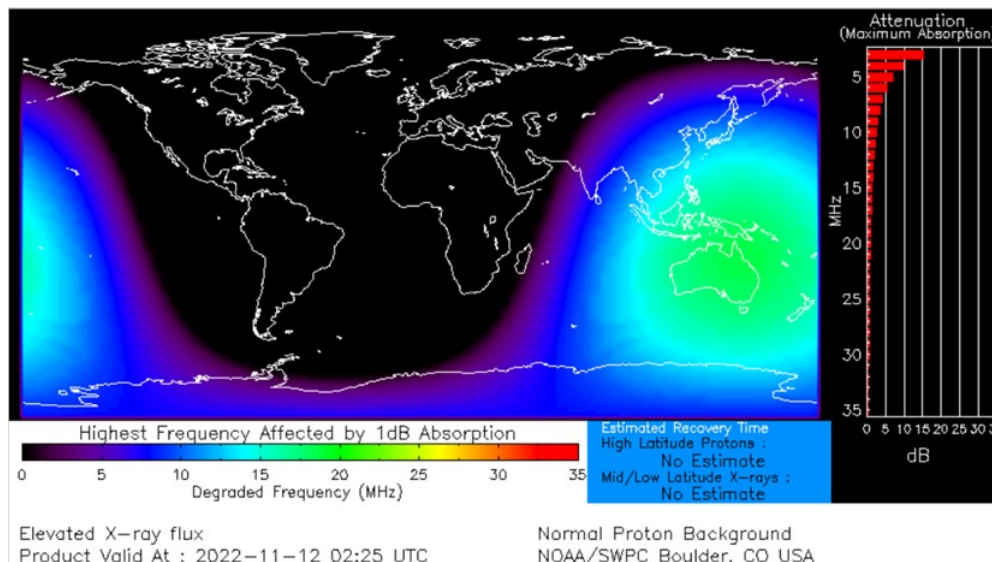


The sunspot was sprouting a little version of itself on its shoulder. The circled region in this magnetogram is, essentially, an extra sunspot.

The extra magnetic poles are in close proximity to AR3141's primary core, an arrangement which makes the ensemble unstable. Analysts call this a 'delta-class' magnetic field; it poses a threat for strong X-class solar flares.

The Radio Sun: 10.7 cm flux: 139 sfu

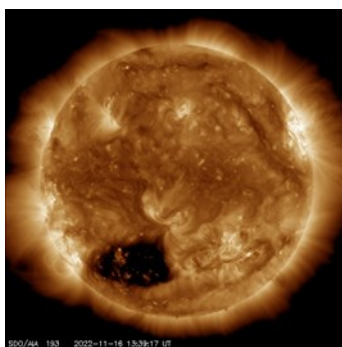
D-Region Absorption



HF Radio Black-Out. November 12th 02:25 Z time.

The operational impact of the solar X-ray flux and SEP (Solar Energetic Particle) events on HF radio communication. Long-range communications using high frequency (HF) radio waves (3 - 30 MHz) depend on reflection of the signals in the ionosphere. Radio waves are typically reflected near the peak of the F2 layer (~300 km altitude), but along the path to the F2 peak and back the radio wave signal suffers attenuation due to absorption by the intervening ionosphere. The D-Region Absorption Prediction model is used as guidance to understand the HF radio degradation and blackouts this can cause.

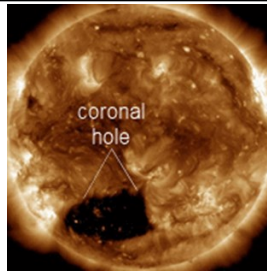
November 16th



SDO/AIA 193

There had been no significant solar flares, plasma eruptions, or solar wind disruptions. Being watched at the time were large incoming plasma filaments on the south. The area had survived the trek around the back side of the sun and now was again coming around to face earth. Solar wind was calm, but expected to become enhanced over the coming weekend when a stream was expected to arrive from the sizable opening. A significantly enhanced stream was expected.

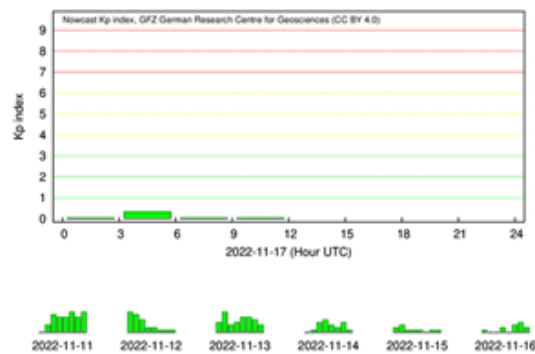
Sun spots that had produced m-class flares the previous week were departing on the north. A new group of active regions were being watched as they were becoming visible on the incoming southern side of the solar disc. They were providing evidence of their potential with the umbral and coronal magnet fields.



Credit: SDO/AIA

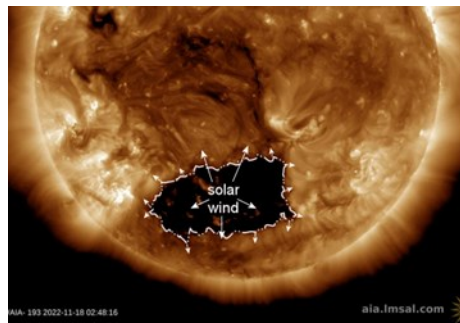
Solar wind flowing from this southern coronal hole was forecast to reach Earth on November 20th or 21st.

The Radio Sun: 10.7 cm flux: 134 sfu

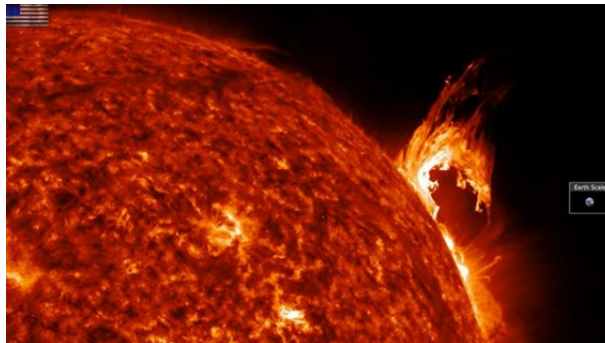


Planetary K-index Was: Kp= 0.33 quiet.

November 18th

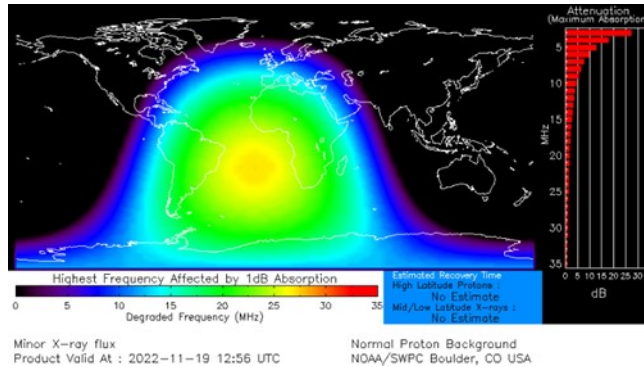


A large dark coronal hole on the south was the most prominent feature. Bright active regions had no considerable solar flares from them. A tiny CME erupted from a C-Class flare at a minor active region.



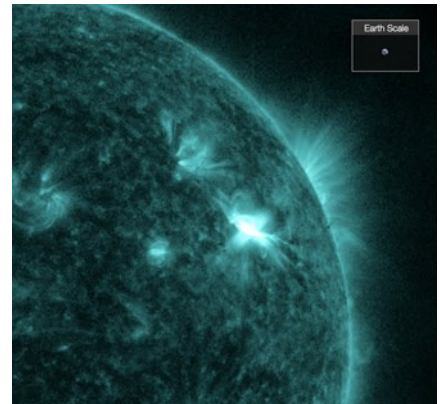
A plasma eruption on the northern departing quadrant at the limb, but the corona contained most of this event with nearly all the plasma falling back down to the surface.

November 20th - Sunspot AR3150 exploded on November 19th (12:56 UT), producing an M1-class solar flare. NASA's Solar Dynamics Observatory recorded a shock wave emerging from the blast site at 930 km/s (2 million mph):



The Pulse of extreme UV radiation from the flare ionized Earth's upper atmosphere, causing a shortwave radio blackout over the south Atlantic Ocean. Aviators, mariners and amateur radio operators may have noticed signals below 15 MHz fading for as much as an hour after the flare.

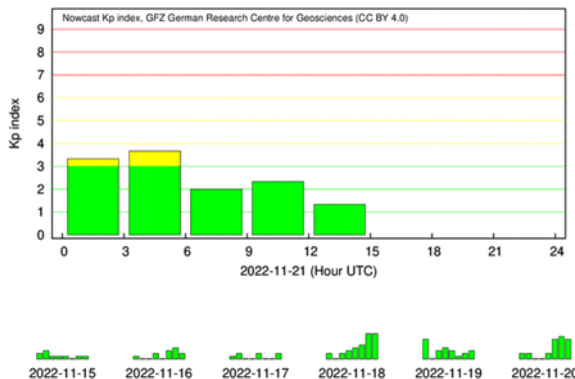
Bright spot near the center was an M class solar flare. It produced a small coronal mass ejection, the third in 2 days. Earth was expected to have minor geomagnetic activity over the following weekend.



Solar Wind Speed:



Kp index:

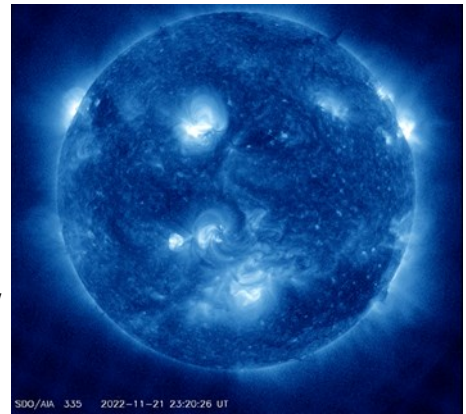


HF Band Conditions:



HF Conditions		
Band	Day	Night
80n-40n	Fair	Good
30n-20n	Good	Good
17n-15n	Fair	Fair
12n-10n	Poor	Poor
Geomag Field QUIET		
Sig Noise Lvl	S1-S2	
MUF US Boulder	9.55	
Solar Flare Prb	31%	

Solar wind died down, the geomagnetic activity died down, there was no significant solar eruptions. C-Class flaring continued but it was at the near equatorial region just south of the equator. It would continue to be monitoring the sunspots, but again don't expect much for several more weeks when the 5.9 month activity will peak again. Minor uptick expected next month.



Forecast: Solar-Geophysical Activity, Issued: 2022 November 21 2200 UTC. Prepared jointly by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center, and the U.S. Air Force. Solar activity has been at low levels. The largest solar event of the period was a C2 event observed at 21/0342Z from Region 3149 (N22E10). There are currently 5 numbered sunspot regions on the disk. Solar Activity Forecast: Solar activity is expected to be very low with a chance for a C-class flares and a slight chance for an M-class flare.

Solar wind speed reached a peak of 469 km/s at 21/0946Z.

NOAA Radio Blackout Activity and Forecast: No radio blackouts were observed over the past 24 hours.

No Radio Blackouts Forecast.

73,
Fred
AA0JK



The Denver Radio Club
is an ARRL Special Service Club

Support your hobby and join the
ARRL today!

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



DRC's Trading Post

Don't forget you can find **locally-sourced, ham-grown** merchandise at:
w0tx.org/trade

ATTENTION

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

PAST ROUND TABLE PAGES

PROVIDED BY WOODY LINWOOD, W0UI

From the November 1960 edition.

More "WORKABLE WATTS" per dollar

from **GLOBE electronics**

The World's Fastest Growing Line of Amateur Radio Equipment



Globe King 500C
 Completely Remounted
 W/T: \$798.00



Sidebander DSB-100
 100w PEP DSB Input, Suppressed Carrier
 60w AM, 50w CW
 W/T: \$128.95
 Kit: \$115.95



Globe Linear LA-1
 W/T: \$124.95 Kit: \$99.95



Globe Champion 300A
 W/T: \$449.00
 Kit: \$399.00



Globe's VOX Model 10
 W/T: \$24.95



Plate Modulator UM-1
 W/T: \$69.95
 Kit: \$59.95



Globe Scout 680A
 W/T: \$119.95
 Kit: \$79.95



VFO 755A
 W/T: \$69.95
 Kit: \$49.95



VFO 6-2
 W/T: \$69.95
 Kit: \$49.95



Screen Modulator Kit
 Kit: \$11.95



Globe Chief 90A
 W/T: \$74.95
 Kit: \$59.95



Power Attenuator PA-1
 W/T: \$10.95



Globe Hi-Bander
 W/T: \$149.95 Kit: \$129.95



Globe Matcher Sr.
 W/T: \$79.95
 Kit: \$69.95



Power Booster PB-1
 W/T: \$27.95 Kit: \$19.95



Globe Matcher Jr., AT-3
 W/T: \$15.95 Kit: \$11.95



Speech Booster FCL-1
 W/T: \$24.95 Kit: \$19.95

RADIO PRODUCTS SALES CO.

1237 16th Street Denver 2, Colorado CH 4-6591

Page Five

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
[ETSAA ETHIOPIA](#)

THE ROUND TABLE ARCHIVE

Go to: w0tx.org/roundtable

THE ROUND TABLE ARTICLE INDEX

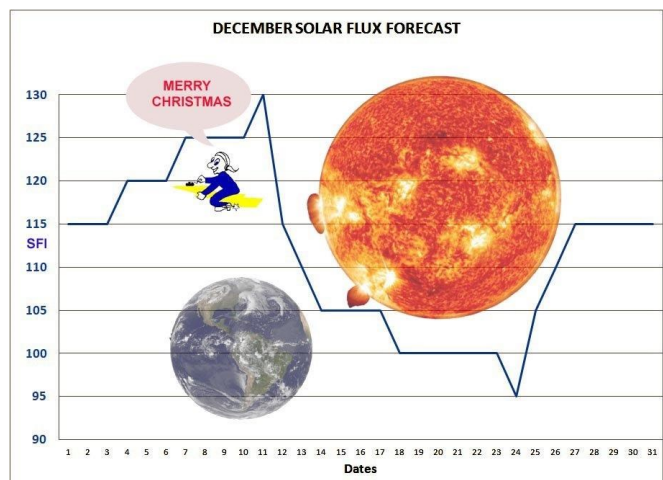
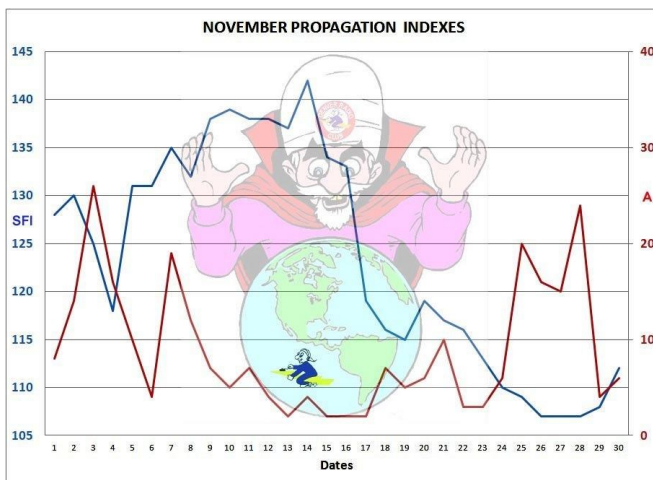
Go to: w0tx.org/RoundtableArchive/-RoundTables-Index.pdf

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
NCARC WinterHamfest	1/21/23	Loveland, CO	ncarc.net/node/68
The Swapfest	2/19/23	Brighton, CO	mham.org/swapfest

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
----------------	------------	----------	-----------------	-------

None listed.

See contestcalendar.com/contestcal.html for a larger QSO parties list.

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	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

**HAM
RADIO
OUTLET**

NOBODY BEATS AN HRO DEAL!

COME VISIT US AT
8400 E ILIFF AVE #9, DENVER, CO 80231
 TOLL FREE: **800.444.9476** | DIRECT: **303.745.7373** | EMAIL: **DENVER@HAMRADIO.COM**
HAMRADIO.COM

DECEMBER 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	2 160 Meter - Begins 2200 UTC	3	
4 160 Meter - Ends 1559 UTC	5	6	7 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)  Full Moon	8	9	10 10 Meter - Begins 0000 UTC	
11 10 Meter - Ends 2359 UTC	12	13	14 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	15	16  Last Quarter	17 	
18 Rookie Roundup (CW) - 1800 - 2359 UTC	19 	20	21 DRC Online Meeting Elmer 6 p.m. Meeting 7 p.m.	22	23  New Moon	24	
25 	26	27	28 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	29  First Quarter	30	31	

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

DRC BOARD OF DIRECTORS

President	W0GV	Gerry Villhauer	303-467-0223	president@w0tx.org
Vice-President	K0KPS	Kevin Schmidt	303-475-9234	k0kps@arrl.net
Secretary	WW0LF	Orlen Wolf	303-279-6264	secretary@w0tx.org
Treasurer	N0CRZ	Cathy Villhauer	303-467-0223	treasurer@w0tx.org
Board Member	N0XRX	Mark Thomas	720-438-0848	n0rxr@w0tx.org
Board Member	K1DBC	Doron Ben Chaim	720-254-1561	k1dbc@w0tx.org
Board Member	WG0N	Dave Baysinger	303-987-0246	wq0n@arrl.net
Board Member	KB0CHT	Jeff Irvin	Check Roster	Check Roster

DRC STAFF AND VOLUNTEERS

Benevolent		Carolyn Wolf	303-279-1328	benevolent@w0tx.org
Club Librarian	WG0N	Dave Baysinger	303-987-0246	wq0n@arrl.net
Digital Committee	W6OAV	Bill Rinker	Check Roster	digital@w0tx.org
Education Coordinator	AA0JK	Fred Hart	303-420-3536	elmer@w0tx.org
EmComm Coordinator	KE0HFH	Michael Vespoli	303-215-8862	emcomm@w0tx.org
EmComm Coordinator	AD0UZ	Brennan Pate	Check Roster	emcomm@w0tx.org
Field Day Chairman	K1DBC	Doron Ben Chaim	720-254-1561	k1dbc@w0tx.org
Membership	N0CRZ	Cathy Villhauer	303-467-0223	membership@w0tx.org
Net Control	K0TOR	Jim Beall	303-798-2351	net@w0tx.org
Public Relations	K0AXP	Dave Verlinde	248-515-2371	publicrelations@w0tx.org
RT Managing Editor	AD0UZ	Brennan Pate	Check Roster	roundtable@w0tx.org
RT Associate Editor	W6OAV	Bill Rinker	Check Roster	Check Roster
Hamfest Manager	KE0YKV	Bill Worthington	Check Roster	drcfest@w0tx.org
Tech. Committee Chair				tech@w0tx.org
Trustee	WW0LF	Orlen Wolf	303-279-6264	trustee@w0tx.org
VE Team	KC2CAG	Tom Kocialski	720-284-1911	kc2cag@arrl.net
Website & YouTube	K1DBC	Doron Ben Chaim	720-254-1561	websiteadmin@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 roundtable@w0tx.org.

Subject: I'm located in...

EDITOR'S NOTE © 2022 Denver Radio Club. Articles in the RT may be reprinted with permission for non-commercial or educational use only.

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 roundtable@w0tx.org. The submission deadline is the 25th of the Month. ~ Editor