



# ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917

December 2019

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## PRESIDENT'S MESSAGE

BY GERRY VILLHAUER, W0GV

Hello DRC Members,

I hope you have all had a great Thanksgiving holiday and looking forward to all the activities that come about in December, including the DRC Holiday Party. More on that subject further down the page. The weather has made it a bit difficult getting around and the miserable cold temperatures have not helped the situation for sure. As far out as the forecast goes at this time, it looks better in December.

Our Echolink system on the 449.350 Squaw Mountain repeater has been giving us continued problems after running for many years with few problems. At present the computer is going through a complete rebuild and the RF section is going to be updated also.

Thanks to Dave Feldman, WB0GAZ, for his very interesting presentation on the NANOVNA antenna and vector network analyzer. His presentation was very well prepared and presented, which generated a volume of questions. I plan to order one myself and I know other members that are doing the same. Thanks Dave, GREAT JOB!

Our next big event to end the year is our annual Holiday Party on December 18th. It will be at the same location as last year, Highland Masonic Center, 3550 North Federal Blvd. PLEASE get your reservations in as soon as possible. You will find the reservation form on line at [www.w0tx.org](http://www.w0tx.org). Print off the form, make your meal choices, attach your check (made out to Denver Radio Club) and mail to the address on the form. It is that simple...Please do it soon!

Our program for the Holiday Party is going to be FANTASTIC! Here is a summary of what you will see and hear about.

To The Ends of the Earth...WILD AFRICA

Bet you didn't know...the African continent:

- Is 3 times larger than the entire United States
- Is believed to be the birthplace of humanity
- Is a 20 hour flight from the U.S. (You have to refuel to reach it all.)
- Is home to over 1.2 billion people. (The U.S. has 0.3 billion)
- Extends as far South from the equator as Albuquerque is to the North
- Contains 400,000 elephants, down from 12 million a century ago
- Is inhabited by the fastest land animal, the cheetah. (The second fastest is the Pronghorn that lives near us.)

Also...

- Big wild animals can be visited for less money than you may think.
- Be surprised to learn how guides use 2-way radio to find rare animals.
- How to go, when to go, what to see, what to avoid...How long can you wait to go?

Come along with Rita, N0UEW and Dave Baysinger, WG0N to the wild lands of Tanzania, Botswana, Zambezi, and South Africa to find the answers.

Save December 18th for good food, fellowship, prizes and this fantastic program...All this for 20 dollars per person...Don't Miss It!

**The final day for us to receive your reservation is DECEMBER 11th. NO TICKETS WILL BE SOLD AT THE DOOR!**



(Continued from page 1)

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 Roundtable.

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 personally to make them feel welcome. Welcome to our newest members:

James Pope - KG0PP	Michael Swanger - KD0YPK
Frank Tighe - N0FR	Timothy Brown - KE0YLB
Louis Guido - KE0WIV	Jim Bailey - N0EYZ

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.

**NOVEMBER MEETING - WHAT'D I MISS?**

BY FRED HART, AA0JK

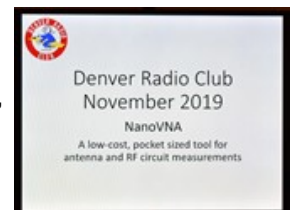
NANOVNA pocket-sized, antenna analyzer and vector network analyzer, presented by Dave Feldman, WB0GAZ.



NANOVNA is a very tiny handheld Vector Network Analyzer. It is a very portable but high-performance vector network analyzer with a standalone LCD display. Great new technology making it affordable to own.

<https://youtu.be/mKi6s3WvBAM>

An Excellent presentation by Dave Feldman, WB0GAZ. Despite poor weather conditions, we had 41 in attendance. Thank you Dave.



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**SPEAKERS NEEDED**

BY BILL RINKER, W6OAV

We are looking for folks who are interested in giving a presentation at any upcoming DRC meeting.

If you are interested, contact Bill at [w6oav@arrl.net](mailto:w6oav@arrl.net).



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**TECHNICAL COMMITTEE REPORT**

BY BILL RINKER, W6OAV

The following is an overview of current issues discussed at the November meeting.

**DRC/TSA Aurora Site**

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

Status: The Board is reviewing the MOU received from the TSA and corresponding with the TSA relative to the installation of wiring and coax runs.

**DRC Repository verses Cloud Services**

Goal: Research using the DRC repository or another cloud service for off premise storing of club records.

Status: AD0UZ has submitted a recommendation to the board. The board is now considering the recommendation.

**Repair the Station 4 Remote Power Control**

Goal: Troubleshoot and repair the system.

Status: Still under investigation. Suspect an Internet issue at Fire station.

**Station 4 Internet?**

Goal: Determine if we can obtain reliable Internet access for the C4FM repeater and for the remote power control system.

Status: Exploring 2 options – Internet from the fire station or microwave via St Anthony to member’s home internet.

**C4FM Repeater – Fusion Network configuration?**

Goal: Remain on the Colorado-Link network or configure the DRC Wires-X Room (assuming Internet available)?

**Replace Echolink Server**

Goal: Replace existing Echolink server which has started to randomly crash.

Status: Work with N0OBA who is building an Echolink server.

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## DRC's HOLIDAY DINNER 2019

PROVIDED BY GERRY VILLHAUER, W0GV AND BILL HESTER, N0LAJ

See the last page of the Roundtable for a printable version of the reservation form. Also, see <https://w0tx.org/holidaydinner.htm> to download the form.

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## LEARNING NET REPORT

BY FRED HART, AA0JK

Our group gathers here to discuss, and respond to topics aimed at enhancing a better understanding of our hobby. The net is open to all and we encourage your participation.



Topics:

- Ham Learning Net: Moving Ham Learning Net from Yahoo Groups to to Groups.io ([HamLearningNet@groups.io](mailto:HamLearningNet@groups.io))
- Handheld radios, using base antennas.
- NANOVNA for HAM Radio Introduction: <https://youtu.be/8kx9SWbEcXI>
- NANOVNA tuning antenna with a transmatch: <https://youtu.be/E3rbJ3VH4c4>
- Hustler 6BT Antennas
- DRC Six Meter Net 53.090 Sunday mornings 10:00AM.
- DRC members home-brew antennas, and their on air performance.

Great topics from our group. We certainly enjoy everyone's participation. Thanks to all. If you are listening and don't yet have your license, you can contact us via [w0tx@w0tx.org](mailto:w0tx@w0tx.org) or [elmer@w0tx.org](mailto:elmer@w0tx.org).

We are always looking for additional net control operators. If you would like to participate we can help you with the basics of becoming a net controller. This is a great opportunity to learn and get experience running a net.

Net controllers are always needed to perform Emergency Communications services. The Amateur Radio Emergency Service® (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment, with their local ARES leadership, for communications duty in the public service when disaster strikes. <http://www.arrl.org/ares>. In the event of emergencies such as floods, fires, or other public service, the amateur radio community is always ready to help. If you have an interest in participating, when the need arises, learn and train now to be prepared. For additional information contact our EmComm Coordinator: Mike Vespoli (KE0HFH) at [emcomm@w0tx.org](mailto:emcomm@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. 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, 100 Hz PL tone & linked to 448.625, 100 Hz PL tone.

(Note: The third Wednesday of the month is devoted to the DRC club meeting. Elmer Session: 6 PM, Main Meeting: 7 PM. See the [W0TX web site](#) for additional information.)

73,

Fred  
AA0JK

**THE 2019 DRC Holiday Party  
is on Wednesday, December 18th, 2019.**



**HIGHLANDS MASONIC CENTER  
3550 North Federal Blvd.  
Denver, CO  
(park and enter on the south side)**

**DOORS OPEN AT 5:15 - DINNER AT 6:00**

**FELLOWSHIP - PRIZE DRAWINGS - PROGRAM**

**CATERED DINNER IS \$20.00 PER PERSON,  
YOUR CHOICE OF ENTREE: ROTISSERIE CHICKEN OR MEATLOAF  
MEAL INCLUDES: TWO SIDES - SALAD - BREAD - DESSERT - BEVERAGE**

**>>> THE DINNER IS BY PRE-PAID ADVANCE RESERVATION ONLY <<<  
Reservations must be mailed by December 11th!**

**Please help us by making your reservation early. Thanks!**

**THE 220 MHZ REPEATER LIVES AGAIN!**

BY BILL RINKER, W6OAV

Several weeks ago the 220 repeater failed. Gerry (W0GV) and Dave (WG0N) stopped by West Metro Fire Station #4 to investigate the failure. Initial inspection did not show the source of the power failure. They removed the repeater and transported it to Dave's home. Later, Jan (WY0J) picked up the repeater and took it to his home for analysis. Jan found several corroded terminals, which, when cleaned up, brought the repeater back to life. Several suspicious solder joints were re-soldered while Jan checked the repeater's performance over a multi-day "burn in" period. On November 20 Jan and Dave reinstalled the repeater at Station 4. It is working again with coverage of the entire metro area!

The Denver Radio Club's 220 band repeater is available for use by listening on 224.38 Mhz and transmitting on 222.78 Mhz with a 100 Hz tone code. The location is on West Alameda Avenue near Green Mountain High School at an antenna altitude of 6080 feet above MSL.

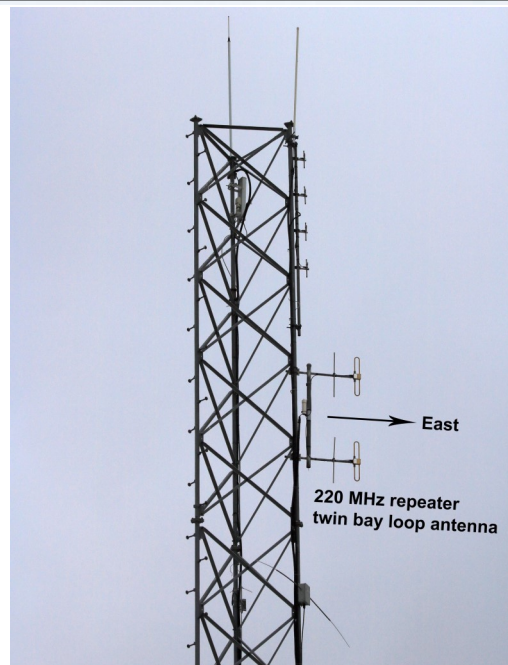


Figure 1 - West Metro Fire Station #4 Tower

## HISTORY OF HAM RADIO

BY BILL RINKER, W6OAV

If you are interested in reading about the very interesting history of ham radio from the 1800s to the 2000s, then click the links below.

LX4SKY's website has a great eighteen chapter document covering the history of ham radio from the 1800s to 2015. It is well written and contains a few audio clips as well. The document is available at:

[www.astrosurf.com/luxorion/qs1-ham-history.htm](http://www.astrosurf.com/luxorion/qs1-ham-history.htm)

Another in depth history of ham radio article was written by Jim, W6CF. It is titled "Ham Radio, 100 Years of Discovery." and was published in the January 2000 issue of QST. It covers ham radio history from the 1800s to 2000. The article is accessible at: [http://www.ar1.org/files/file/About%20ARRL/Ham\\_Radio\\_100\\_Years.pdf](http://www.ar1.org/files/file/About%20ARRL/Ham_Radio_100_Years.pdf)



## TWIT.TV

BY BILL RINKER, W6OAV

While it sounds weird, TWIT TV is a very interesting website for hams and technical folks. This site contains great videos covering topics about amateur radio, Windows and Mac computer hardware/software, how to use tech devices, and much more. The videos are produced weekly. All are available for viewing on your internet equipped TV, computer or on your portable media player. You do not have to register to view the videos.

Figure 1 shows a small sample of the various topics available on TWIT TV.

Go to [https://twit.tv/shows?shows\\_active=1](https://twit.tv/shows?shows_active=1) and you will see a list of topics similar to that shown in Figure 1. Click a topic that interests you to display a list of available videos for that topic.

One topic of special interest to hams is called HAM NATION. It is a weekly ham video show hosted by Bob Heil, K9EID, and covers many ham radio topics. Currently there have been 430 videos. These videos can be accessed directly at <https://twit.tv/shows/ham-nation>.

You may wind up spending many interesting, and educational, hours viewing videos!

(Editor's Note: I've been watching the shows on this site for years. Interesting, varied and educational content done in an entertaining way. High quality video and audio. And, as Bill mentioned, available on a number of devices. You can subscribe to the shows on the Google Play Music app, via RSS or many other formats. Watch on a Roku or via their mobile friendly website, etc. Highly recommended!)

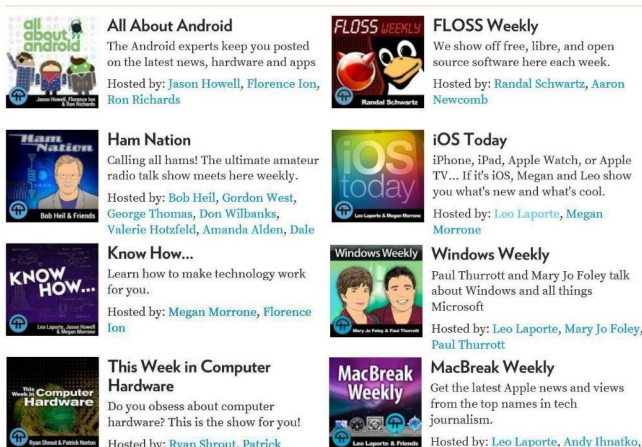
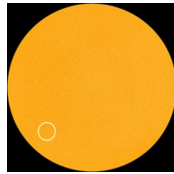


Figure 1 - A sample of videos available on TWIT TV

**SOLAR GEOPHYSICAL ACTIVITY REPORT**

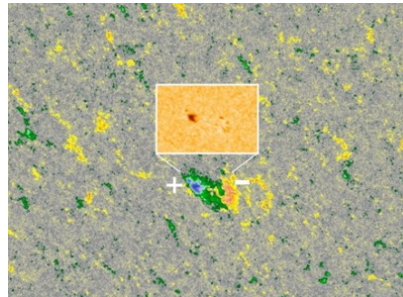
PROVIDED BY FRED HART, AA0JK

November 1st -  
(Credit: SDO/HMI)



November started out with a new sunspot, (AR2750), it was growing at the Sun's southern hemisphere as circled in the location in the above NASA's Solar Dynamics Observatory solar disc map. Its magnetic polarity indicated that it was a member of new Solar Cycle 25.

NASA's magnetic solar disc map inset showing areas polarity.

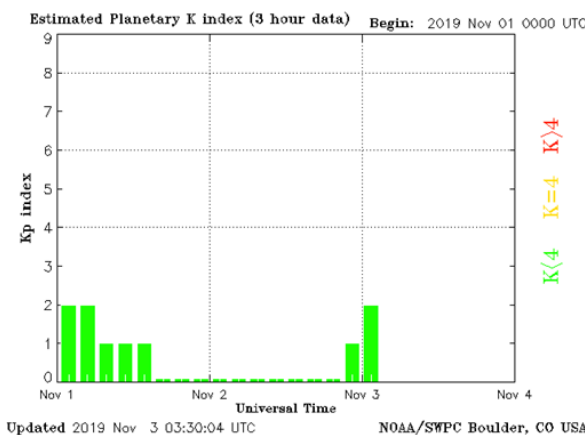


How do we know this sunspot belongs to the next solar cycle? Its magnetic polarity tells us so. Southern sunspots from old Solar Cycle 24 have a -/+ polarity. This sunspot was the opposite: +/- . According to Hale's Law, sunspots switch polarities from one solar cycle to the next. This emerging sunspot was therefore a member of Solar Cycle 25.

This development does not mean Solar Minimum is finished. On the contrary, low solar activity will probably continue for at least another year as Solar Cycle 24 decays and Solar Cycle 25 slowly sputters to life. If forecasters are correct, Solar Cycle 25 sunspots will eventually dominate the solar disk, bringing a new Solar Maximum as early as 2023.

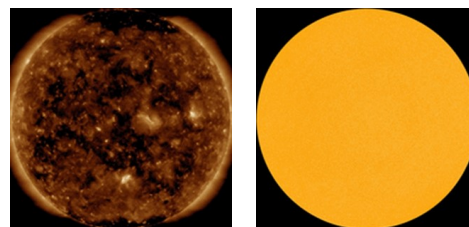
Solar cycle 25 is slowly coming to life. This doesn't happen often during a deep Solar Minimum like the one we're experiencing now. AR2750 is a sign that Solar Minimum won't last forever.

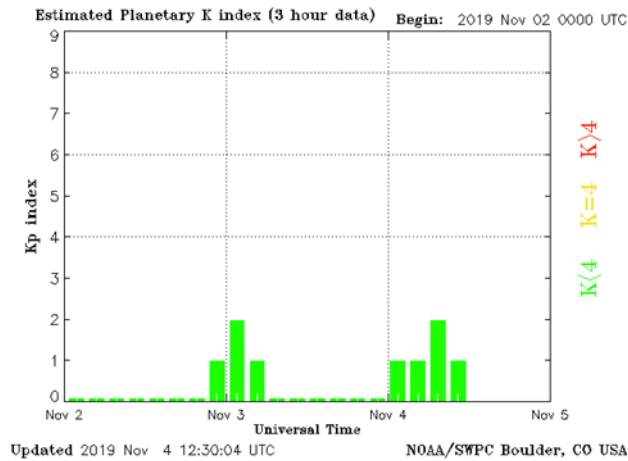
November 4th -



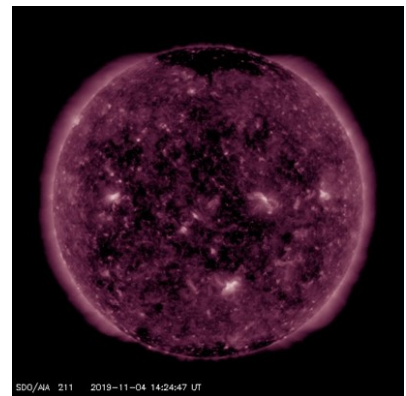
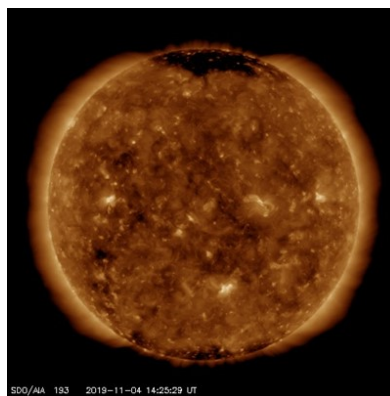
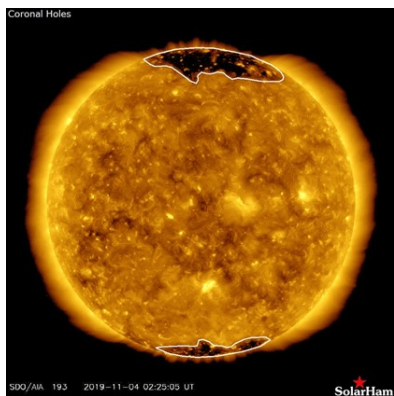
All quiet alert: Solar activity was very low as the solar cycle continues its dip into the nadir of a deep Solar Minimum. There was not even a solar wind stream on the horizon. The next significant gust of solar wind was not expected for at least a week.

Planetary K-index was at : Kp= 0 quiet. (Below Left Picture Credit: SDO/AIA.) There were no significant coronal holes on the Earth-facing side of the solar disc. Coronal holes remained polar confined. The Sun was blank, no sunspots. (Lower Right Picture Credit: SDO/HMI)





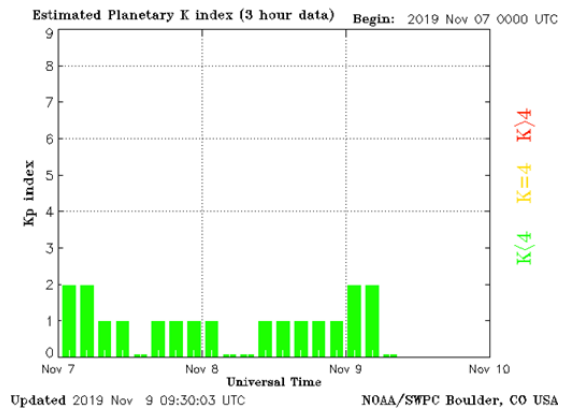
Kp was showing low solar activity. Note days with zero kp.



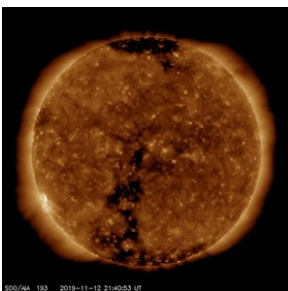
Coronal holes remained polar confined. (Credit: Middle: SDO/AIA 193, Right: SDO/AIA 211)

November 9th - This week solar activity was again quiet for the most part. We had several bright spots, but only one signaling the upcoming Solar Cycle 25. Region AR2750 had the most magnetic complexity of any new sunspots seen thus-far. It even fired off several low level solar flares before receding beneath the Sun's surface.

We have now seen two cycle 25 sunspots that have been increasingly more active than sunspots from the old cycle. This signals that cycle 25 is beginning to take hold, and ramping up.



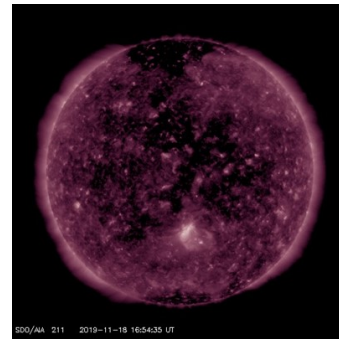
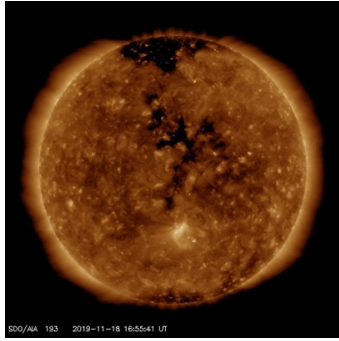
November 13th - Credit: SDO/AIA



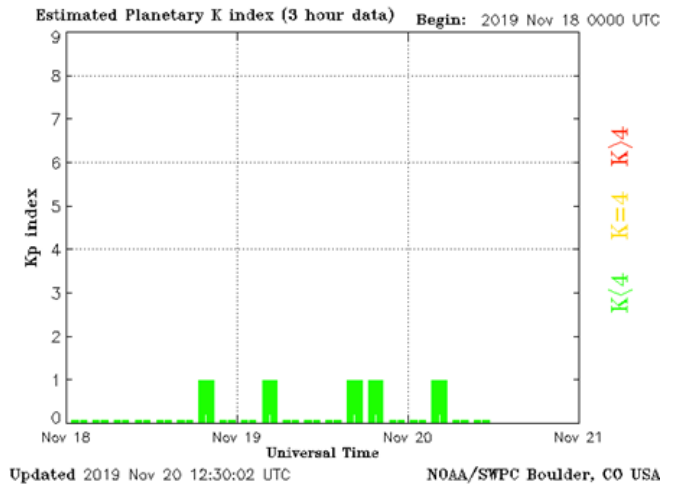
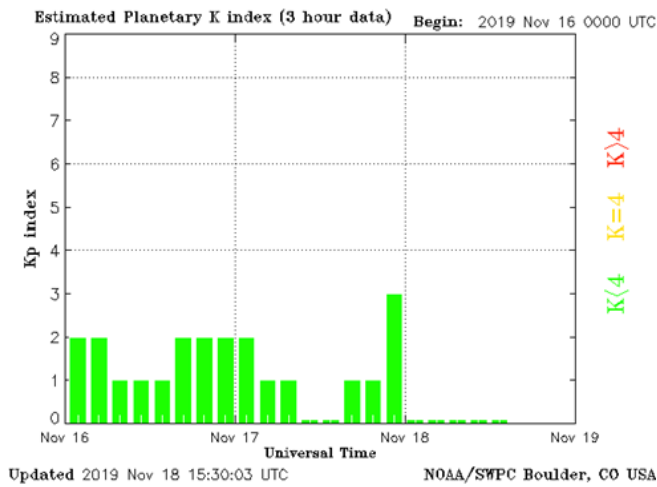
Solar wind was incoming: A hole in the Sun's atmosphere was facing Earth, and spewing a stream of solar wind in our direction. Estimated time of arrival was November 16th. There was a slight chance of G1 class geomagnetic storms when the gaseous material reached Earth.



November 18th - (Credit: Below Left Picture: SDO/AIA 193, Below Right Picture: SDO/AIA 211)



Note the bright spot below the coronal hole at center disk. This bright area failed to break the surface, thus, no sun spots were formed. A minor stream of solar wind buffeted Earth's magnetic field. Solar wind speeds never rose above 450 km/s.



November 20th - A brief rise in the Kp index, then a return to zero levels. There were elevated levels of incoming gamma rays.

Prepared jointly by the U.S. Dept. of Commerce, NOAA, Space Weather Prediction Center. UPDATED 2019 November 22 0030 UTC

Summary: Solar activity was very low and no sunspots were present on the visible disk. No Earth-directed CMEs were observed in available coronagraph imagery.

Forecast: Very low solar activity was expected 22-24 Nov.

73,

Fred  
AA0JK

**QUESTION OF THE MONTH**

BY BILL RINKER, W6OAV

Question

I can successively use my 40 meter dipole on 15 meters, the 3<sup>rd</sup> harmonic of 40 meters. It works well! However, when I use my VHF ground plane on UHF, the 3<sup>rd</sup> harmonic of VHF, the SWR looks fairly good but the performance leaves much to be desired. Why is this?

Answer

There are several issues to discuss here. Figure 1 illustrates the current distributions on a ¼ wavelength (19.2") 2 meter ground plane when either VHF or UHF signals are fed into that antenna. Note that VHF and UHF current distributions at the feed point are almost identical in value and shape indicating approximately equal input efficiencies. The antenna is close to a ¾ wavelength antenna at UHF since a ¾ wavelength antenna at UHF would be 18.6". This is close enough for the antenna to efficiently accept UHF RF power. So, why does the 3<sup>rd</sup> harmonic UHF signal on a VHF antenna not work well while the 3<sup>rd</sup> harmonic 15 meter signal works well on a 40 meter dipole? The 40/15 meter situation is discussed later in this article.

Chart 1 presents the specifications when VHF or UHF signals are fed into a 19.2" vertical ground plane 25' in the air. Note that efficiencies of both configurations are very close. Then why doesn't the UHF configuration work as well as the VHF configuration? Figure 2 illustrates the problem.

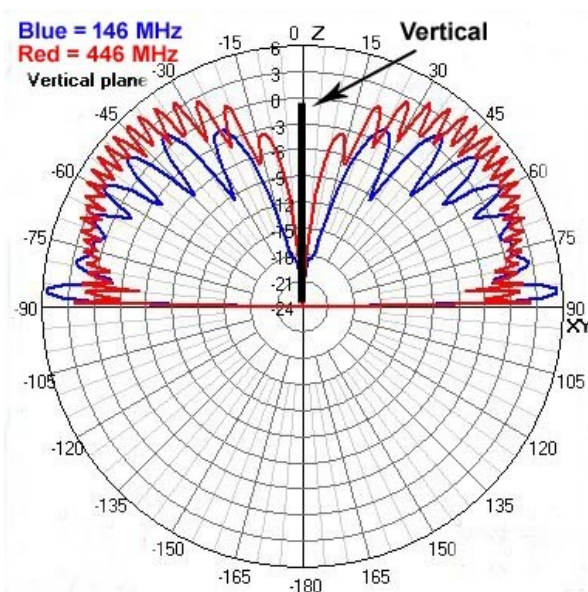
Voltage	48.5 + j0 V	Current	2.06 - j0.07 A
Impedance	23.5 + j0.85	Series comp.	1289 pF
Parallel form	23.6 // j655	Parallel comp.	1.663 pF
S.W.R.50	2.13	Input power	100 W
Efficiency	99.3 %	Structure loss	699.4 mW
Radiat-eff.	54.85 %	Network loss	0 uW
RDF [dB]	8.01	Radiat-power	99.3 W
Environment		<input type="checkbox"/> Loads <input type="checkbox"/> Polar	

**Specifications at 146 MHz**

Filename	GPFLAT2M.out	Frequency	446 Mhz
		Wavelength	0.672 mtr
Voltage	87.2 + j0 V	Current	1.15 - j0.26 A
Impedance	72.4 + j16.2	Series comp.	22.06 pF
Parallel form	76 // j340	Parallel comp.	1.05 pF
S.W.R.50	1.58	Input power	100 W
Efficiency	99.63 %	Structure loss	368.6 mW
Radiat-eff.	72.25 %	Network loss	0 uW
RDF [dB]	7.19	Radiat-power	99.63 W
Environment		<input type="checkbox"/> Loads <input type="checkbox"/> Polar	

**Specifications at 446 MHz**

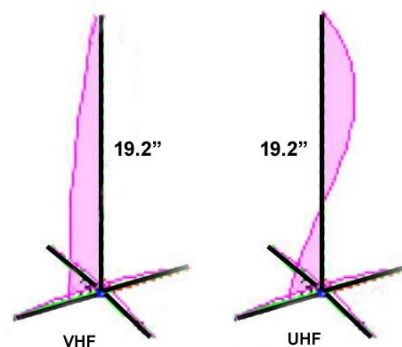
**Chart 1 - 19.2" Vertical on VHF & UHF**



**Figure 2 - Radiation Patterns at VHF/UHF**

Due to the inter-reaction of the ¼ wavelength and ½ wavelength UHF RF currents shown in Figure 1, the UHF radiation pattern lobes are at high angles. Figure 2 shows that at 3 degrees above the horizon the VHF lobe is approximately 6 dB stronger than the UHF lobe. At 10 degrees above the horizon the VHF lobe is about 3 dB stronger than the UHF lobe. Hence, UHF performance at low angles is not good. This same radiation pattern difference would be much more pronounced if the 19.2" vertical were mounted on a mobile which forms a larger ground plane. So, in other words, a 2 meter vertical used on UHF is better for working aircraft and satellites!

A good reference on using a VHF vertical antenna on UHF is WB6IQN's article titled "The DBJ-2: A Portable VHF-UHF Portable Roll-Up J-Pole Antenna for Public Service." This article was published in the March 2007



**Figure 1 - VHF and UHF Current Distributions**

QST.

As a side note, since a VHF J Pole is basically an end VHF dipole, can the J Pole be used on UHF? The same basic issues, as discussed above, exist here as well. John Huggins has a nice article with radiation patterns on this subject at: <https://www.hamradio.me/antennas/can-a-2m-j-pole-be-used-at-440.html>

Now let's discuss the 40/15 meter issue. The reason that using a 40 meter antenna on 15 meters (the 3<sup>rd</sup> harmonic) works so well is because the antenna is normally horizontal and the radiation pattern "distortion" is beneficial. Figure 3 shows the radiation pattern of a 40 meter dipole on 40 meters which antenna is a ¼ wavelength (33') above ground. Note the high angle of radiation and the omni-directional radiation pattern. Figure 4 shows the radiation pattern of the 40 meter dipole when fed with a 15 meter signal. Now, the antenna is effectively more than a ½ wavelength high. Hence, the angle of radiation is much lower and in the form of a figure 8. This is a nice pattern for HF!

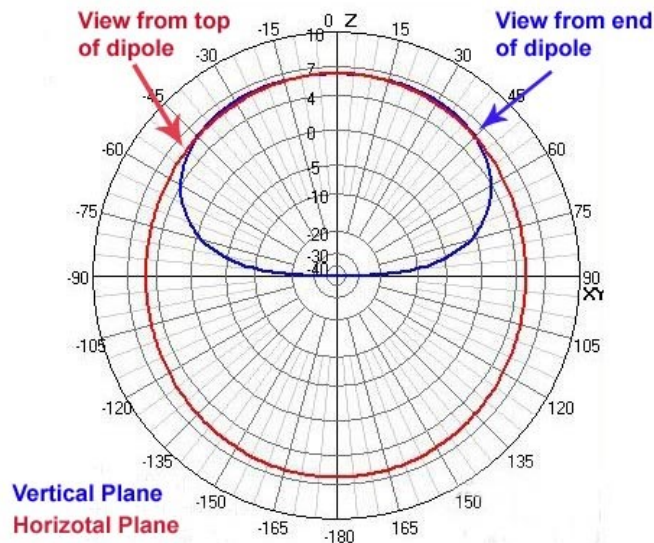


Figure 3 – 40 meter patterns from 40 meter dipole up 33'

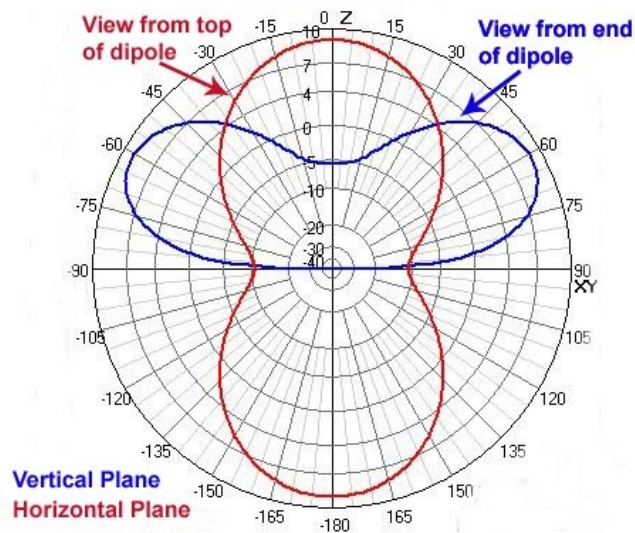


Figure 4 – 15 meter patterns from 40 meter dipole up 33'

**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**  
[CQ Amateur Radio](#)

**THE ROUNDTABLE ARCHIVE**

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

**THE ROUNDTABLE ARTICLE INDEX**

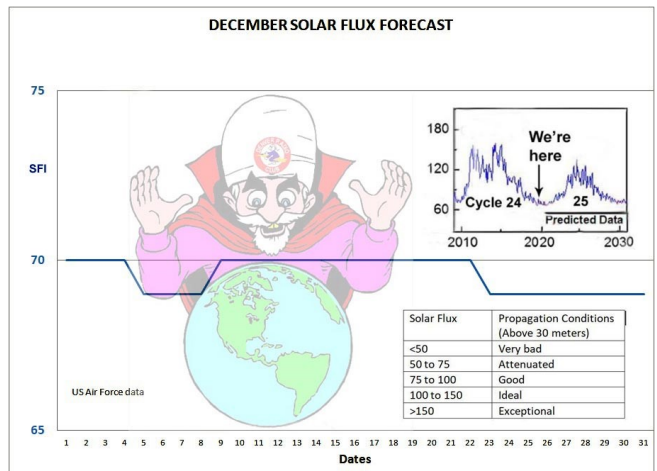
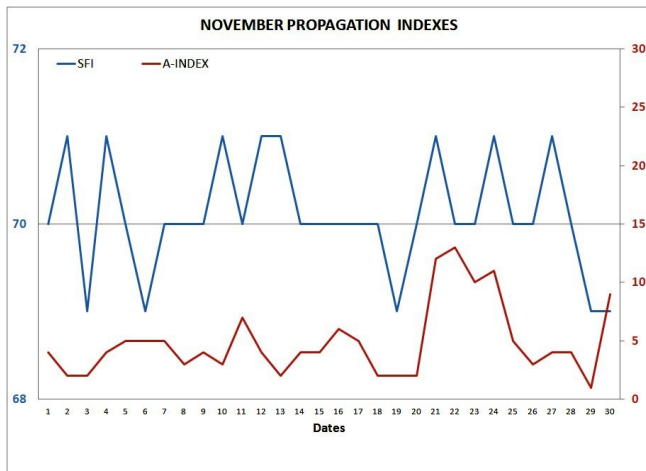
Go to: <http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf>

**PAST & FUTURE PROPAGATION CONDITIONS**

By Bill Rinker, W6OAV

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

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



**UPCOMING EVENTS**  
**HAMFESTS & CONVENTIONS**

Event	Date	Location	Sponsor Website
Winter 2020 Hamfest	01/18/20	Larimer County Fairgrounds, Loveland	<a href="#">Northern Colorado ARC</a>

**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
British Columbia	02/01/2020	02/02/2020	<a href="#">Orca DX and Contest Club</a>	
Minnesota	02/01/2020	02/01/2020	<a href="#">Minnesota Wireless Association</a>	
Vermont	02/01/2020	02/02/2020	<a href="#">Radio Amateurs of Northern Vermont</a>	
South Carolina	02/22/2020	02/23/2020	<a href="#">Columbia Amateur Radio Club</a>	
North Carolina	02/23/2020	02/24/2020	<a href="#">Raleigh Amateur Radio Society</a>	
Idaho	03/08/2020	03/09/2020	<a href="#">Idaho QSO Party</a>	
Wisconsin	03/09/2020	03/10/2020	<a href="#">West Allis Radio Amateur Club</a>	
Oklahoma	03/14/2020	03/15/2020	<a href="#">Oklahoma DX Association</a>	

**ATTENTION**

**SUPPORT THE DRC FROM YOUR AMAZON PURCHASES**

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**DRC REPEATERS**

BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090MHz (-1MHz) 107.2Hz PL	
Packet	145.05MHz<>14.105MHz	2m / 20m gateway. Useable by Technicians on 2m.
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.
70cm	446.7875MHz (-)	BrandMeister Repeater: Slot 1 – Wide Area Traffic, Slot 2 – Local Talk Group 310804



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





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**303-745-7373 800-444-9476**

**24 HOUR FAX 303-745-7394**

**e-mail: denver@hamradio.com**

<b>DECEMBER 2019</b>							<i>DRC Net Sundays at 8:30 p.m. on 145.490 / 448.625 (no PL)</i>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
<b>1</b>	<b>2</b>	<b>3</b>  First Quarter	<b>4</b> <b>Learning Net</b> 7:30 p.m. 145.490 / 448.625 (No PL)	<b>5</b>	<b>6</b> <b>160 meter contest</b> Starts 2200 UTC	<b>7</b>	
<b>8</b> <b>160 meter contest</b> Ends 1600 UTC	<b>9</b>	<b>10</b>	<b>11</b> <b>Learning Net</b> 7:30 p.m. 145.490 / 448.625 (No PL)  Full Moon	<b>12</b>	<b>13</b>	<b>14</b> <b>10 meter contest</b> Starts 0000 UTC	
<b>15</b> <b>10 meter contest</b> Ends 2359 UTC	<b>16</b>	<b>17</b> 	<b>18</b> <b>DRC Annual Holiday Dinner</b> - Highlands Masonic Center Dinner @ 6 PM  Last Quarter	<b>19</b>	<b>20</b>	<b>21</b>	
<b>22</b> <b>Rookie Roundup - CW</b> 1800 - 2359 UTC	<b>23</b>  <small>Illustration © 2019 W0TX</small>	<b>24</b>	<b>25</b>   New Moon	<b>26</b>	<b>27</b>	<b>28</b>	
<b>29</b>	<b>30</b>	<b>31</b>					

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**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](mailto: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](mailto:drc.editor@gmail.com). The submission deadline is the 25th of the Month. ~ Editor



DENVER RADIO CLUB  
2019 HOLIDAY DINNER MEETING  
RESERVATION FORM

Please print out this form, fill it in, and mail it with your check.

THE DEADLINE TO MAIL RESERVATIONS IS DEC. 11TH, 2019 !  
(Please help us by making your reservation early. Thanks!)

Name: \_\_\_\_\_ Call: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone #: \_\_\_\_\_ E-mail: \_\_\_\_\_

Total # of Persons Attending at \$20.00 Each: \_\_\_\_\_

Entrée Choices: # of Rotisserie Chicken: \_\_\_\_\_, # of Meatloaf: \_\_\_\_\_  
(there is only one entrée per person)

Please make your check payable to: The Denver Radio Club

My check is in the amount of: \$\_\_\_\_\_

Please mail this Reservation Form with your Check to:

Gerry Villhauer  
6511 West 74<sup>th</sup> Ave.  
Westminster, CO 80003 – 3129

Thanks for making your reservation. We appreciate your support!