



# ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917

November 2018

## PRESIDENT'S MESSAGE

BY GERRY VILLHAUER, W0GV

Hello DRC Members,

What beautiful weather we are having this week. I always look forward to the "Indian Summer Weather" that we get in November. I sure hope this year is no exception.

**IMPORTANT INFO:** There will NOT be a regular DRC meeting in November. This is because our meeting would be on Thanksgiving Eve.

**MORE IMPORTANT INFO:** There will NOT be a regular DRC meeting in December. Our annual Holiday/Christmas Party will take place of the regular meeting. The party is on Wednesday December 5<sup>th</sup>. See the party announcement and registration form on the website [w0tx.org](http://w0tx.org).

Speaking of our Holiday/Christmas Party; please get your reservations in as early as possible. This really helps us with planning the party. We will have a couple special guests attending and a very interesting general interest program. Come enjoy a great meal, fellowship and prize drawings. Put the date, December 5<sup>th</sup> on your calendar and get your reservation in early! See our webpage [w0tx.org](http://w0tx.org) for information and print off the reservation form. Please understand you MUST have a paid reservation for dinner. NO dinner tickets will be sold at the door. Thank you goes out to Bill Thomas (WT0DX) for a very interesting and well presented program on the FT8 and MSK144 digital modes. These are very popular and interesting digital modes; judging by the amount of questions asked during and after the program. Again, thanks Bill. Great Job!

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



### The DRC needs you!

Please contact W0GV ([w0tx@w0tx.org](mailto:w0tx@w0tx.org)) if you are interested in helping with:

Tower climbers for antenna maintenance: Training will be provided by our experienced tower climbers.

Chairperson for DRC Field Day in 2019: Assistance and guidance will be given to new chairperson. You will have help.

### 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:

Matt Rotter	Ronnie Pitcock - KG0NN
Brandon Newton - KC3DXL	Ross McIntyre - KK0MAC

We have a number of activities throughout the year and we'd like very much for you to participate in serving your community. If you have questions please feel free to ask on any of the repeaters or see the contact information on the last page of this publication.

Also, please join us once a month at the regular club meeting on the 3rd Wednesday at 7:00 p.m. For new hams we have the Elmer session which starts at 6:00 p.m. before the regular meeting.

### TECHNICAL COMMITTEE REPORT

By BILL RINKER, W6OAV

The following is an overview of current issues.

#### DRC/TSA Aurora Site

Goal: Maintain contact with TSA relative to establishing a "communications room" for the DRC.

Status: WW0LF has sent a letter to the TSA describing the services that the DRC can provide and recommendations for the communications equipment and antennas. The TSA has responded with an MOU which the DRC is reviewing.

#### Station 4 Remote Power Control

Goal: Install Internet controlled power outlets.

Status: WG0N has installed an Internet controlled outlet power strip at Station 4. The equipment will be reconfigured and the system tested ASAP.

#### Fusion Repeater WIRES Interface

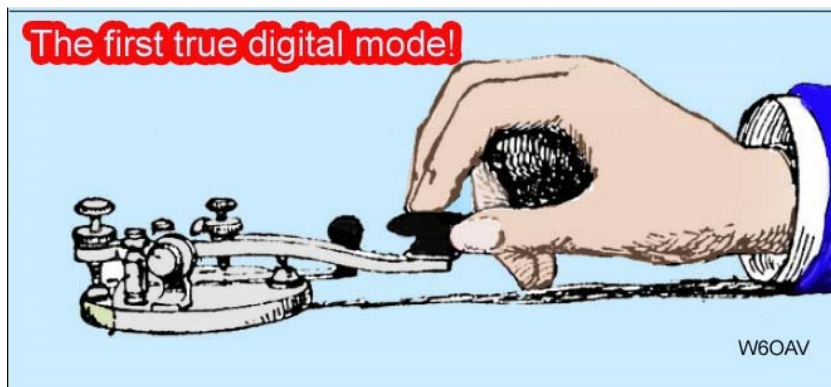
Goal: Train several club members how to program and maintain the Fusion Repeater system.

Status: Pending

#### Check Station 4 and Squaw Antennas

Goal: Inspect antennas before winter sets in.

Status: WG0N will check antennas ASAP.



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**LEARNING NET REPORT**

BY FRED HART, AA0JK

Thanks go out to our Net Controllers: Doron (K1DBC), Larry (K0LAI) and Jim (AD0ZM).



The following topics were discussed this past month:

- Software-defined radio: [https://en.wikipedia.org/wiki/Software-defined\\_radio](https://en.wikipedia.org/wiki/Software-defined_radio)
- Youngblood, Gerald (July 2002), "A Software Defined Radio for the Masses, Part 1" (PDF), QEX, American Radio Relay League: 1–9
- Youngblood, Gerald (Sep–Oct 2002), "A Software Defined Radio for the Masses, Part 2" (PDF), QEX, American Radio Relay League: 10–18
- Youngblood, Gerald (Nov–Dec 2002), "A Software Defined Radio for the Masses, Part 3" (PDF), QEX, American Radio Relay League: 1–10
- Youngblood, Gerald (Mar–Apr 2003), "A Software Defined Radio for the Masses, Part 4" (PDF), QEX, American Radio Relay League: 20–31
- Rick Lindquist; Joel R. Hailas (October 2005). "FlexRadio Systems; SDR-1000 HF+VHF Software Defined Radio Redux". QST. Retrieved 2008-12-07.
- Rick Lindquist Joel R. Hailas, October 2005 *FlexRadio*
- FCC Bombshell on Chinese Handhelds: <https://youtu.be/YG8PU1eG6Cc> (AD0ZM, Jim)
- Handmade Slim Jim Antenna's by N9TAX: <http://www.n9tax.com/Slim%20Jim%20Info.html>
- DX and Band Conditions: Quick Guide to HF Propagation Using Solar Indices, [https://www.qsl.net/w2vtm/hf\\_solar.html](https://www.qsl.net/w2vtm/hf_solar.html)

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. 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 [em-comm@w0tx.org](mailto:em-comm@w0tx.org).

If we don't have the answer here on the net, we have a lot of experienced hams in the club that can help. Questions can also be submitted on the YAHOO Learning Net web page <https://groups.yahoo.com>. Here you will also find information from past activity that you might find of interest.

Getting that first Technician license? Upgrading to General or Extra? We're here to help. We would encourage those who have been Hams for several years to also join us. Your experience and input is welcomed. What topics would you like to discuss? Join us Wednesday nights, 7:30 PM, 145.490 / 448.625.

(Note: The third Wednesday of the month is devoted to the DRC club meeting. See the [W0TX web site](#) for additional information.)

73,

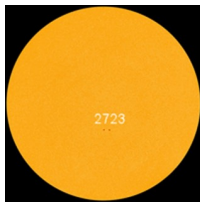
Fred  
AA0JK

## SOLAR UPDATE

PROVIDED BY FRED HART, AA0JK

We see the return of a coronal hole, after its 27 day trip around the Sun, that brought us G-2 Class solar storms last month.

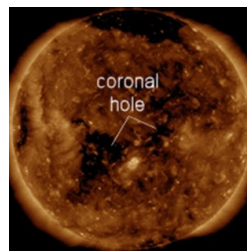
**THE CHILL OF SOLAR MINIMUM:** The Sun is entering a deep Solar Minimum, and Earth's upper atmosphere is responding. Data from NASA's TIMED satellite show that the thermosphere (the uppermost layer of air around our planet) is cooling and shrinking, literally decreasing the radius of the atmosphere. If current trends continue, the thermosphere could set a Space Age record for cold in the months ahead.



*October 1st* - After two weeks of no sunspot activity, AR-2723, a double spot, each the size of Earth, made their appearance. The sunspots magnetic field appeared to be stable, and unlikely to explode.

New sunspot AR2723 had a stable magnetic field that posed little threat for explosive solar flares. Credit: SDO/HMI

A trans-equatorial coronal hole was facing Earth. Enhanced solar wind was expected as early as October 2nd.



Credit: SDO/AIA

Solar Storm Conditions and Aurora 5-Day Outlook		----- Official NOAA 3-day -----				
		Oct 1 Mon	Oct 2 Tue	Oct 3 Wed	Oct 4 Thu	Oct 5 Fri
<b>HIGH LATITUDES</b> 	Active Aurora Possible	Unsettled Aurora Possible	Unsettled Aurora Possible	Unsettled Aurora Possible	Unsettled Aurora Possible	
	40% Major Storm	25% Minor Storm	20% Minor Storm	25% Minor Storm	30% Active	
<b>MID LATITUDES</b> 	Active Aurora Possible	Unsettled Aurora Possible	Unsettled	Unsettled Aurora Possible	Unsettled	
	40% Minor Storm	20% Active	10% Active	20% Active	10% Active	

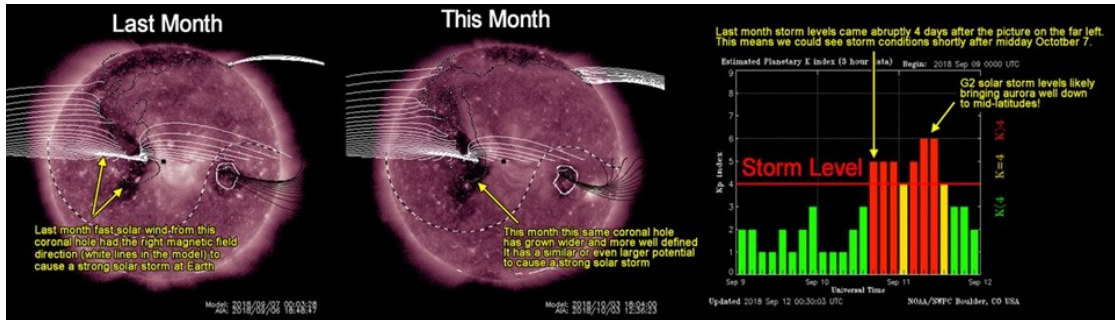
Dr. Tamitha Skov - In each table, top row shows what was expected, bottom showed possible maximum activity for the period.

Solar storm 5-day Outlook presented a bumpy ride for the week as small coronal holes sent pockets of fast wind towards Earth.

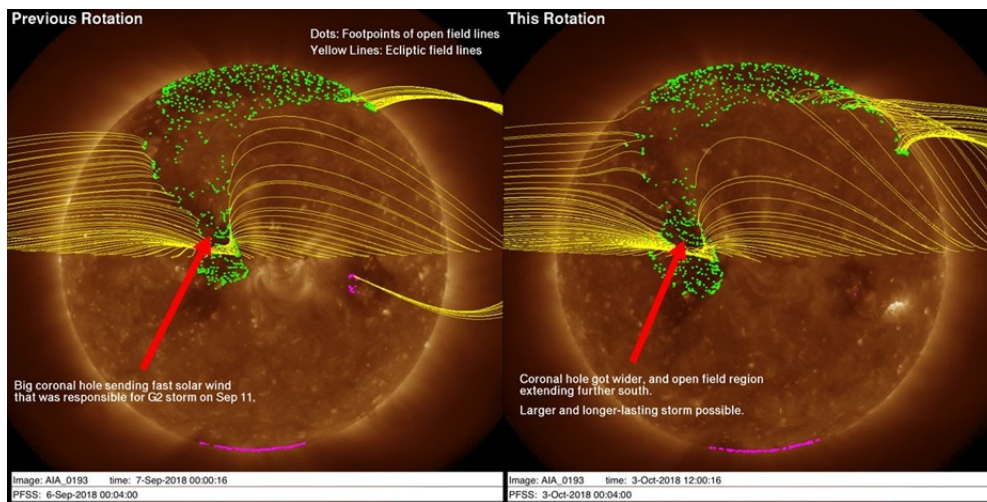
Aftereffects were expected at high-latitudes, disrupting amateur radio and GPS operations.

In January of this year, we launched NASAGOLD to study the upper atmosphere, Earth's interface to space. (<http://nasa.gov/gold>). Its data will complement data from NASAICON, scheduled to launch on October 26th. (<http://nasa.gov/icon>, NASA60th)

<https://twitter.com/i/status/1046870497072439296>



Dr. Tamitha Skov - If history were to repeat its self, we were in for a show! A coronal hole rotating into the Earth-Strike zone was expected to bring G2-level solar-storms beginning midday October 7th. The hole had grown, plus the Fall-Equinox amplified its effects! Mid-latitude Ham Radio, and GPS problems were expected to arise on Earth's night side.

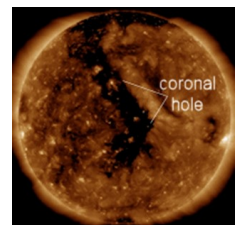


Coronal holes (CHs) were main players of space weather in this phase of the solar cycle. This big CH was expected to cause a G2 (or larger) storm around October 6-7.

Current sunspot count was 14, and only one group, (AR-2723), was on the map. Sunspot count is calculated by counting the number of groups, multiply that by 10, and then add the number of individual spots. One group, 4 spots =  $1 \times 10 + 4 = 14$ .

**October 5th** - Coronal Canyon Faces Earth: A large canyon-shaped hole opened in the Sun's atmosphere, and it was directly facing Earth.

NASA's Solar Dynamics Observatory took this false-color ultraviolet image of the structure on October 5th.



This is a coronal hole, a place in the Sun's atmosphere where magnetic fields open up and allow solar wind to escape. Coronal holes are common, but this one was unusually large. It stretched more than 900,000 km from the Sun's north polar crown across the equator into the Sun's southern hemisphere.

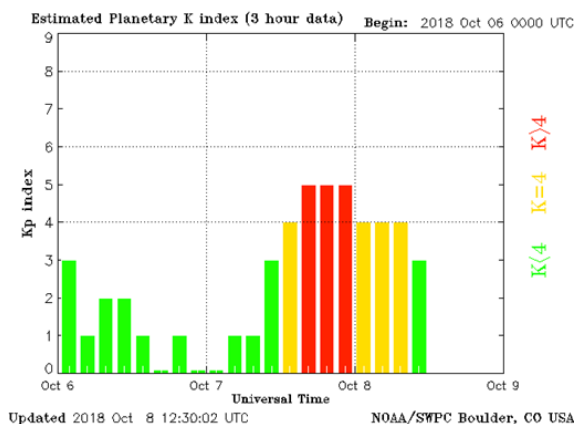
The emerging stream of solar wind would reach Earth on October 7th bringing a 65% chance of minor G1-class geomagnetic storms, according to NOAA.

A coronal hole that sent us a large solar storm 27 days ago, was back, and was expected to do it again. G2-storming levels were expected.

**Week Two**

*October 7th* - The anticipated coronal hole stream was beginning to move past Earth. At the time of this update, the Bz component of the interplanetary magnetic field (IMF) was pointing sharply south (-12nT) and this would increase the chances for a geomagnetic storm. A moderate (G2) storm watch was in effect for the following 24 hours.

Geomagnetic storming was in progress: As predicted, a G1-class geomagnetic storm was in progress on October 7th as Earth entered a fast-moving stream of solar wind. The gaseous material was flowing from a large canyon-shaped hole in the Sun's atmosphere. There was a chance the storm would intensify to category G2 level.



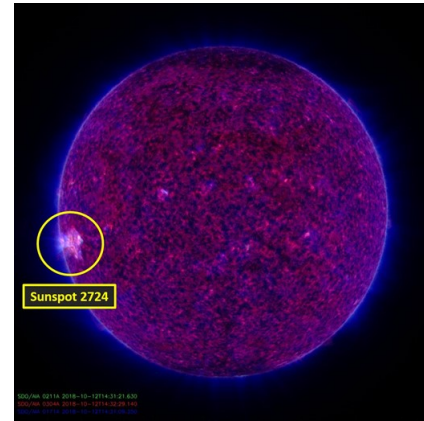
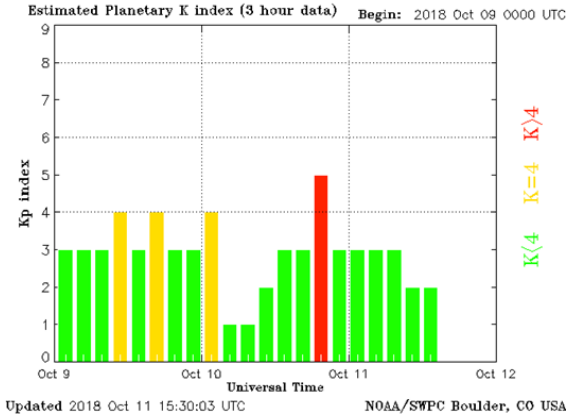
*October 10th* - The solar wind continued to blow: For the 4th day in a row, a stream of solar wind was buffeting Earth's magnetic field. The gaseous material was flowing from a canyon-shaped hole in the Sun's atmosphere. The Earth would exit the stream on October 11th .

**GEOMAGNETIC THUNDER? SOME AURORAS MAKE NOISE:** On October 7th, a solar wind stream hit Earth's magnetic field, sparking a G1-class geomagnetic storm. In southern Finland, the night sky turned green as energetic particles rained down on the upper atmosphere. But there was more to the show than beautiful lights.

"The storm also produced a number of distinctive sounds including crackles and claps". They occurred at about 70 meters above the ground. Temperature inversion layers at that altitude cause a separation of + and - charges in the air. During some geomagnetic storms, the charge separation breaks down, causing air to move and a faint "clap" could be heard. Think of it as geomagnetic thunder.

A spectral analysis of the "thunderclap" (above) shows dominant frequencies between 1 kHz and 2 kHz, squarely in the range of human hearing. You have to be quiet to hear them though.

A geomagnetic storm, by itself, is not enough to produce these thunderclaps. "A strong inversion layer is also required". The inversion layer acts like an electrostatic loudspeaker. Without it there are no sounds. This explains why many geomagnetic storms are silent. The local weather has to be just right, as it was on October 7th.



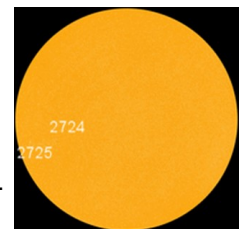
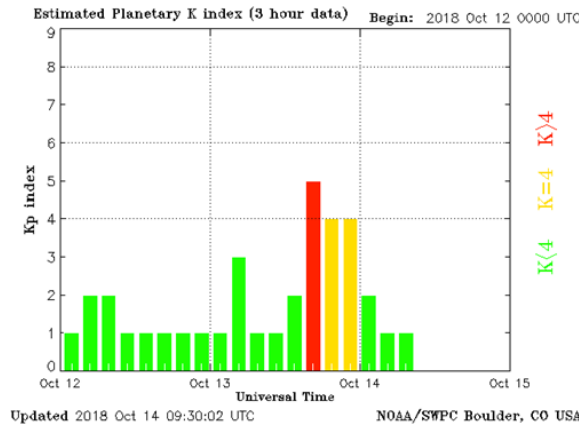
October 12th - About 60% of the days in 2018 have been completely spotless.

On October 12th, there was a new region, AR-2724, rotating onto the Sun's eastern limb and while it didn't appear serious, it was producing some B-Class Flares.

October 13th, a minor G1 Geomagnetic Storm produced an enhanced solar wind stream containing periods of southward Bz.

**Week Three**

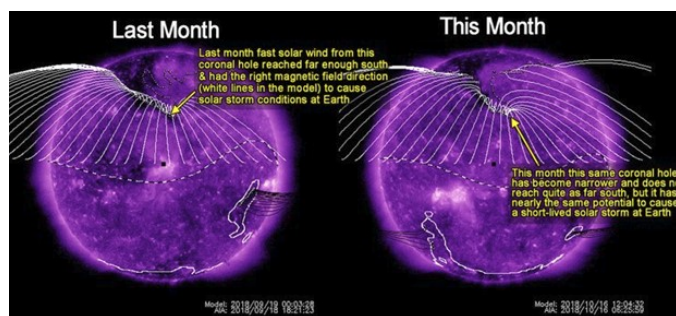
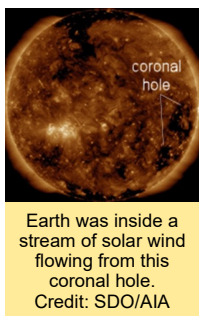
October 14th -



These sunspots were small and posed no threat for strong solar flares. Credit: SDO/HMI

NOAA forecasters said there was a 60% chance of G1-class geomagnetic storms during the late hours of October 14th when a stream of high speed solar wind was expected to hit Earth's magnetic field. The gaseous material was flowing from a ragged hole in the Sun's atmosphere.

October 16th -

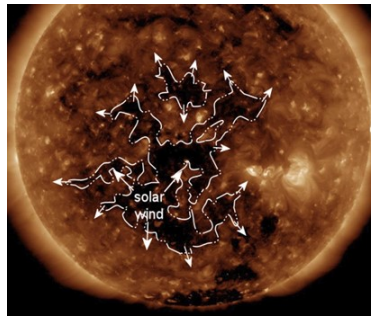
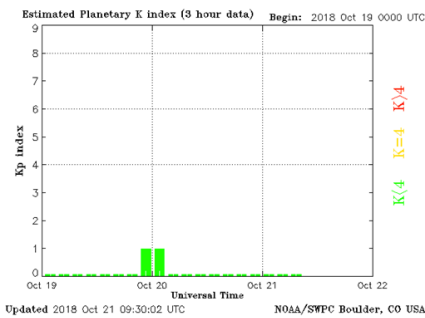
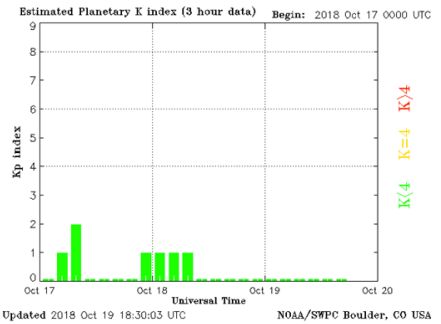


Déjà vu anyone? A northern coronal hole we've danced with before rotates into the Earth-Strike zone again! It was expected to bring a solarstorm by midday October 19th . Enhanced effects from a preceding stealthy mini-storm was possible! Expect night-side Ham Radio and GPS issues! ~ Dr. Tamitha Skov

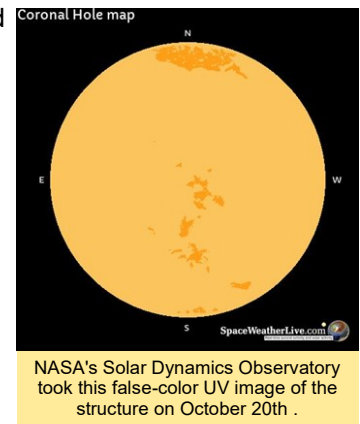
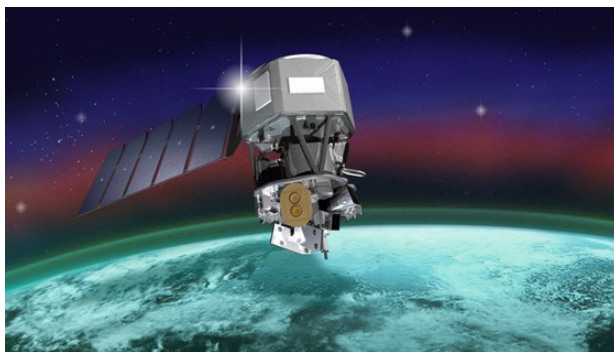
October 19th - The Sun was blank - no sunspots. Credit: SDO/HMI

Week Four

October 21st - Week starts out with no sunspots and Kp indices hovered at zero.



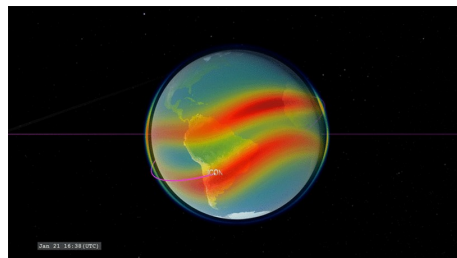
A transequatorial coronal hole was facing Earth. Enhanced solar wind was expected to arrive in ~3 days. An irregular hole in the Sun's atmosphere was turning to face Earth, spewing a ragged stream of solar wind toward our planet.



Launching of the Ionospheric Connection Explorer, or ICON, to study Earth's dynamic interface to space. Its combination of remote and in situ measurements will help scientists better understand this region — and how it changes in response to both space weather from above and terrestrial weather from below, a dynamic mix that can affect our communications (Amateur Radio), satellites and astronauts.

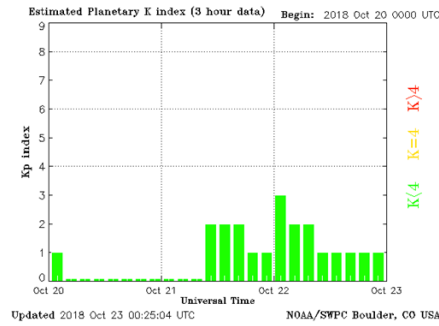
<https://www.nasa.gov/feature/goddard/2018/counting-down-to-icons-launch>

NASA's GOLD mission — short for Global-scale Observations of the Limb and Disk — launched aboard a commercial communications satellite on January 25th, 2018. From its vantage point in geostationary orbit over Brazil, GOLD gets a full-disk view of the same region of space that ICON studies, helping scientists connect the big picture with the details.





October 22nd -



October 26th - No data.

**Forecast:** Solar activity has been very low and there are no sunspots. No Earth-directed CMEs have been observed in available corona-graph imagery. Solar activity is expected to be very low October 26-28.

Monitor the aviation radiation environment: <https://www.radsonaplane.com/>

When A Solar Storm Engulfs Earth: <https://www.youtube.com/watch?v=piehWYdIOQA>

73,

Fred  
AA0JK

P.S. - "Quick, Drive!! This one's using our antenna as a coat-hanger to open the door!"



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## OCTOBER MEETING - WHAT'D I MISS?

BY BRENNAN PATE, AD0UZ

The October meeting started off the introduction of a first-time visitor. Overall there were about 36 in attendance.

Announcements were made that **THERE WILL BE NO NOVEMBER MEETING DUE TO THANKSGIVING**, nor a regular December meeting. The **DECEMBER MEETING WILL BE REPLACED BY THE CLUB DINNER PARTY ON THE 5TH**. (See the reservation form in a below page.)

Jim (K0TOR) made an announcement about the need for club members' help with a tabletop exercise that the city of Lakewood is doing on November 1st. The goal is to determine the location of safe points from where one could observe reservoir water levels and then radio in "observations" during a simulated flood event.

A request was also put out for people to sign up as tower climbers. The club needs help and other members are willing to train. If you are interested please contact W0GV, W0GN, K0HTX or WW0LF.

The main presentation was given by Bill Thomas (WT0DX), a licensee of 50 years, and he talked about FT8 and MSK144. When asked for a show of hands, it appeared that about half a dozen attendees have used JT65 or FT8 and one had used MSK144.

Bill talked about the increasing popularity of FT8 and the decreasing popularity of JT65. He explained that FT8 had been developed for weak signal communications, with a total bandwidth of about 50 MHz.

Due to the digital format it is important to have your computer properly synced to time servers so that the timing of data sent and received is correct. He recommended that a third-party time syncing software be used.

Bill gave an outline of the technical aspects, equipment and software, how to get started using it, and provided some helpful operating tricks. FT8 has a low power draw and you can use stealth antennas so it works well in covenant-controlled areas. He also talked about upcoming features and his field experiences with it.

Next, he launched into a discussion regarding MSK144 and its use with meteor scatter. He said it is used on 2 and 6 meters and that there are thousands of meteors a day off of which the radio waves can be bounced. He gave some pointers on how to operate with the mode and explained why the QSOs are short and done on USB. He also talked about available software and showed a video of a QSO.

Lastly, he took questions from the audience. If you'd like a copy of the presentation you can email Bill and he'll send you the PowerPoint.



## 285 TECHCONNECT RADIO CLUB'S (NA0TC) FALL TECHFEST

BY JED BAER, KD0YMG

The TechFest is an annual event with 5 hours of presentations on technical topics related to amateur radio, plus a "demo corner" where club members show off some of their operating technology. The TechFest will be held Saturday, November 3rd, at The Bridge Church at Bear Creek, 3101 S. Kipling St.

Please visit our website(s) for additional information:

Club website: <http://na0tc.org/>

TechFest page: <http://na0tc.org/doku.php?id=techfests>

Flyer: <http://tinyurl.com/Fall-TechFest-Flyer-2018>

## WHEN WILL HF PROPAGATION IMPROVE?

BY BILL RINKER, W6OAV

A common question heard on HF today is "When will HF propagation improve?" Well, propagation will probably continue to be marginal for quite a while. Based on present predictions, HF propagation on 30 meters and above will be marginal from now through mid 2020. See Figure 1. Yes, there will be occasional openings but one will have to be observant to catch them and usually they are short lived. Note – For information about the upcoming solar cycle 25, refer to page 11 in the March 2018 issue of the Roundtable at [https://www.w0tx.org/RoundtableArchive/2018-RoundTables/RT201803\(MAR\).pdf](https://www.w0tx.org/RoundtableArchive/2018-RoundTables/RT201803(MAR).pdf).

### References

1.) Dr. Sten Odenwald Astronomer, NASA Heliophysics Education Consortium:

[https://www.huffingtonpost.com/dr-sten-odenwald/waiting-for-the-next-suns\\_b\\_11812282.htm](https://www.huffingtonpost.com/dr-sten-odenwald/waiting-for-the-next-suns_b_11812282.htm)

2.) NASA – Long Range Forecast:

[https://science.nasa.gov/science-news/science-at-nasa/2006/10may\\_longrange/](https://science.nasa.gov/science-news/science-at-nasa/2006/10may_longrange/)

3.) W. Dean Pesnell, NASA, Goddard Space Flight Center:

[https://ccmc.gsfc.nasa.gov/RoR\\_WWW/SWREDI/2017/pesnell\\_SC\\_Pred\\_GSFC\\_SWx\\_Jun\\_2017.pdf](https://ccmc.gsfc.nasa.gov/RoR_WWW/SWREDI/2017/pesnell_SC_Pred_GSFC_SWx_Jun_2017.pdf)

4.) Newsweek Article:

<http://www.newsweek.com/solar-minimum-sun-weird-behaviour-631276>

5.) NOAA Space Weather Prediction Center:

<ftp://ftp.swpc.noaa.gov/pub/warehouse/2018/WeeklyPDF/prf2249.pdf>

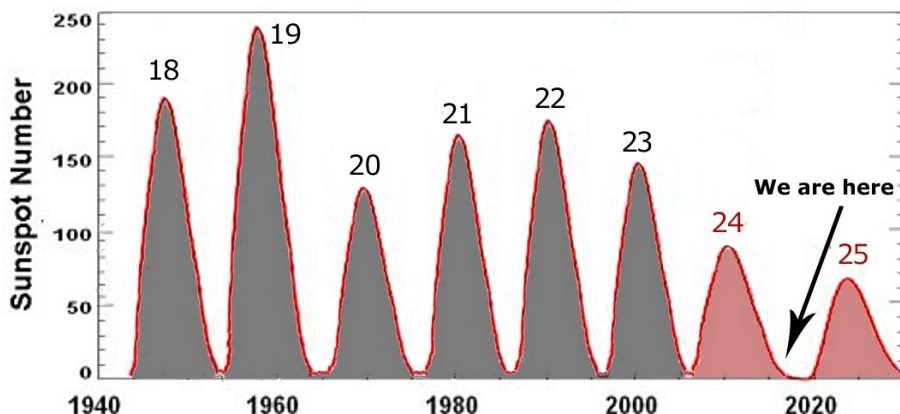


Figure 1 - Past and and future Solar Cycles

## FCC BOMBSHELL ON CHINESE HANDHELDS

By BILL RINKER, W6OAV

Dave Casler, KE0OG, has produced a very interesting YouTube video with the above title. The following is a quote from Dave's YouTube video. "The FCC has issued a Public Notice called an "FCC Enforcement Advisory," Number DA 18-980, dated 24 Sept 2018. It essentially makes worthless nearly all Chinese-made UHF/VHF ham radio handhelds imported into the country over nearly a decade that can also transmit outside the ham bands (which is nearly all of them)". Check out his video at <https://www.youtube.com/watch?v=YG8PU1eG6Cc>



## LEO WATT HONEA W5BSG - KH6MG - KL7DIF - WA3ADB - W0LAM - W0GE NBS ENGINEER-IN-CHARGE

By ROBERT BAUMANN, WV0Z, WV0Z@ARRL.NET

**Preface:** The NIST Fiscal Year 2019 Presidential Budget Summary made public in recent weeks casts doubt upon the continued operation of standard time and frequency stations WWV, WWVB and WWVH. While the future of these iconic stations is yet to be determined, here is a look back at some related history.

*An edited version of this story appeared in the October 2018 issue of Electric Radio magazine. The original text and unique, vintage images from family archives have been restored for Roundtable readers.*

### Introduction

Leo W. Honea held the title of "Engineer-In-Charge" while at various posts during his noteworthy government career including when:

- he performed ionospheric research at remote locations in the Pacific for the Central Radio Propagation Laboratory during the mid-1940s - 1950s,
- he oversaw the creation in 1947 and operation through 1959 of National Bureau of Standards standard time and frequency radio station WWVH in Kihei, Maui, Territory of Hawaii,
- he supervised the operation of NBS radio station WWV beginning in 1964 and throughout its relocation from suburban Washington D.C. to Ft. Collins, Colorado 18 months later.

Countless WWV QSL cards from the 1960s bear his signature; likely those of some who are now reading this. His photo appeared in the widely read, two-part January/February 1967 QST article by Dr. L. Yardley Beers, W0EXS entitled "WWV Moves to Colorado." Despite his significant contributions, Leo W. Honea's story has never been told.

**Early Years in Arkansas, W5BSG**

Leo Watt Honea (pronounced ho-nee) was born on May 15, 1913 in Blevins, southwest Arkansas, a rural community whose population remains in the 300s to this day. The first of four children, he became fascinated with radio at an early age. Like so many during the Golden Age of Radio and for decades thereafter, he built his own crystal set. This sparked both lifelong participation in amateur radio and a dedicated engineering career with the U.S. government.



He was the first in his family to attend college, earning his BSEE from the University of Arkansas, Fayetteville. The K6EWQ QSL card below confirms Leo's contact in 1933 with the Territory of Hawaii as a 20 year old following his junior year. Fourteen years later he would be working and raising his family in Hawaii. Upon graduation, Leo joined the U.S. Merchant Marines where he served as a ship's radio operator. Details of this service are unfortunately yet to be discovered.



**Late 1930s - Early 1940s in Concrete, Washington**

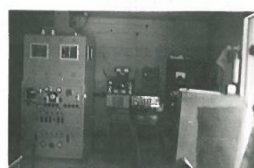
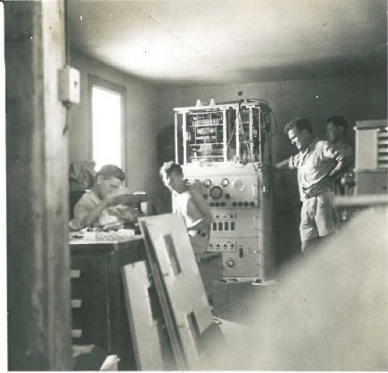
The first indication of Leo Honea's employment with the National Bureau of Standards (known since 1988 as the National Institute of Standards and Technology or "NIST") finds him in Concrete, Washington along the Skagit River in the northern Cascade Mountains performing quality assurance verification of product from local concrete plants. It is here that he met reporter Zela Marie Clinchard and on September 22, 1940 they were married in Yakima.

**1943 - 1946, Washington DC**

Leo and Zela Honea welcomed daughter Ann Marie while he was working in Washington D.C. and they were living in suburban Maryland. He was now with the Interservice Radio Propagation Laboratory (IRPL) which in 1946 became the Central Propagation Radio Laboratory (CPRL), NBS Division XIV.

**1946 - 1947 Palmyra Atoll**

On June 7, 1946 Leo Honea sailed from San Francisco on the *Matgonia* bound for Honolulu. Upon his arrival five days later, he was flown from Hickam Air Force Base 1000 miles south by military transport to Palmyra Atoll. His task was to establish an ionospheric research station for the newly formed CPRL division. His wife Zela and three year old daughter Ann would join him on October 23rd. The Honea family would not depart Palmyra until the following April.

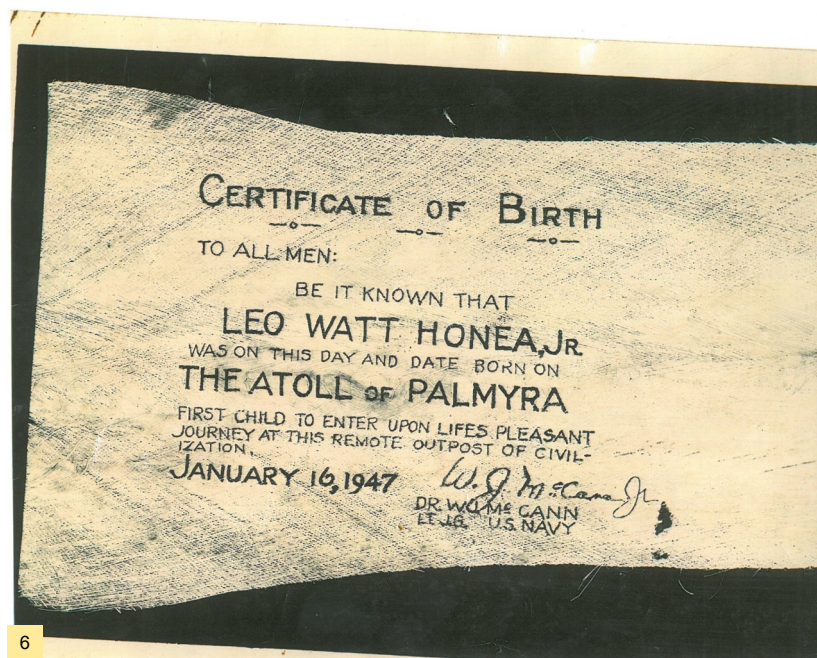


4 & 5

With advances in technology our world seems much smaller now, however 70 years ago Palmyra was considered to be among the most isolated places on the planet, sometimes referred to as "a world removed from time." The nearest continent is almost 3,400 miles away.



Palmyra is the only unorganized, incorporated territory of the United States. It measures just 2.67 square miles with a maximum elevation of only 30 feet. At one time following WWII it was briefly considered for use as a nuclear waste dump. In a positive twist of history Palmyra has become a National Wildlife Refuge and ecotourism destination. In recent times more than two dozen amateur radio DXpeditions have followed in Leo Honea’s pioneering footsteps by operating from Palmyra.



**January 16, 1947 - "Palmyra's First Citizen"**

25 year old Navy physician Dr. W. J. McCann, Jr. was awakened at 0300 local (Samoa) time. He feared a recur-

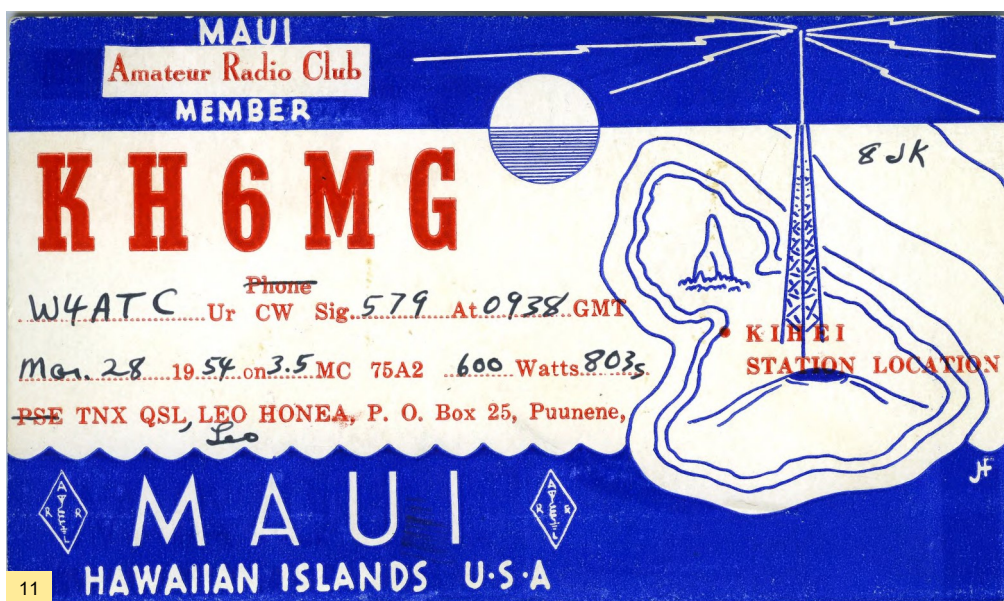
rence of the flood tide warning due to an approaching tropical storm that had prompted evacuation preparations on January 5. Instead he had been aroused by expecting father Leo Honea. 7 pound 14 ounce Leo Jr. was welcomed into this world a little over two hours later. Dr. McCann hand inked a birth certificate on palm fiber, documenting the only known birth on Palmyra. Leo Jr. immediately achieved celebrity status among the military personnel stationed there. A "Navy bassinette" was fabricated for him from an 18" x 36" x 18" packing crate.



7

**February 14, 1949, Washington DC**

Following his work on Palmyra, Leo W. Honea was among those presented a Meritorious Service Award "for service of unusual value to the department" during the very first Department of Commerce Honors Awards Program, held in the Interdepartmental Auditorium, Washington D.C.



11

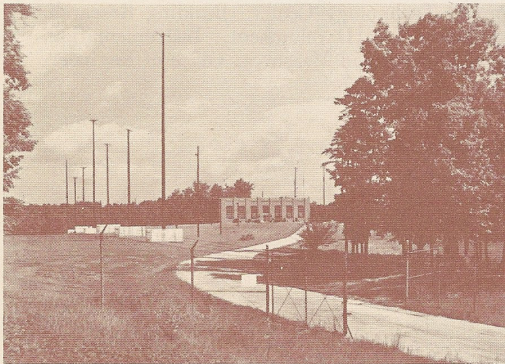
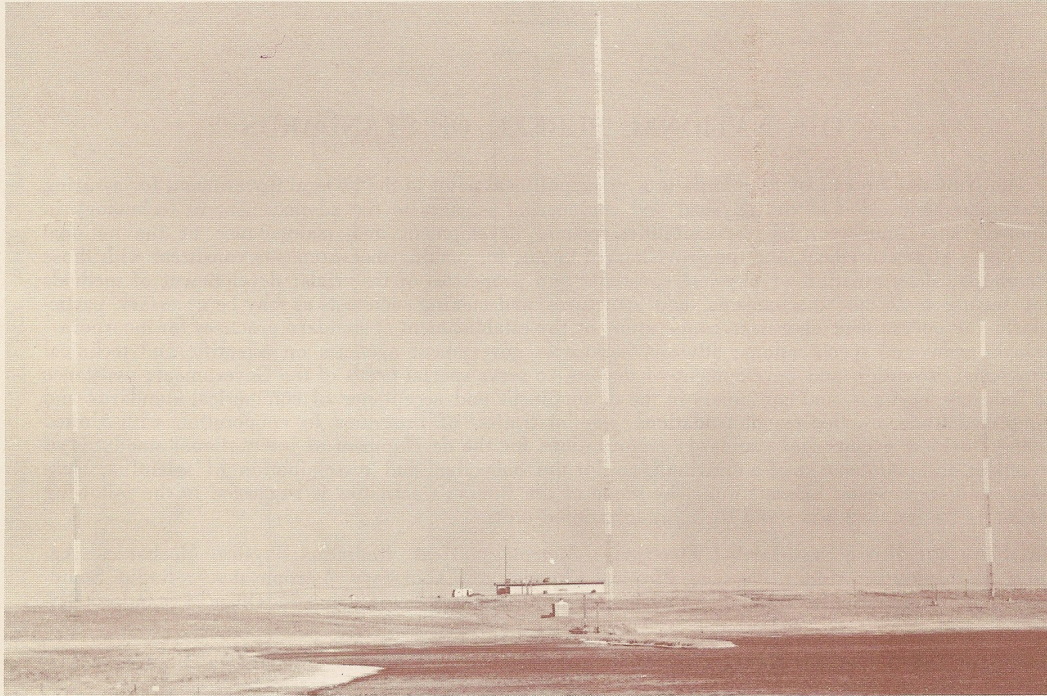
**1947 - 1959 in Maui, Territory of Hawaii, KH6MG**

Leo W. Honea next assumed charge of the CPRL ionospheric field station located in the then remote area of Kih-ei, Maui, Territory of Hawaii. The highest point on the four acre site was only ten feet in elevation. The ground floor of a modest two-story Navy building was transformed into NBS standard time and frequency radio station WWVH which began experimental broadcasting on November 22, 1948. The Honea family would make the station's upper floor their home for twelve years.



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NBS Fort Collins facility in upper photo, showing the WWVB and WWVL transmitter building in the center, new 470-foot standby antenna mast in center, and 400-foot main masts on each side which are part of the two, four-mast antenna systems, WWVL to the left and WWVB to the right. At lower left are WWV transmitter building and antennas at Greenbelt, Maryland. At lower right are antennas, transmitter building, and administrative buildings for WWVH, Maui, Hawaii.

A tsunami that resulted from the 9.0 magnitude Kamchatka earthquake on November 4, 1952 sent sea water swirling around antenna supports and three sides of the building. Due to such vulnerability, the station was eventually moved to a more protected location on Kauai in July 1971. It should be noted that Hawaii had not become the 50th state until August 21, 1959.



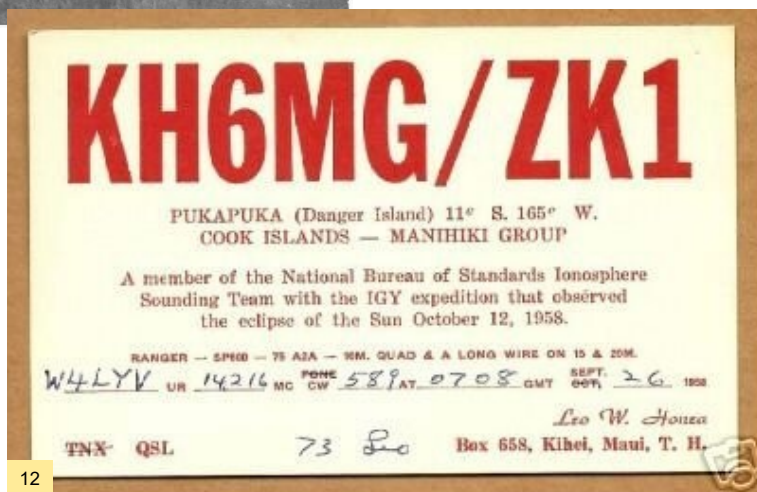
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10

**1958 Pukapuka Atoll aka "Danger Island", KH6MG/ZK1**

In the fall of 1958, Leo W. Honea and Garth H. Stonehocker formed an NBS Ionospheric Sounding Team with the International Geophysical Year Expedition on Pukapuka Atoll that observed the effects of the October 12 total solar eclipse along the geomagnetic equator. Pukapuka is a 1.9 square mile coral atoll then considered to be one of the most untouched and secluded places in the Cook Islands.



12

Three U.S. Navy torpedo squadron airmen made their way here during WWII after ditching their plane and surviving 34 days with no supplies while traveling over 1000 miles in a 4 foot by 8 foot open raft. This story was first presented in the 1942 book by Robert Trumbull entitled *The Raft* and subsequently in the 2014 survival drama film *Against the Sun*.

Leo provided rare amateur radio contact while operating as KH6MG/ZK1 and was awarded honorary membership in the Willamette Valley (Oregon) DX Club on February 10, 1959 as an expression of their appreciation.

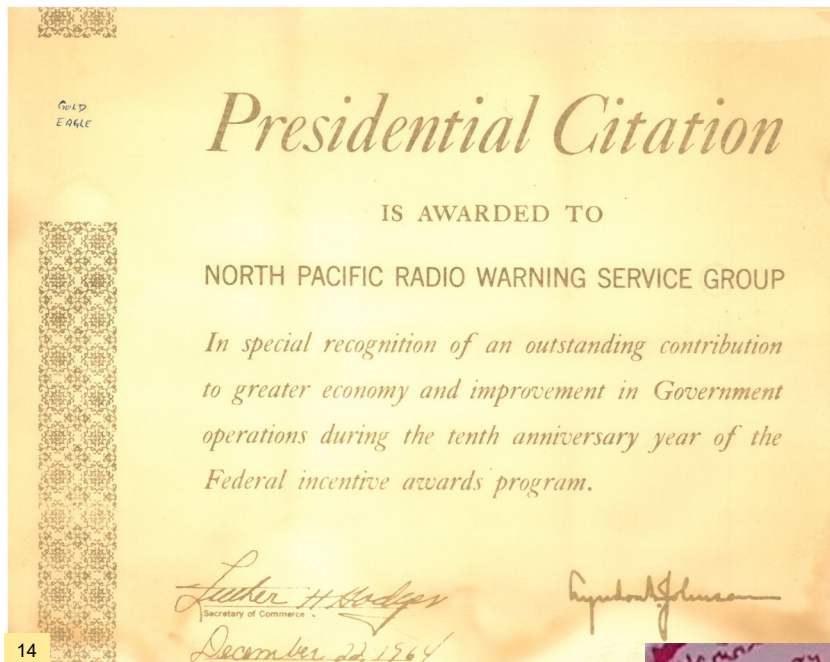
### 1959 - 1964 in Anchorage, Alaska, KL7DIF

In the fall of 1951 a CPRL radio propagation field station to become known as the North Pacific Warning Service Group was established at Elmendorf Air Force Base, Anchorage. In 1952 the station initiated a program of forecasting radio propagation conditions for Alaska and the North Pacific. Leo Honea oversaw this group's operation between 1959 and 1964, shortly after Alaska had become the 49th state on January 3, 1959.

Following the 9.2 magnitude earthquake that struck Alaska on March 27, 1964 (the strongest recorded in North America with approximately 130 fatalities), Leo spent his off duty time providing amateur radio phone patch communication which allowed area residents to advise distant family members and friends of their status.



On December 22, 1964, Secretary of Commerce Luther H. Hodges presented Leo W. Honea with a Presidential Citation bearing the signature of Lyndon B. Johnson for performing "an exceptionally meritorious special act or service in the public interest in connection with or related to his official employment." This was in recognition of his group's expeditious restoration of operation and communications following the massive quake. The Golden Eagle Presidential Seal in the upper left corner became detached and has been lost during the subsequent half-century.



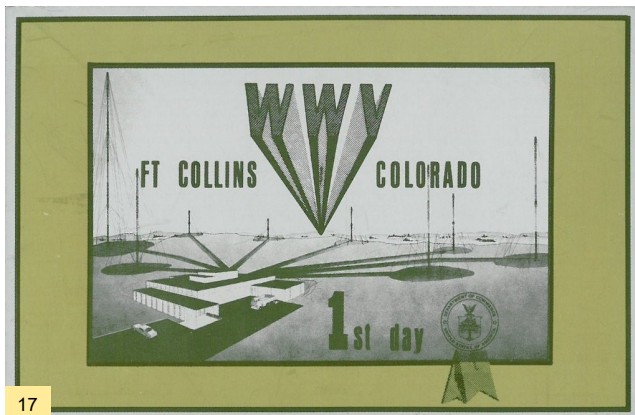
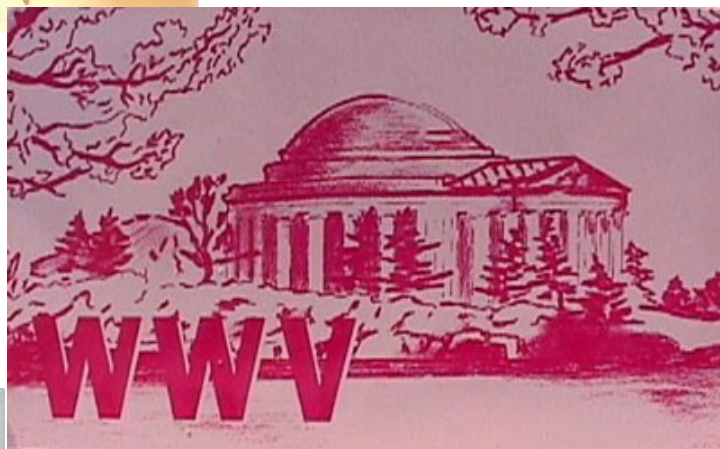
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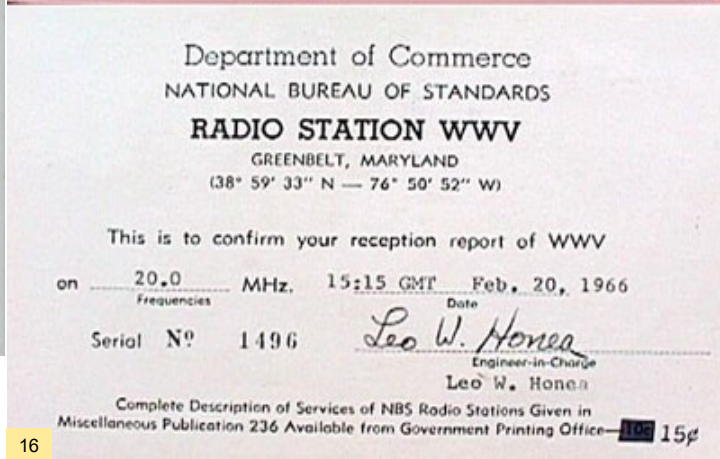
15

**1964 - 1966 in Greenbelt, Maryland, WA3ADB**

Leo W. Honea became the final Engineer-In-Charge at NBS radio station WWV while it remained in suburban Washington DC. \$970,000 had been approved (nearly 8 million in 2018 dollars) to relocate the station to the existing WWVB/WWVL broadcast site north of Ft. Collins, Colorado which had been operational since 1963.



17



16

**Department of Commerce**  
**NATIONAL BUREAU OF STANDARDS**  
**RADIO STATION WWV**  
**FORT COLLINS, COLORADO**

2.5 MHz-40°40'55"N, 105°02'31"W	15 MHz-40°40'45"N, 105°02'25"W
5 MHz-40°40'42"N, 105°02'25"W	20 MHz-40°40'53"N, 105°02'29"W
10 MHz-40°40'48"N, 105°02'25"W	25 MHz-40°40'51"N, 105°02'27"W

This is to confirm your **first day reception** report of WWV.

*Leo W. Honea*  
 Engineer-in-Charge

Complete Description of Services of NBS Radio Stations Given in  
 Miscellaneous Publication 236 Available from Government Printing Office—15c

18

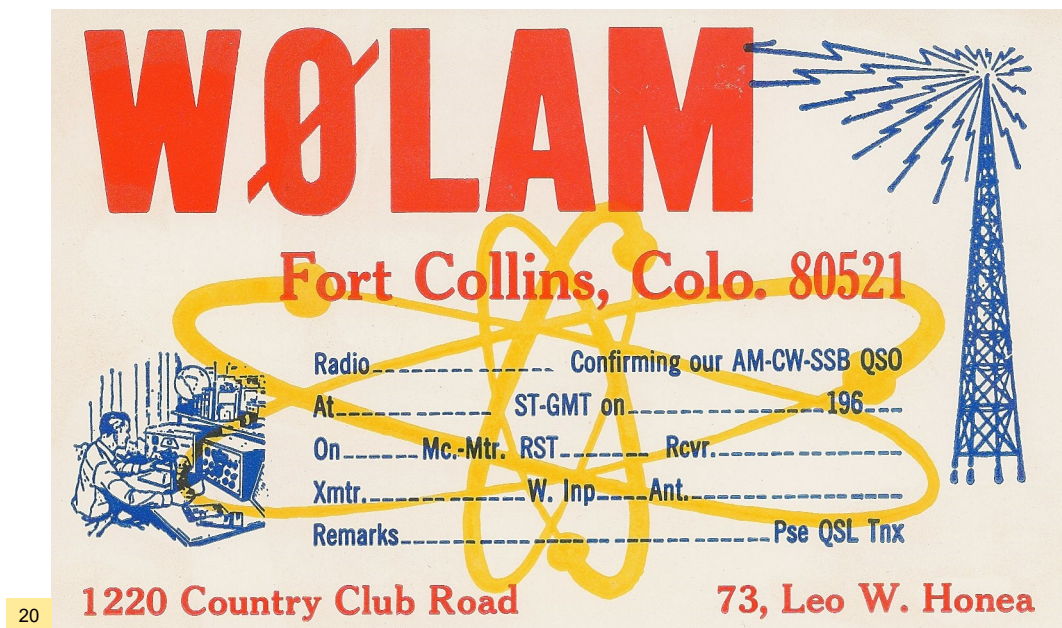
**1966 - 2000 in Ft. Collins, Colorado, W0LAM & W0GE**

Mr. Honea retained the responsibility of Engineer-In-Charge at WWV following it's relocation to Colorado where transmission began on December 1, 1966. The names of station Engineers-In-Charge were omitted from the 1968 edition of related NBS Miscellaneous Publication 236 but by 1969 it appears Leo Honea had been replaced in this capacity.



19

An ARRL Life Member, Leo continued to be active on the ham bands from Colorado, now holding the callsign W0LAM. By 1973 he had upgraded his license to Amateur Extra Class and obtained the call W0GE.



In 1974 NBS-referenced time code dissemination was initiated via two Geostationary Operational Environmental Satellites (GOES). Following his retirement, Leo remained a consultant for NASA’s Wallops Island (Virginia) Flight Facility, Mid-Atlantic Regional Spaceport supporting the launch of sounding equipment rockets (scientific instrument carrying, sub-orbital flight).

He also performed fieldwork throughout northern Colorado for the power co-op Tri-State Generation and Transmission Association, having obtained his Professional Engineer License from the State of Colorado in late 1979. His name still appeared on the membership list of the Ionosonde Network Advisory Group (INAG) published in June 1989.

Leo W. Honea became a Silent Key on February 1, 2000 at the age of 86.

**Conclusion**

Leo W. Honea was best known to family, friends, fellow engineers and researchers as well as the amateur radio community of the time in which he was long active. Yet in retrospect it is difficult to not admire the research he participated in and the remote locations where he served, the positions of high responsibility he held and his dedication to public service.

For anyone interested in the fascinating historical account of the wide range of early NBS activities, suggested reading includes: *Achievement in Radio Seventy Years of Radio Science, Technology, Standards, and Measurement at the National Bureau of Standards* by Wilbert F. Snyder and Charles L. Bragaw from October, 1986 which was consulted in the preparation of this article.

The NIST Fiscal Year 2019 Presidential Budget Summary that was recently made public lists "the shutdown of NIST radio stations in Colorado and Hawaii" as its first Illustrative Program Reduction. It seems possible, if not probable, that iconic stations WWV, WWVB and WWVH may soon be silenced.

The author wishes to express his sincere appreciation to Mr. Honea’s daughter Ann for her encouragement and material support in preparing this review of her father’s most interesting life and career. Without her assistance, no meaningful examination could have been possible. He assumes complete responsibility for any errors and omissions and welcomes correspondence from anyone who personally knew Mr. Honea.



**Maui**

Image 8:

From the 1966 edition of NBS Misc. Pub. 236 with Leo Honea's handwritten notes in margin indicating "WWVH" on lower floor and "KH6MG QTH 1947-1959" above.

Credit: Author's collection.

Image 9:

Entrance to original WWVH site taken with back towards Pacific Ocean.

Credit: Honea family photos.

Image 10:

1952 Kamchatka earthquake tsunami waters approach WWVH building and antenna supports.

Credit: Honea family photos.

Image 11:

1954 KH6MG QSL while operating from above WWVH.

Credit: Courtesy NC State University student amateur radio society records.

**Pukapuka**

Image 12:

1958 QSL documents Leo's 3rd QSO during operation from Pukapuka.

Credit: Courtesy of Robert Winn, W5KNE.

**Anchorage**

Image 13:

December 22, 1964: Secretary of Commerce Luther H. Hodges presents Leo W. Honea (r) with Presidential Citation signed by Lyndon B. Johnson.

Credit: Unknown government photographer, Honea family archives.

Image 14:

Presidential Citation received in 1964 is now missing its Golden Eagle seal.

Credit: Honea family archives.

**Greenbelt**

Image 15:

WWV Greenbelt, Maryland building: final Washington, D.C. area location before relocating to Colorado in late 1966.

Credit: Courtesy of NIST.

Image 16:

1966 WWV Greenbelt QSL signed by Engineer-In-Charge Leo W. Honea.

Credit: QSL gallery for NIST radio stations.

**Ft. Collins**

Image 17:

December 1, 1966: 1st day of WWV operation from Colorado QSL.

Credit: QSL gallery for NIST radio stations.

Image 18:

1st Day from Colorado WWV QSL signed by Engineer-In-Charge Leo W. Honea.

Credit: QSL gallery of NIST radio stations.

Image 19:

NBS staff in WWVB reception area holding a Specific Products Model 1015 solid-state WWV receiver: Leo Honea (l), Peter Vierzbicke, W0NXXB SK (r).

Credit: Courtesy of NIST.



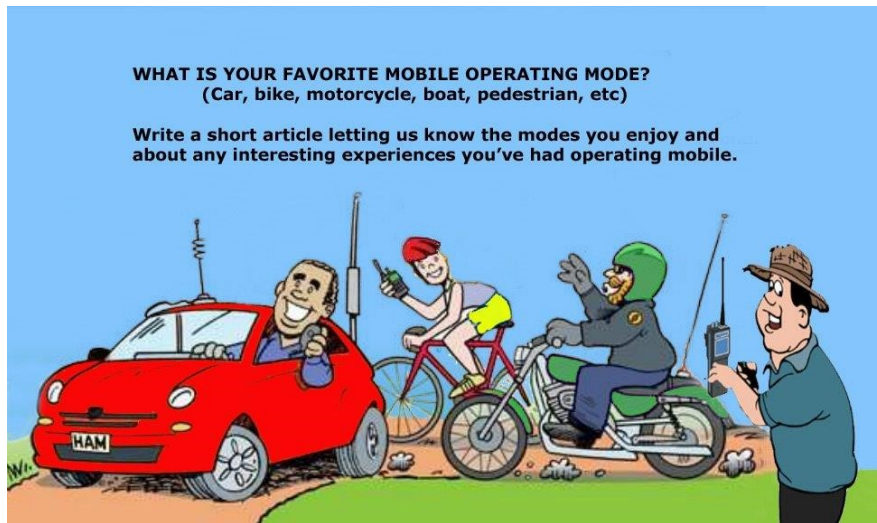
Image 20:  
Leo's late 1960s QSL bearing his initial Colorado callsign.  
Credit: Author's collection.

**Conclusion**

Image 21:  
Author's WWV QSL issued over a half-century ago. As a 13 year old SWL, I recall being very impressed that the WWV Engineer-In-Charge had actually taken time to hand sign my QSL!  
Credit: Author's collection.



WWV Fort Collins. Source: <https://www.nist.gov/image-23112>



**THE 2018 DRC Holiday Party  
is on Wednesday, December 5th, 2018.**

**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 \$18.00 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 November 28th!**

Please help us by making your reservation early. Thanks!



DENVER RADIO CLUB  
2018 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 NOV. 28TH, 2018 !  
(Please help us by making your reservation early. Thanks!)

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

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

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

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

Total # of Persons Attending at \$18.00 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:

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6511 West 74<sup>th</sup> Ave.  
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Thanks for making your reservation. We appreciate your support!

**FACT OF THE DAY**

**Sporadic-E Reflections**

The large volume of sporadic-E ionospheric communications logged by Radio Amateurs over the past many years has contributed significantly to understanding the phenomena. There is still more to learn, but many characteristics of sporadic-E communication are now well established. For example, there is a maximum useable frequency (MUF), above which signals are not returned to earth. It may seem counterintuitive at first, but the closer to that frequency one transmits without exceeding it, the further the distance their signal will return to earth via a single sporadic-E reflection. That happens, because the angle of sporadic-E reflection increases as the frequency increases. When the angle increases just to the point where a signal barely returns to earth, it returns at the greatest possible distance.

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**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**

**HAM SITE OF THE MONTH**

[NIST WWW](http://www.nist.gov)

**THE ROUNDTABLE ARCHIVE**

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

**THE ROUNDTABLE ARTICLE INDEX**

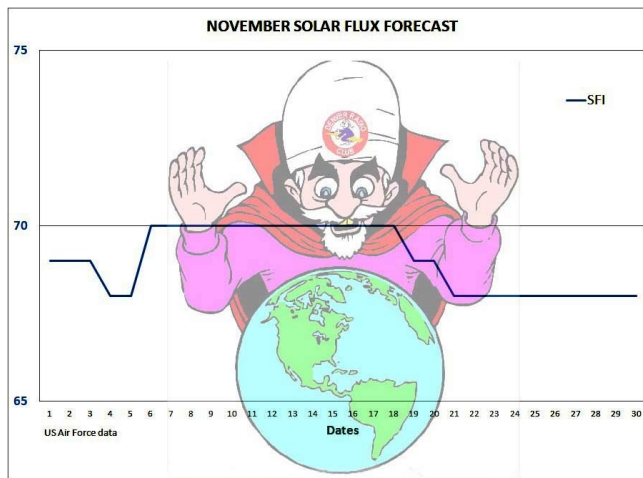
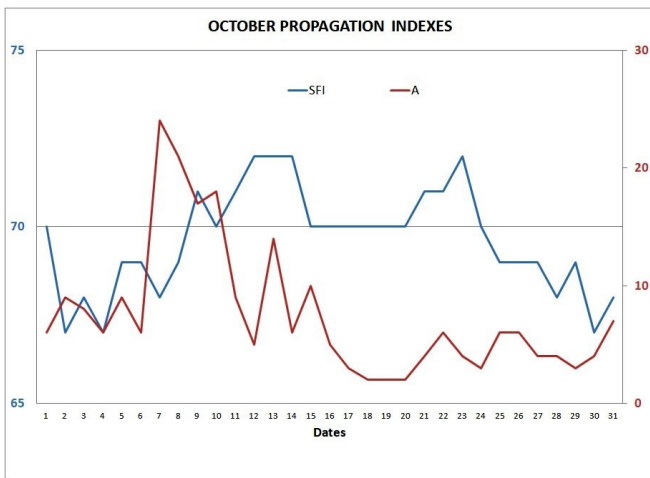
Go to: <http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf>

**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
Fall TechFest	11/03/18	Bridge Church at Bear Creek	<a href="#">285 TechConnect</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
Montana	01/26/2019	01/27/2019	<a href="#">Flathead Valley Amateur Radio Club</a>	(2018 cancelled)
Vermont	02/02/2019	02/03/2019	<a href="#">Radio Amateurs of Northern Vermont</a>	
Minnesota	02/02/2019	02/02/2019	<a href="#">Minnesota Wireless Association</a>	
British Columbia	02/02/2019	02/03/2019	<a href="#">Orca DX and Contest Club</a>	
South Carolina	02/23/2019	02/24/2019	<a href="#">Columbia Amateur Radio Club</a>	
North Carolina	02/24/2019	02/25/2019	<a href="#">Raleigh Amateur Radio Society</a>	
Oklahoma	03/09/2019	03/10/2019	<a href="#">Oklahoma DX Association</a>	
Idaho	03/09/2019	03/10/2019	<a href="#">Idaho QSO Party</a>	
Wisconsin	03/10/2019	03/11/2019	<a href="#">West Allis Radio Amateur Club</a>	
Louisiana	03/16/2019	03/17/2019	<a href="#">Louisiana Contest Club</a>	

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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	2 meter / 20 meter gateway. Useable by Technicians on 2 meters. See January 2015 RT.
2m	145.490MHz (-) 100Hz PL	Linked to the 70cm / 448.625MHz machine.
2m	147.330MHz (+) 100Hz PL	Local area. Has voting receivers. Does not TX a PL.
2m	147.330MHz (+) 131.8Hz PL	Test mode operation. Send signal reports to Tech Committee.
1.25m	224.380MHz (-) 100Hz PL	
70cm	447.825MHz (-) DCS~073; NB 12.5; +/- 2.5	Saint Anthony's. Note: This is a narrow band repeater requiring DCS.
70cm	448.625MHz (-) 100Hz PL	Linked to the 2m / 145.490MHz machine.
70cm	449.350MHz (-) 100Hz PL	Wide area coverage with Echolink, node # 4140.
70cm	449.775 MHz (-) 100Hz PL	Yaesu Fusion Digital, Wires-X and analog. 100 Hz tone required for analog.
70cm	446.7875MHz (-)	BrandMeister Repeater: Slot 1 – Wide Area Traffic, Slot 2 – Local Talk Group 310804



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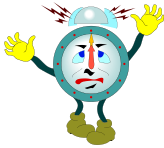


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<b>NOVEMBER 2018</b> <span style="float: right; color: red;"><i>DRC Net Sundays at 8:30 p.m. on 145.490 / 448.625 (no PL)</i></span>						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3 ARRL November Sweepstakes CW - Starts 2100 UTC
4 	5 ARRL November Sweepstakes CW - Ends 2359 UTC	6	7 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)  New Moon	8	9	10
11 	12	13	14 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	15  First Quarter	16	17 ARRL November Sweepstakes Phone - Starts 2100 UTC
18	19 ARRL November Sweepstakes Phone - Ends 2359 UTC	20	21 No DRC meeting	22 	23  Full Moon	24 EME Contest 50 - 1296 MHz - Starts 0000 UTC
25 EME Contest 50 - 1296 MHz - Ends 2359 UTC	26	27	28 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	29  Last Quarter	30 160-Meter Contest - Starts 2200 UTC Thru 12/2 @ 1600 UTC	

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Tech. Committee Chair	W6OAV	Bill Rinker	Check Roster	Check Roster
Trustee	WW0LF	Orlen Wolf	303-279-6264	<a href="mailto:owolf@mines.edu">owolf@mines.edu</a>
VE Team	KC2CAG	Tom Kocialski	720-284-1911	<a href="mailto:kc2cag@arrl.net">kc2cag@arrl.net</a>
Web Master	N0LAJ	Bill Hester	Check Roster	<a href="mailto:w0tx@w0tx.org">w0tx@w0tx.org</a>

**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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