



ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917

July 2020

PRESIDENT'S MESSAGE

BY GERRY VILLHAUER, W0GV

Hello DRC Members,

Here we are a month later and still with social distancing and face masks. It sure looks like this situation is not going away any time soon. I do believe we are generally getting smarter about all of it and learning how each of us can best cope with daily living and where it is safe to go and not safe. I have not heard of any DRC members becoming sick or infected by the virus...let's keep it that way.

As I am writing this, ARRL Field Day has just come to an end for 2020. I hope many of you took the opportunity to get on the air and make contacts. If you did, please look at the blast email that came out with instructions for giving credit to DRC. It will be interesting to see how this year's scoring compares to previous years. I got on the air much more than I thought I would and made nearly 150 contacts. I missed being with the usual DRC group but...it was still fun participating. Thanks to Doron (K1DBC) for riding herd on the progress of field day and keeping us informed of all the rule changes. Hopefully in 2021, we will be back at Chief Hosa.

After a lot of trouble shooting, it was determined that the problem with our Wires-X system on 449.775 was in the repeater itself and not field repairable. So, it was boxed up and sent to Yaesu for repair. Thanks to the great folks at Denver Water ARC for loaning us a spare repeater. This proved the problem was in our repeater and kept us on the air with full Wires-X capabilities.

We had another successful virtual meeting and program in June. Thanks to Scott Entrekin from NOAA for hosting the SKYWARN Storm Spotter Class. We had a good attendance and enjoyed a very informative program

Our July 15th program will be presented by Bill Buckwalter (W0SUN). It will be an introduction to Yaesu C4FM, System Fusion Digital Modes and WIRES-X. Here is your opportunity to learn about our newest DRC system. Bill is deeply involved in the digital radio modes and will present a lot of very useful and informative information. Mark your calendar for July 15th. An invitation for this virtual meeting will be emailed to all DRC members prior to meeting night.

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 Sinclair - KF0AGW		John Ashburn - W9JFA
Patrick McHenry - KF0AEY	John Muscatell - KJ0N	Kameel Makdisi
Bruce Wood - KF0AAY	Paul Heller - W2TTY	Steve Murray
Joshua Rubin - KF0ADC		Canaan Forslund

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

Due to our new "Stay Home - Shelter in Place" way of living the Technical Committee meetings have been temporarily cancelled. The planning stages of the projects have been completed. The execution of the projects is now on hold due to the present virus situation.

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.



June Topics:

- Video Conferencing
- Using GOOGLE Hangouts Meet: <http://meet.google.com/biz-oyhc-uwp>
- Field Day issues
- No Learning net scheduled for the 17th
- Sky Warn Spotter Training Class
- Kit projects, breadboards, soldering irons best for projects and repairs
- Solar-terrestrial charts for band conditions
- Preppers: Emergency communications. Safe guarding equipment
- ARES

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 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 the following helpful: Amateur Radio Licensing Guides via <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. 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.

73,
Fred
AA0JK

A DIFFICULT DECISION MADE DRC's 2020 HAMFEST CANCELLED

BY GERRY VILLHAUER, W0GV

The DRC Board of Directors unanimously made the decision to cancel the 2020 DRC Hamfest scheduled for Sunday August 16, 2020. We all know why this had to be done so I will not labor that point. The facts; we are way down on vendor applications and looking at the age demographic of the ham community, it is fair to say, most hams in our age group will not be willing to gather in large groups, even if more restrictions are lifted by the date of our hamfest, Organizing a successful hamfest is a big undertaking and a financial gamble for the club. With the situation we are ALL in this year, the board just does not see that happening this year. We will look forward to a bigger and better hamfest in 2021.

JUNE MEETING - WHAT'D I MISS?

BY BILL RINKER, W6OAV

Scott Entrekin, a NOAA meteorologist, gave a very interesting and informative virtual video meeting presentation on weather phenomenon for weather spotters. There were 52 attendees.

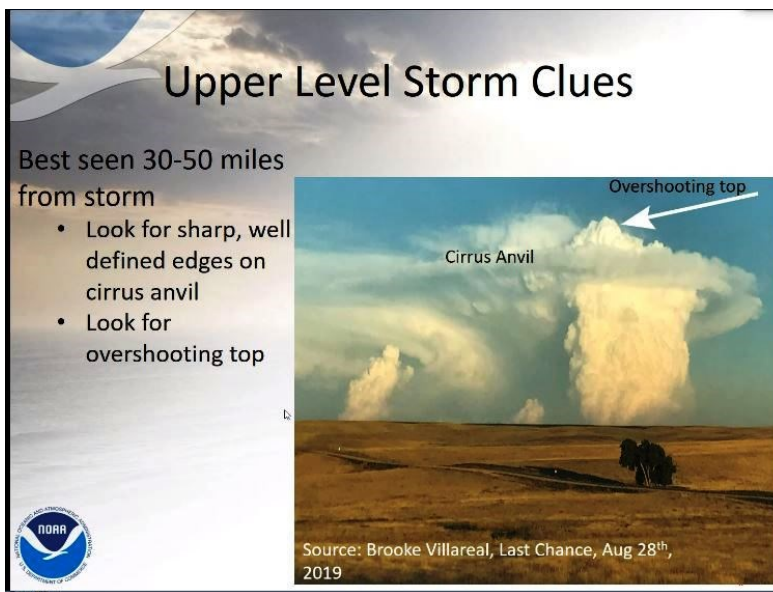
Not only did Scott discuss normal weather phenomena, he also discussed weather phenomena peculiar to the Colorado Front Range due to the mountains. For the technical inclined attendees, Scott covered how weather radar works and the various issues that can occur. Scott also described why storm spotters are very necessary even with all the available technology.

Scott covered how to accurately report various weather conditions such as hail size, flooding, rain amounts, etc.

Scott ended the presentation with a case study consisting of a storm video and associated radar presentations. The group had to decide the type of storm that was occurring. By the end of the presentation, most of the attendees appreciated how complex weather observation and reporting can be!



After the meeting terminated, attendees were able to fill out a form to obtain their weather spotter number.



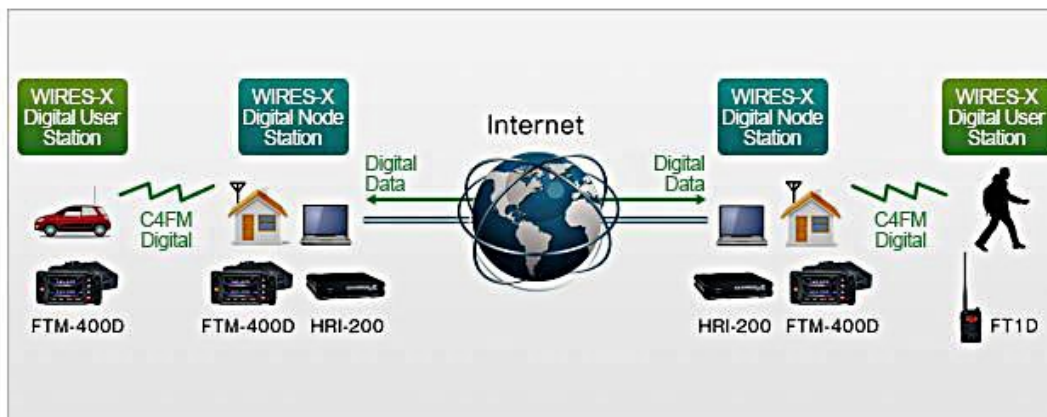
JULY MEETING ANNOUNCEMENT

BY BILL RINKER, W6OAV

The DRC WIRES-X Fusion repeater is now working well and is seeing an increase in usage. Users are making interesting worldwide contacts! To learn more about the Fusion system, plan to attend the “Google Hangouts” audio/video online meeting on July 15th. Bill Buckwalter, W0SUN, will present an introduction to Yaesu C4FM, System Fusion Digital Mode, and WIRES-X.

Speaker’s Bio:

Bill Buckwalter W0SUN was first licensed as a Novice Class Ham Radio Operator in 1978 at age 16. Bill enjoys all aspects of Ham Radio and has an Extra Class License. Bill and his wife, Merial KD0HLP, travel to Moab Utah twice a year to volunteer communications assistance for the SkinnyTire events raising money to fight cancer. Bill also participates in raising money for Colorado Children’s Hospital volunteering in the Courage Classic in Copper Mountain providing communications support. Bill has a fascination for all things digital in regards to Ham Radio with D-Star, DMR, and Fusion Radio and enjoys assisting other Ham Radio Operators in these modes.



THE W0TX WIRES-X REPEATER IS ONLINE!

BY BILL RINKER, W6OAV

Up until this month our 449.775 MHz repeater was only a local C4FM repeater with no access to the worldwide Yaesu Wires-X network. This was because of the lack of reliable Internet service to the repeater site.

This month, Gerry - W0GV, Dave - WG0N, and Mark - N0XRX, worked to establish reliable Internet service to the repeater site. However, they were not able to configure the repeater and the Wires-X unit to link up to the Yaesu Wires-X network. With additional help from Marshall - KF0UV, they began troubleshooting software and hardware. Extensive testing revealed that the repeater itself was defective. The Denver Water Amateur Radio Club graciously loaned the DRC a C4FM repeater which allowed the DRC system to link to the Yaesu Wires-X network. The DRC repeater was sent to Yaesu for repair.

The repeater has been working well with users making worldwide contacts. A special thanks to the folks mentioned above who donated their time and talents to the project.

Complete information about the Yaesu Wires-X system can be found at: [https://www.hamoperator.com/Hamoperator/WiRES-X Bible/Entries/2016/7/25 WiRES-X Bible Updated.html](https://www.hamoperator.com/Hamoperator/WiRES-X%20Bible/Entries/2016/7/25%20WiRES-X%20Bible%20Updated.html)

HISTORY OF THE CAR RADIO

BY DENNIS, N8UDL

SUBMITTED BY BILL RINKER, W6OAV

FROM THE MASSILLON AMATEUR RADIO CLUB'S FEEDBACK

Sometimes it is fun to find out how some of the many things that we take for granted actually came into being! It all started with a woman. Seems like cars have always had radios, but they didn't. Here's the true story:

SUNSET

One evening, in 1929, two young men named William Lear and Elmer Wavering drove their girlfriends to a lookout point high above the Mississippi River town of Quincy, Illinois to watch the sunset. It was romantic night to be sure, but one of the women observed that it would be even nicer if they could listen to music in the car.

Lear and Wavering liked the idea. Both men had tinkered with radios (Lear had served as a radio operator in the U.S. Navy during World War I) and it wasn't long before they were taking apart a home radio and trying to get it to work in a car. But it wasn't as easy as it sounds: automobiles have ignition switches, generators, spark plugs, and other electrical equipment that generate noisy static interference, making it nearly impossible to listen to the radio when the engine was running.

SIGNING ON

One by one, Lear and Wavering identified and eliminated each source of electrical interference. When they finally got their radio to work, they took it to a radio convention in Chicago. There they met Paul Galvin, owner of Galvin Manufacturing Corporation. He made a product called a "battery eliminator" a device that allowed battery-powered radios to run on household AC current. But as more homes were wired for electricity, more radio manufacturers made AC-powered radios. Galvin needed a new product to manufacture. When he met Lear and Wavering at the radio convention, he found it. He believed that mass-produced, affordable car radios had the potential to become a huge business.

Lear and Wavering set up shop in Galvin's factory, and when they perfected their first radio, they installed it in his Studebaker. Then Galvin went to a local banker to apply for a loan. Thinking it might sweeten the deal, he had his men install a radio in the banker's Packard. Good idea, but it didn't work. Half an hour after the installation, the banker's Packard caught on fire. (They didn't get the loan.) Galvin didn't give up. He drove his Studebaker nearly 800 miles to Atlantic City to show off the radio at the 1930 Radio Manufacturers Association convention. Too broke to afford a booth, he parked the car outside the convention hall and cranked up the radio so that passing conventioners could hear it. That idea worked. He got enough orders to put the radio into production.

WHAT'S IN A NAME

That first production model was called the 5T71. Galvin decided he needed to come up with something a little catchier. In those days many companies in the phonograph and radio businesses used the suffix "ola" for their names. Radiola, Columbiola, and Victrola were three of the biggest. Galvin decided to do the same thing, and since his radio was intended for use in a motor vehicle, he decided to call it the Motorola.

But even with the name change, the radio still had problems: When Motorola went on sale in 1930, it cost about \$110 uninstalled, at a time when you could buy a brand-new car for \$650, and the country was sliding into the Great Depression. (By that measure, a radio for a new car would cost about \$3,000 today.) In 1930 it took two men several days to put in a car radio. The dashboard had to be taken apart so that the receiver and a single speaker could be installed, and the ceiling had to be cut open to install the antenna. These early radios ran on their own batteries, not on the car battery, so holes had to be cut into the floorboard to accommodate them. The installation manual had eight complete diagrams and 28 pages of instructions.

HIT THE ROAD

Selling complicated car radios that cost 20 percent of the price of a brand-new car wouldn't have been easy in the best of times, let alone during the Great Depression. Galvin lost money in 1930 and struggled for a couple of years after that. But things picked up in 1933 when Ford began offering Motorola's pre-installed at the factory. In 1934 they got another boost when Galvin struck a deal with B.F. Goodrich Tire Company to sell and install them in its chain of tire stores. By then the price of the radio, installation included, had dropped to \$55. The Motorola car radio was off and running. (The name of the company would be officially changed from Galvin Manufacturing to "Motorola" in 1947.) In the meantime, Galvin continued to develop new uses for car radios. In 1936, the same year that it introduced push-button tuning; it also introduced the Motorola Police Cruiser, a standard car radio that was factory preset to a single frequency to pick up police broadcasts. In 1940 he developed with the first hand held two-way radio: The Handie Talkie for the U. S. Army. A lot of the communications technologies that we take for granted today were born in Motorola labs in the years that followed World War II. In 1947 they came out with the first television to sell under \$200. In 1956 the company introduced to the world the world's first pager; in 1969 it supplied the radio and television equipment that was used to televise Neil Armstrong's first steps on the Moon. In 1973 it invented the world's first hand held cellular phone. Today Motorola is one of the largest cell phone manufacturers in the world. And it all started with the car radio.

WHATEVER HAPPENED TO

The two men who installed the first radio in Paul Galvin's car, Elmer Wavering and William Lear, ended up taking very different paths in life. Wavering stayed with Motorola. In the 1950's he helped change the automobile experience again when he developed the first automotive alternator, replacing inefficient and unreliable generators. The invention lead to such luxuries as power windows, power seats, and, eventually, air-conditioning.

Lear also continued inventing. He holds more than 150 patents. Remember eight-track tape players? Lear invented that. But what he's really famous for are his contributions to the field of aviation. He invented radio direction finders for planes, aided in the invention of the autopilot, designed the first fully automatic aircraft landing system, and in 1963 introduced his most famous invention of all, the Lear Jet, the world's first mass-produced, affordable business jet. (Not bad for a guy who dropped out of school after the eighth grade.)



SOLAR GEOPHYSICAL ACTIVITY REPORT

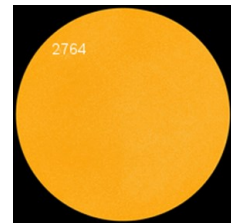
PROVIDED BY FRED HART, AA0JK



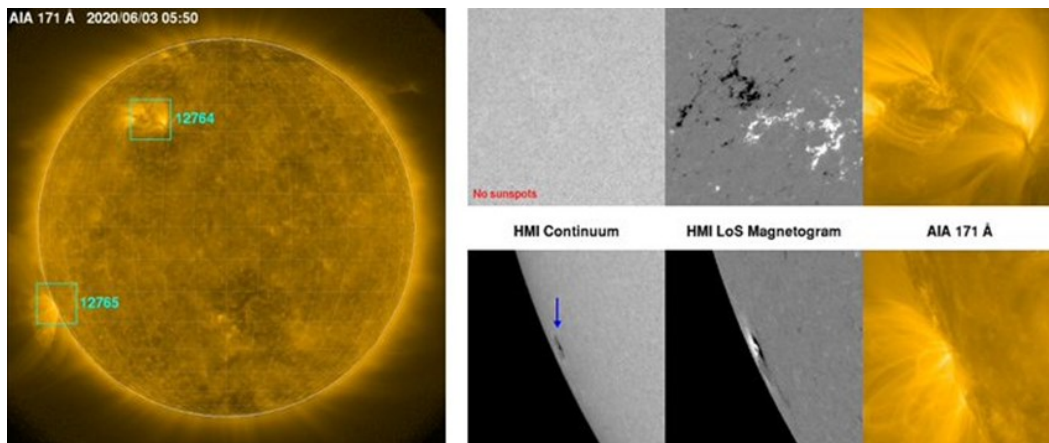
June 1st - Return to quiet. A new-cycle sunspot that unleashed a flurry of solar flares on May 29th had disintegrated so quickly that it didn't even have time to be officially numbered. Solar Minimum was back. But the episode showed that it might not last much longer.

Spotless Days were 30 days and counting.

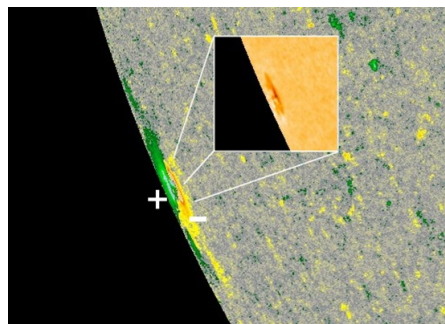
June 2nd - Sunspot AR2764, breaks 30 day stretch of spotlessness (image to right).



June 3rd - Another new (solar cycle 25) region rotated onto the visible side. Unlike AR2764, which produced an M-class flare, this region (to be named AR2765) had a big sunspot. It was also responsible for several eruptions, CMEs, over the previous few days.



Another solar cycle 25 sunspot. A new sunspot was emerging over the Sun's southeastern limb. Provisionally numbered AR2765, it is inset in this magnetic map of the Sun's surface from NASA's Solar Dynamics Observatory.



AR2765 was a member of new Solar Cycle 25. We know this because of its magnetic polarity. According to Hale's Law, sunspots switch polarities from one solar cycle to the next. Southern sunspots from old Solar Cycle 24 have a +/- polarity. This sunspot was the opposite: +/-, marking it as a member of Solar Cycle 25.

On June 1st, before this sunspot rotated into view, it produced a long-duration B-class solar flare. This suggested that AR2765 was capable of explosive activity. Geoeffective flares were possible as the southern hemisphere sunspot rotated toward Earth.

This sunspot's primary dark core was almost twice as wide as Earth, and it was followed by a frothy wake of magnetic turbulence stretching 70,000 miles behind the sunspot.

AR2765 was crackling with minor solar flares. NASA's Solar Dynamics Observatory recorded B3-class eruptions on June 5th.

The explosion hurled a cloud of plasma into space, but not toward Earth. Further geoeffective explosions were possible as the sunspot turned toward Earth.

B-class solar flares are considered to be relatively minor. But consider this, A typical B-class solar flare releases as much energy as 100 million WWII atomic bombs. Only on the Sun, which is itself a 1027 ton self-contained nuclear explosion, would such a blast be considered "minor."

Six Meters Recently Running Hot: <http://www.arrl.org/news/six-meters-recently-running-hot>

The Six meter band came into its own in May and has been open in some direction from almost every location in the US almost every day. Sporadic E peaks around the summer solstice, on or around June 21st, with a minor peak around the winter solstice, on or around December 21st.

June 6th - Region AR2765 continued to turn more directly into view on Friday. Within several hours, additional spots had started to emerge, and depending on further development, would help the chances for at least minor C-Class solar flares. At the time, the Solar X-Rays remained stable.

Week Two:

June 8th - The solar wind arrived. A stream of solar wind brushed Earth's magnetic field. The gaseous material was flowing from a northern hole in the Sun's atmosphere.

June 10th - An explosion on the Sun. A dark magnetic filament bisecting sunspot AR2765 erupted on June 9th at 1800 UT. NOAA analysts were examining the event to see if it had hurled any material toward Earth. First looks suggest not.

Signs of life from the Sun. For the past few years, we've paid special attention to days without sunspots. But what about days with sunspots? Suddenly, it makes sense to talk about this again because the Sun is showing signs of life. This month we've had a sunspot almost every day, 11 out of 12 days so far. New Solar Cycle 25 is gaining strength, and it could bring an end to Solar Minimum during 2020.

Week Three:

Two active solar cycle 25 regions rotated into Earth view, AR2764 and AR2765. AR2765 fired off two M-class flares that boosted solar flux levels into the low 70's. This provided some decent radio propagation over the following few days.

Solar sector boundary crossing. Earth was about to cross a fold in the heliospheric current sheet, a vast wavy structure in interplanetary space separating regions of opposite magnetic polarity. The crossing, called a "solar sector boundary crossing," was expected on June 16th, and was looking to trigger minor geomagnetic activity around Earth's poles.

Solar Orbiter spacecraft makes its first flyby of the Sun June 15th.

Solar Orbiter, a joint mission by NASA and the European Space Agency, has hit its first big milestone of its sun-watching mission.

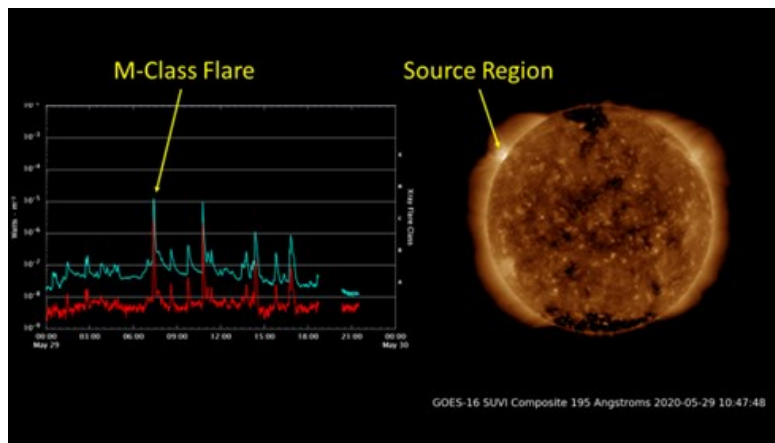
The probe is designed to give scientists a view of our Sun unlike any they've ever seen before. It's trajectory will allow it to study the solar activity at the poles of the Sun.

This first flyby of the Sun, or perihelion, brought the probe to a distance of half the distance between the Earth and Sun, 48million miles.



<https://www.space.com/solar-orbiter-first-sun-flyby.html?>

Solar Cycle 25 is showing signs of life. In the past month it has produced the strongest solar flare in years, (M1-class), and a sunspot that lasted for two whole weeks, (AR2765). The strongest solar flares since 2017.



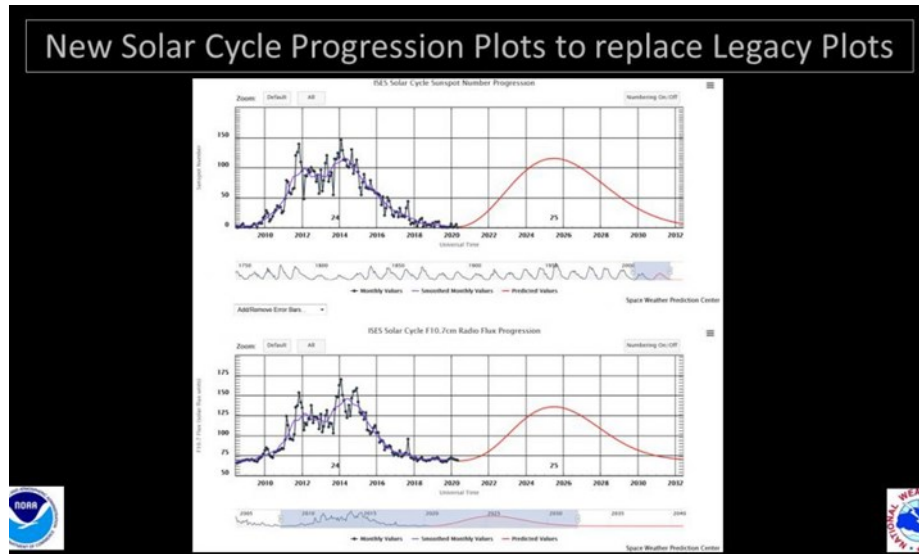
GOES-16 SUVI Composite 195 Angstroms (above image).

Going Into Week Four:

Week four started out mostly quiet, except on the North East limb, filaments were lifting others collapsing. We will be watching for other activity as the week progresses.
Kp index was calm to quiet.

Coronal holes were confined to the polar regions.

NEW SOLAR CYCLE



PROGRESSION PLOTS TO REPLACE LEGACY PLOTS. (Above Image)
 These new plots are interactive, and allow for much easier examination of data

Solar-Terrestrial Data - http://www.n0nbh.com			
21 Jun 2020 2234 GMT	VHF Conditions	HF Conditions	Condition
SFI 67 SN 0	Item Status	Band Day Night	K-In A-In
A 5 K 1/PIntry	Aurora Band Closed	80n-40n Fair Good	Quiet 0-2 0-7
X-Ray n/a	6n EsEU 50MHz ES	30n-20n Poor Poor	Unsettled 3 8-15
304A 92.1 @ SEM	4n EsEU Band Closed	17n-15n Poor Poor	Active 4 16-29
Ptn Flx No Rpt	2n EsEU Band Closed	12n-10n Poor Poor	Minor storm 5 30-49
Elc Flx No Rpt	2n EsNA Band Closed	Geomag Field VR QUIET	Major storm 6 50-99
Aurora /n=	EME Deg Fair	Sig Noise Lvl S0-S1	Severe storm 7-9 >100
Aur Lat No Report	MUF	MUF US Boulder NoRpt	SFI A-In K-In Prop Opng
Bz -4.2 SW 291.0	MS	Solar Flare Prb 1%	>180 <8 <3 E-W open
	0 MIN 6 12 18 UTC MAX	(C) Paul L Herrman 2013	>180 <8 >3 N-S open
			>250 >30 >3 Aurora

Above image: Propagation Information – For current information see the W0TX web page.

Forecast:
 Prepared jointly by the U.S. Dept. of Commerce, NOAA,
 Space Weather Prediction Center
 UPDATED 2020 June 21 0030 UTC

24 hr Summary:
 Solar activity was very low. The solar disk was spotless. No
 Earth-directed CMEs were observed in available satellite imagery.

Forecast:
 Solar activity was expected to be very low on 21-23 June.

73,

Fred
 AA0JK

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
[Arrow Antenna J-Poles](#)

THE ROUNDTABLE ARCHIVE

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

THE ROUNDTABLE ARTICLE INDEX

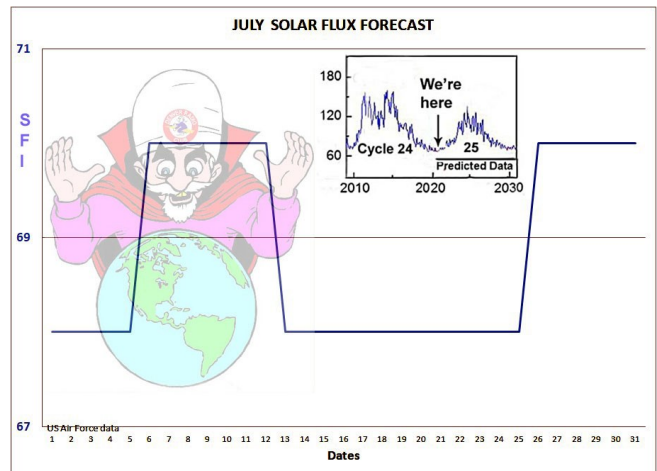
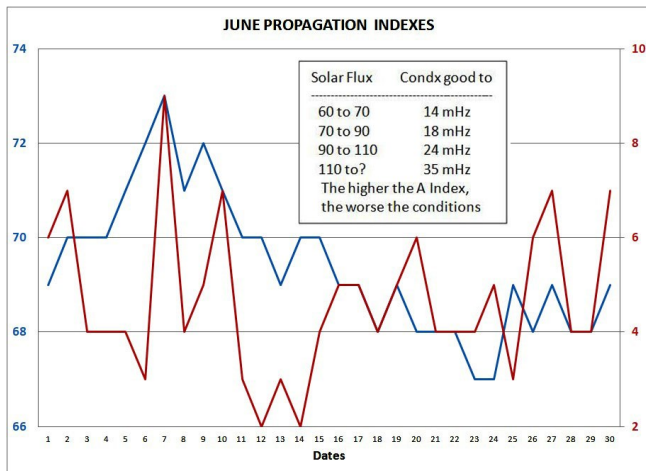
Go to: <http://www.w0tx.org/RoundtableArchive/-RoundTables-Index.pdf>

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
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All cancelled.

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
Maryland-DC	08/08/2020	08/09/2020	Anne Arundel Radio Club	
Hawaii	08/22/2020	08/24/2020	Hawaii QSO Party	
Ohio	08/22/2020	08/23/2020	Ohio QSO Party	
Kansas	08/29/2020	08/30/2020	Kansas QSO Party	
Colorado	09/05/2020	09/06/2020	Pikes Peak Radio Amateur Association	
Tennessee	09/06/2020	09/07/2020	Tennessee QSO Party	
Alabama	09/12/2020	09/13/2020	Alabama QSO Party	
Texas	09/12/2020	09/13/2020	Texas QSO Party	
Iowa	09/19/2020	09/20/2020	Story County ARC	
New Jersey	09/19/2020	09/20/2020	New Jersey QSO Party	
Washington	09/19/2020	09/20/2020	Western Washington DX Club	
Maine	09/26/2020	09/27/2020	Wireless Society of Southern Maine	
California	10/03/2020	10/04/2020	California QSO Party	
Nevada	10/09/2020	10/11/2020	Sierra Nevada Amateur Radio Society	

ATTENTION

SUPPORT THE DRC FROM YOUR AMAZON PURCHASES

You can now support your Denver Radio Club when you make purchases from Amazon.com. Amazon Smile donates 0.5% of your purchase to the non-profit (501.c.3) organization of your choice. This is at no additional cost to you. To support the DRC just visit smileamazon.com. Select Denver Radio Club, Inc. as the organization you want to support and proceed with your order as usual. Amazon Smile will credit the DRC automatically. Thank you for your support.

DRC REPEATERS

BAND	Freq / Shift / PL Tone	Additional Information
6m	53.090MHz (-1MHz) 107.2Hz PL	
Packet	145.05MHz<>14.105MHz	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



HAM RADIO OUTLET
WORLDWIDE DISTRIBUTION

HRO 12 STORE BUYING POWER WORKS FOR YOU!!






www.hamradio.com

8400 E. Iliff Ave #9, Denver, CO 80231

303-745-7373 800-444-9476

24 HOUR FAX 303-745-7394

e-mail: denver@hamradio.com

JULY 2020							<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 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	2	3	4   Full Moon	
5	6	7	8 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	9	10	11 IARU HF World Championship - Starts 1200 UTC	
12 IARU HF World Championship - Ends 1159 UTC  Last Quarter	13	14	15 DRC Online Meeting Elmer 6 p.m. Meeting 7 p.m.	16	17	18	
19	20  New Moon	21	22 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	23	24	25	
26	27  First Quarter	28	29 Learning Net 7:30 p.m. 145.490 / 448.625 (No PL)	30	31		

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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.

Subject: I'm located in...

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