THE ROUND TABLE

Monthly Newsletter Of The Denver Radio Club

Since 1917 October 2022

President's Message

By Gerry Villhauer, W0GV

Hello DRC Members,

It is feeling like fall already, time to get those antenna projects done before the snow comes. I have two of them on my to-do list. Cathy and I just returned from a trip to Europe, mostly Germany. We had a great time, saw lots of history and enjoyed Oktoberfest in Munich Germany. The worst part was dealing with the Munich airport. That is a place to avoid if you can. Thanks to all who responded to our recent SurveyMonkey. It appears the majority of you responding are in favor of holding face to face meetings again. We will be working on details and hopefully, be able to do that starting in 2023. Also, we got a positive response to hold a Holiday/Christmas party in December. Again, we will see if we can make that happen this year.

I obviously missed the last meeting and elections. I want to congratulate Doron, K1DBC, as our newly elected board member. Doron has been a big contributor to our club, especially with the changes we have made with automation improvements. Again Congratulations Doron. Thanks to our other three board members, Orlen, WW0LF, Jeff, KB0CHT and Dave, WG0N for their re-election and continued service to the board.

I can't adequately express our thanks to Jim Beall, K0TOR for his many, many years of service to our board of directors and many of those years as our Treasurer. Jim is a very meticulous person and does a superb job with anything he does. I hope Jim will continue to spearhead our siren tests and net control duties. From me, our Board of Directors; and our club members. THANK YOU Jim!

Thanks to Larry Irons, K0LAI, for his presentation on the experiences with the recent Golden Gran Fondo bicycle event. This is one of the largest bicycle events in the area, and, as Larry explained, Ham Radio is vital to the operational safety of this very large event.

Our next regular meeting will be Wednesday, October 19th. Please put it on your calendar. Our program for the meeting is TBD. We will put the program information on the DRC Website and announce it on the Sunday net.

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

73 for now,

Gerry
W0GV
President

Who's New In The DRC?

From Cathy Villhauer, N0CRZ, DRC Membership

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

Gabriel Campbell - KE6BAL
Dominique Ingoglia - KFØITR
Thomas Tully - KFØKEP
Charles Bradley - KD2GMH

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

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

Learning Net Report

By Fred Hart, AA0JK

Purpose:

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

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

Topics of interest we encourage:

Personal Communications
-Getting started in the various modes, of communications.

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

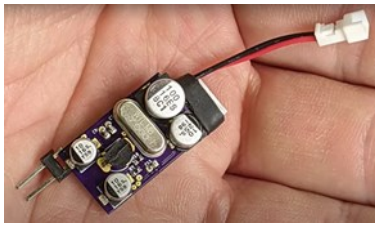
Radio electronics, and technology
- Kit building, understanding signal propagation. and building antennas.

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

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

August topics we discussed:
- Near Vertical incidence Skywave Propagation NVIS Antennas
https://youtu.be/fvZ7z-6wAy0

- KB9VBR NVIS Antennas: https://www.youtube.com/watch?v=QevfTRHKdYg
- Local Emergency Communications with NVIS - Let's Build an 80m/40m Dipole
  https://youtu.be/yYXVKtu3nwk
- Morse Telegraph Key | Development History: https://youtu.be/OyLpleqfyJ4
- 3D Printed Radio | No Batteries: https://youtu.be/KGhe3OrNIII
- Simple Construction of Wire Antennas – Practical Antennas
- Fantastic Fox Finder from KIØHG
- Hidden Transmitter Hunting (Fox Hunting) | Ham Radio Answers (dcasler.com)
- (1) Ham Radio Fox Hunting 101 – YouTube
- Fox Hunting, Direction Finding KB9VBR: https://youtu.be/yR2cpd0vQdM
- SOTA Smallest (ever?) HF transceiver? K6ARK: https://youtu.be/6rKpxAWZ7uM



- 40M transceiver, 2.7 g of radio and 850mW of output power.

Great topics from our group. We certainly enjoy everyone's participation. Thanks to all.

If you are listening and don't yet have your license, you can contact us at the W0TX web-site, w0tx@w0tx.org, or elmer@w0tx.org.

If we don't have the answer here on the net, we have a lot of experienced Hams in the club that can help.

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

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

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

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

arrl.org/public-service

Use your communication skills to help keep your community safe!

weather.gov/marine/ham
warrenares.org/home/skywarn-weather-spotting
SKYWARN Spotter Training Updates: weather.gov/bou/spot_training

During severe weather events, amateur radio operators bring significant resources to storm spotting, including an established communications system that can function in an emergency. They provide real-time information to partners like emergency management and forecasters at the national weather service. The data received from hams helps issue weather watches, warnings, and advisories.

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

73,
Fred
AA0JK
elmer@w0tx.org

Don't Get "Juice Jacked"!

By Bill Rinker, W6OAV

Traveling hams are known for heavy Smartphone battery drain when using such ham apps as Echolink, APRS.fi, Smart SDR, iCluster, etc. Fortunately, these days there are public USB charging stations available in airports, airplanes, hotels, car rentals, cruise ships, etc. However, they can be very dangerous for travelers to use! Cyber-criminals can modify those public USB charging stations causing them to install malware on a Smartphone (or on an iPad) and to download the entire Smartphone's personal data (passwords, contact info, pictures, emails, etc) from the Smartphone without the traveler's knowledge (known as **Juice Jacking**). So, how can a traveler safely charge a Smartphone using a public USB charging station? By using a "Data Blocker" which plugs in between the USB charging port and the USB charging cable. See Figure 1 (next page). The Data Blocker physically blocks data transfer and syncing.

The Data Blockers are available from Amazon and eBay for less than $10. Check out Amazon at the URL below. Also this URL has a good video on Juice Jacking:
https://www.amazon.com/PortaPow-3rd-Data-Blocker-Pack/dp/B00T0DW3F8/ref=asc_df_B00T0DW3F8/?tag=hyprod-20&linkCode=df0&hvadid=309773039951&hvpos=&hvnetw=g&hvrand=6703662500399060970&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=9028751&hvtargid=pla-490993755272&psc=1

Several good "ways to avoid Juice Jacking" videos are available at:
https://www.youtube.com/watch?v=l5Jyb1a-JZk
https://www.youtube.com/watch?v=3fTAw2uN-yw

A good written explanation of Juice Jacking and how to avoid it is available at:
https://www.comparitech.com/blog/information-security/juice-jacking/

Hopefully, this article will help you better understand and avoid the risks of Juice Jacking.

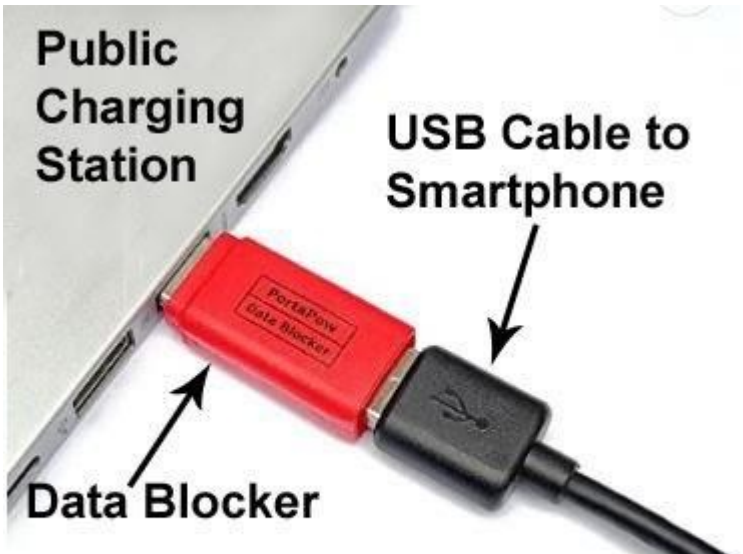


Figure 1 - The Data Blocker

Tour de Cure Ham Operations

By Kevin Schmidt, K0KPS

Annually, the American Diabetes Association (ADA) conducts several charitable bicycle rides in different areas around the country. Riders solicit donations for their rides which can be short 10 mile events for families, 30 mile rides, or metric century rides (100 km or 60 miles) in length. Riders choose their particular course, usually based upon their fitness levels. The courses in the Denver area all started and finished near Littleton Adventist Hospital.

The ten mile course predominantly followed a neighborhood route utilizing the Highline Canal. Both the 30 and 60 miles courses initially routed from Littleton out to the Ken Caryl area, west of the hogback into Deer Creek Canyon and out towards Chatfield Reservoir. At that point the 30-milers headed towards Highlands Ranch while the 60-milers travelled south to Waterton Canyon, east on Titan Road and entered Chatfield Reservoir from the south before heading around the lake and then towards Highlands Ranch before ending at the starting point.

The ADA approached the Denver Radio Club (DRC) in late August soliciting radio operators to support the ride with individuals staffing a Command Center, five rest stops, and some staffing SAG (support and gear) vehicles to assist riders with maintenance needs or conveyance back to the start area.

To support such a ride, propagation from existing local repeaters needed assessment to determine coverage of the entire course. It was determined that some areas west of the hogback and in the Deer Creek Canyon area would be problematic and have dead coverage areas, and thus unsuitable. A portable repeater could be set up on Chief Mountain near Tiny Town and south of the Mt Lindo Cross. A

Yagi antenna pointing to the east, sharing another repeater in the area with a different PL (CTCSS) would ideally work. Thanks to the work of Gerry, WØGV and Dave, WGØN the system would provide good coverage. In addition, a communication plan was developed to provide redundancy in case the primary repeater had issues. It is always prudent to have a Plan-B and C just in case.

The ADA had a virtual meeting with many participants of both the DRC and the ADA to answer questions and to spell out expectations. The routes were detailed; the five rest stops requiring staffing were located, as well as other concerns.

On a Sunday night net, a call went out seeking volunteer support to staff multiple positions. Several hams answered the call.

The ADA trained net control on the software that riders utilized to report any maintenance conditions, medical situations, or other information via cell phone application back to command.

Several emails with updated information went out to the volunteer radio operators. After assignments had been made, an ICS-204 Assignment form went out to expose the DRC members to normally utilized paperwork by Incident Command. An ICS (Incident Command System) Communication Plan ICS-205 was also created so that each operator could pre-program their radios to access repeaters and alternate communications at each radio site. For those of you that are ICS purists, the forms couldn't totally be accurately completed according to ICS standards as the ADA employed a corporate aligned structure rather than the ICS structure.

On game day, the weather was less than optional with cooler temperatures in the mid-40s and light rain/drizzle. For a rider, the temperatures were better for riding rather than the high 90s seen on previous days. For communicators, it was time to break out the foul weather gear (or should I say "fowl" weather?) to stay warm and dry. Of course the SAG radio operators stayed dry and warm. All they had to do was place their magnetic mount antennas on their vehicle and run coax through the door and await assignment while riding around.

Net Control in Command Tent – L to R
Jim KØTOR, Daniel W1WIN and Gerry WØGV

Rest Stop 1

Tactical radio signs were utilized as to assigned locations. Tactical signs are used to refer to a particular site rather than an individual operator, such as “Rest Area-1” since individuals could reassigned to a different site or be exchanged during the incident. After radio traffic was aired to Net Control, the operator needed to sign off with their FCC call sign to remain legal. Net control maintained an electronic log of all radio traffic during the event with transmission times recorded.

After the last riders, or the “turtles”, reached respective rest areas and the sweeper verified that no riders remained on the course behind the sweeper, Net Control communicated the ability for each Rest Area to close down and pack up equipment. Hams could then report to the finish line for a complementary lunch and refreshments or return to their QTHs.

Overall, the event went extremely well. Everyone seemed to enjoy participating in the event and would look forward to volunteering next year.

I would like to acknowledge and thank the following volunteers for participating in this event:

Dave Baysinger, WGØN	Jim Beall, KØTOR
Alan Bieber, KIØEP	Doron Chiam, K1DBC
Mark Ehr, KØEHR	Daniel Leach, KI4WIN
Tom Martin, WØTRM	Brad Nelson, KDØGBX
Dick Nelson, N6WHV	Cody Neyrinck, WTØR
Sarah Nyxx, N4NYX	Kevin Schmidt, KØKPS
Mark Thomas, NØXRX	Gerry Villhauer, WØGV

My apologies if I missed listing anyone who assisted and I missed your name.

Below, I have included the ICS-204 Assignment List and the ICS-205 Communication Plan which was utilized for the event.

If you are interested in EmComm activities, most organizations require that participants take at a minimum two Incident Command System classes that explain how all response agencies structure and scale their organizations. The two entry classes are IS-100.C An Introduction to ICS and IS-700.B which provides an understanding of the National Incident Management System (NIMS), both of which can be taken online at FEMAs website at https://training.fema.gov/. Both can easily be completed in one afternoon.

ASSIGNMENT LIST (ICS 204)

1. Incident Name:	2. Operational Period:		3.
American Diabetes Association Tour de Cure	Date From: 10 Sept 2022 Time From: 0600	Date To: 10 Sept 2022 Time To: 1800	**Branch:** **Division:** **Group:** Communications **Staging Area:** 700 W Mineral Ave

4. Operations Personnel: Name — Contact Number(s)

Operations Section Chief: _____

Branch Director: _____

Division/Group Supervisor: _____

5. Resources Assigned:

Resource Identifier	Leader	# of Persons	Contact (e.g., phone, pager, radio frequency, etc.)	Reporting Location, Special Equipment and Supplies, Remarks, Notes, Information
Command / Net Control	Daniel Leach - KI4WIN	1	(940) ###-#### - 448.975 100	700 W Mineral Ave at 06:00
Command / Net Control VH	Jim Beall - KØTOR	1	(303) ###-#### - 448.975 100	700 W MIneral Ave at 06:00
DRC Tech Operations	Gerry Villhauer - WØGV	1	(303) ###-#### - 448.975 100	700 W MIneral Ave at 06:00
DRC Comm Coordinator	Dave Baysinger - WGØN	1	(303) ###-#### - 448.975 100	700 W MIneral Ave at 06:00
SAG Vehicle #1	Brad Nelson - KDØGBX	1	(720) ###-#### - 448.975 100	700 W Mineral Ave at 06:00
Motocycle Rover	Mark Thomas - NØXRX	1	(720) ###-#### - 448.975 100	700 W Mineral Ave at 06:00
	Brittany Burcham - ADA	1	(773) ###-####	700 W Mineral Ave

6. Work Assignments:

Command - (1) Communicates with Rest Stop crews and reports to ADA (Amer Diabetes Assoc) staff leader(s)
(2) Receives calls from riders requiring SAG and coordinates SAG effort. (3) Maintains log (ICS-214) of event progress.

SAGs - (1) Roaming patrol, looking for situations requiring assistance (2) Lead out each route unless by M/C. (3) Sweep route for last rider and notify Rest Stop(s) of last rider

7. Special Instructions:

Use Tactical call signs (Command, Rest Area #, SAG #, etc). End transmission with FCC Call sign or every 10 mins.
Once checked in, monitor radio continously. Notify Command of last rider and whether you can close station.
Only relay bib numbers. Don't use rider names over air!
If there is an "Incident" involving rider, obtain all bib numbers and relay to Command ASAP.
If radio communications fail, use alternate sites according to ICS-205 or use cellular.
Be aware - Primary Freq shares freq with backup repater and differt CTCSS.

8. Communications (radio and/or phone contact numbers needed for this assignment):

Name/Function	Primary Contact: indicate cell, pager, or radio (frequency/system/channel)
Command Repeater /	Daniel Leach - 448.975MHz 100Hz or (940) ###-####
Command Rptr Backup /	448.975 MHz 123 Hz - Blue Mtn Site
Backup Repeater /	449.350 MHz 100 Hz Squaw Mtn Site
Talk Around Simplex /	446.300 MHz Simplex

9. Prepared by: Name: _____ Position/Title: _____ Signature: _____

ICS 204 | **IAP Page** 1 of 2 | Date/Time: 06 Sept 2022

ASSIGNMENT LIST (ICS 204)

1. Incident Name:	2. Operational Period:		3.
American Diabetes Association Tour de Cure	Date From: 10 Sept 2022	Date To: 10 Sept 2022	**Branch:**
	Time From: 0600	Time To: 1800	**Division:**
			Group: Communications
			Staging Area: 700 W Mineral Ave

4. Operations Personnel: Name / Contact Number(s)

Operations Section Chief: _____

Branch Director: _____

Division/Group Supervisor: _____

5. Resources Assigned:

Resource Identifier	Leader	# of Persons	Contact (e.g., phone, pager, radio frequency, etc.)	Reporting Location, Special Equipment and Supplies, Remarks, Notes, Information
Rest Area #1	Kevin Schmidt - KØKPS	1	(303) ###-#### - 448.975 100	7227 W Chatfield St - Chatfield HS
Rest Area #1	Sarah Nyxx - N4NYX	1	(719) ###-#### - 448.975 100	7227 W Chatfield St - Chatfield HS
Rest Area #2	Alan Bieber - KIØEP	1	(303) ###-#### - 448.975 100	9880 W Deer Creek Canyon - Hilde
Rest Area #2	Mark Ehr - KØEHR	1	(303) ###-#### - 448.975 100	9880 W Deer Creek Canyon - Hilde
Rest Area #3	Doron Chiam - K1DBC	1	(720) ###-#### - 448.975 100	7811 W Titan Rd - Happy Dog
Rest Area #3				7811 W Titan Rd - Happy Dog
Rest Area #4	Cody Neyrinck - WTØR	1	(703) ###-#### - 448.975 100	8773 S Ridgeline Blvd - STEM Scho
Rest Area #4				8773 S Ridgeline Blvd - STEM Scho
Rest Area #5	Tom Martin - WØTRM	1	(720) ###-#### - 448.975 100	1991 W Wildcat Resv Blvd - Thunde
Rest Area #5				1991 W Wildcat Resv Blvd - Thunde

6. Work Assignments:

Command - (1) Communicates with Rest Stop crews and reports to ADA (Amer Diabetes Assoc) staff leader(s)
(2) Receives calls from riders requiring SAG and coordinates SAG effort. (3) Maintains log (ICS-214) of event progress.

SAGs - (1) Roaming patrol, looking for situations requiring assistance (2) Lead out each route unless by M/C. (3) Sweep route for last rider and notify Rest Stop(s) of last rider

Rest Area - (1) Report to assigned Rest Area and notify Rest Stop Captain of your arrival. (2) Report to Command via radio and confirm Rest Area is staffed and setup by volunteers. (3) Report first and last rider(s) (4) Report any rider incidents ASAP by bib numbers. (5) Report any supply needs relayed by Rest Stop Captain.

7. Special Instructions:

Use Tactical call signs (Command, Rest Area #, SAG #, etc). End transmission with FCC Call sign or every 10 mins.
Once checked in, monitor radio continously. Notify Command of last rider and whether you can close station.
Only relay bib numbers. Don't use rider names over air!
If there is an "Incident" involving rider, obtain all bib numbers and relay to Command ASAP.
If radio communications fail, use alternate sites according to ICS-205 or use cellular.
Be aware - Primary Freq shares freq with backup repater and differt CTCSS. ***Maintain Safety! Stay hydrated and nourished. Use sunscreen***

8. Communications (radio and/or phone contact numbers needed for this assignment):

Name/Function	Primary Contact: indicate cell, pager, or radio (frequency/system/channel)
Command Repeater /	Daniel Leach - 448.975MHz 100Hz or (940) ###-####
Command Rptr Backup /	448.975 MHz 123 Hz - Blue Mtn Site
Backup Repeater /	449.350 MHz 100 Hz Squaw Mtn Site
Talk Around Simplex /	446.300 MHz Simplex

9. Prepared by: Name: _____ Position/Title: _____ Signature: _____

ICS 204 | **IAP Page** 2 of 2 | Date/Time: 06 Sept 2022

INCIDENT RADIO COMMUNICATIONS PLAN
FORM ICS-205

1. INCIDENT NAME	2. DATE/TIME PREPARED	3. OPERATIONAL PERIOD DATE/TIME
American Diabetes Association **Tour de Cure**	**03 Sept 2022 1300**	**10 September 2022 – 0600** **10 September 2022 - 1800**

4. BASIC RADIO CHANNEL UTILIZATION

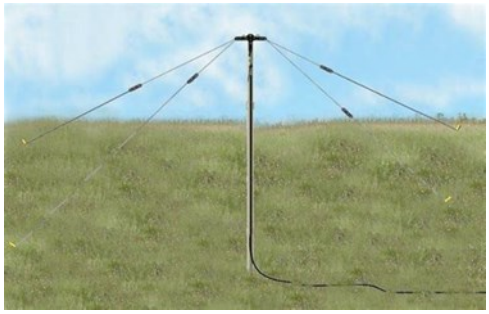
Ch #	Channel Name	Assignment	RX Frequency Narrowband (N) Wideband (W)		RX Tone/NAC	TX Frequency Narrowband (N) Wideband (W)		TX Tone/NAC	Mode Digital (D) Analog (A) Mixed (M)	Remarks
1	COMMAND	CMD	448.975	W	100 Hz	443.975	W	100 Hz or None	A	Portable Repeater Command to Rest Areas & SAGs
2	COMMAND Backup	CMD	448.975	W	123 Hz	443.975	W	123 Hz or None	A	Backup Repeater – Secondary (Blue Mtn Site)
3	Backup	CMD	449.350	W	100 Hz	444.350	W	100 Hz	A	Backup –Repeater – Long Range Talk-in (Squaw Mtn Site)
4	Talk Around	Tactical	446.300	W	None	446.300	W	None	A	Simplex
5										
6	VHF Backup		147.330	W	100	147.930	W	100	A	Backup VHF Repeater (Green Mtn WMFR Sta-04)
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										

5. Prepared By **Dave Baysinger**

ICS-205 Tour de Cure 2022-09-02 Page 1 of 1 Created 2-Sep-2022

Near Vertical Incidence Skywave Propagation - NVIS Antennas

By Fred Hart, AA0JK



Why would you want an NVIS antenna?
Loss of power grid. Loss of repeaters, cellphones, internet. The NVIS antenna and your battery powered HF radio can provide needed communications.

A NVIS antenna is very portable. A good choice for SOTA, POTA. Camping. It makes a great emergency HF antenna or simply an antenna you can take with you for field operations.

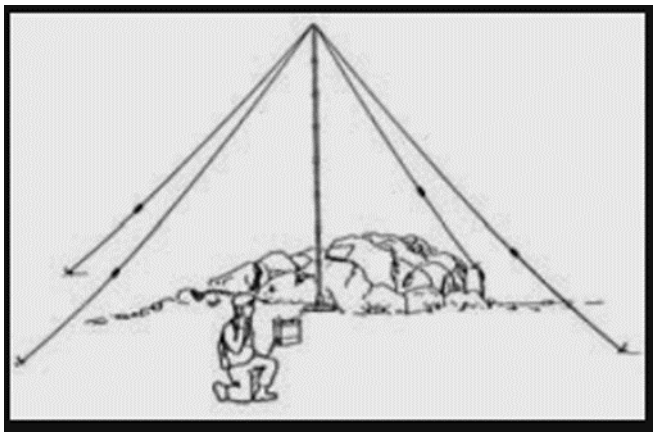
It can be easily set up by one person and does not require trees or extensive supports. It can be setup almost anywhere on the ground that is level.

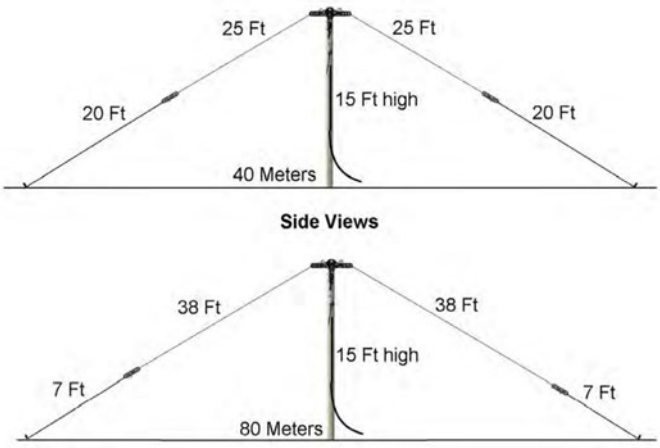
It allows you to make reliable contacts from 30 to 400 miles away.

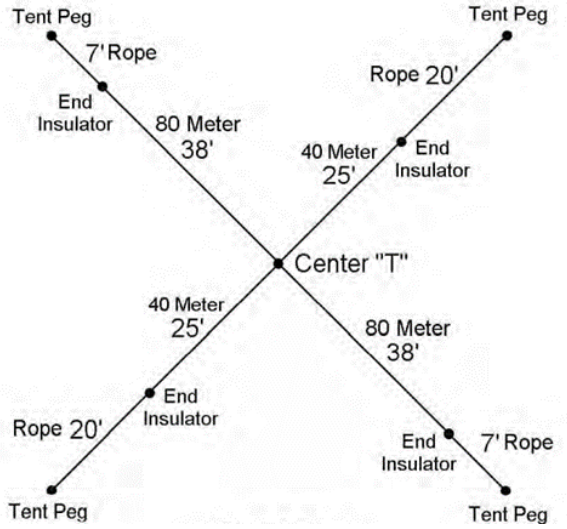
Due to its proximity to the ground, reception is fairly quiet and free of noise (QRN & QRM).

Note: It is not a good DX antenna. This antenna system is developed for reliable communication within 400 miles with 100 watts or less power.

Easy to fabricate your own. The MacGyver method. Make it for ~$15. https://youtu.be/yYXVKtu3nwk
Mast and feed-line not included.

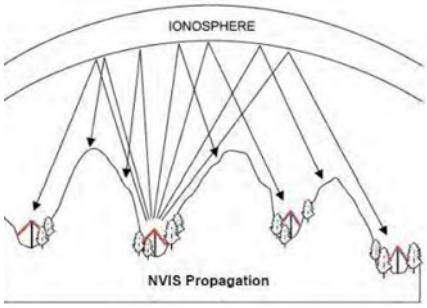






What is NVIS?

Near Vertical Incidence Skywave (NVIS) is a propagation mode which uses high angle radiation to send signals almost straight up to be reflected back to Earth for very effective short to medium distance communications. This mode of operation makes it ideal for in-state communications during disasters or other emergency situations. The military has used NVIS techniques for decades to provide short haul communication with other units on the ground.



NVIS only works at frequencies from 2 MHz to 10 MHz. The signal must penetrate the D layer of the ionosphere, and bounce off the F layer. Lower-frequency signals will not penetrate the D layer; higher frequencies will not bounce off the F layer at these sharp angles and just goes out into space. Remember the Maximum Useable Frequency (MUF? For amateur radio operators, we're looking at 40 and 80 meters primarily for NVIS use.

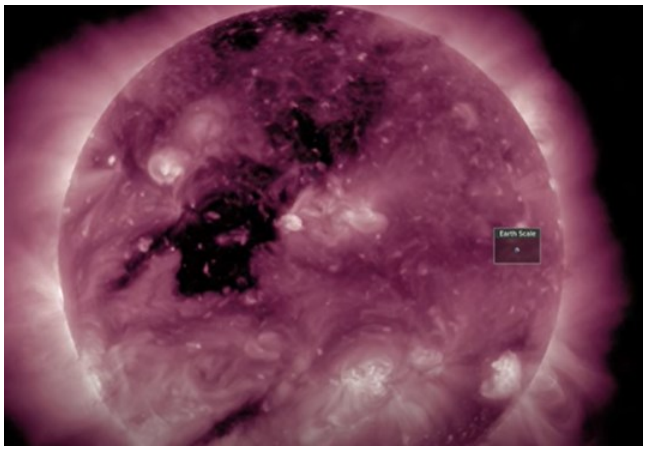
The higher the angle, the lower the frequency needed to work properly. Therefore lower amateur radio frequencies such as 40 and 80 meters are ideal for NVIS use. NVIS generally requires takeoff angles of 70 degrees or higher. Radio waves directed vertically at frequencies higher than the critical frequency pass through the ionized layer out into space.

The NVIS antenna. Great to have in your go-bag for outdoor outings, or if the communications infrastructure goes down.

73,
AAØJK
Fred

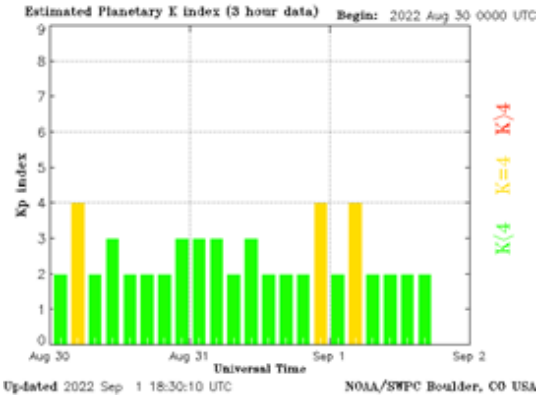
Solar Geophysical Activity Report

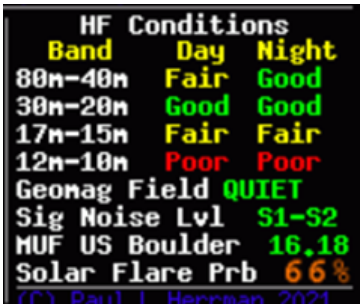
Provided By Fred Hart, AA0JK



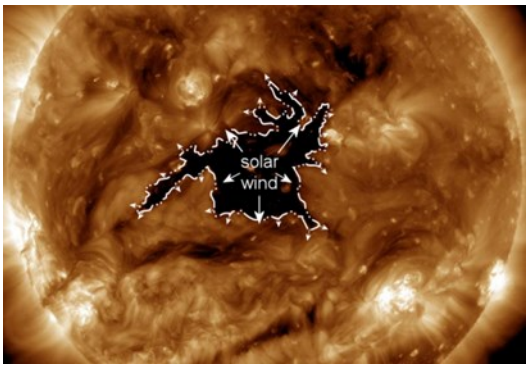
September 1st

The suns active regions were crackling, but the overall solar flaring was on the decline. After the southern region departed, the solar wind showed slight variability due to the southern coronal hole that was wrapped around a sunspot group departed. The next coronal hole was directly earth-facing, and was expected to provide much stronger solar wind with a high likelihood of low-level geomagnetic storms. A chance of stronger storm conditions were expected to follow.





Above Left Image: SFI 113 Kp 2

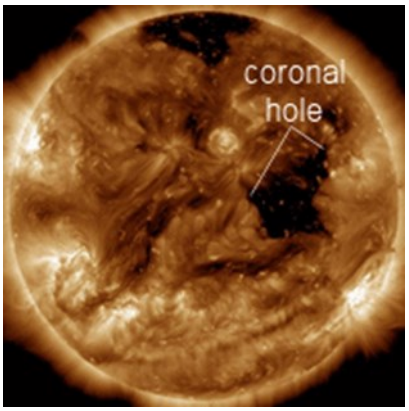


Above Image: An ultraviolet image of the sun taken by NASA's Solar Dynamics Observatory

A "coronal hole," an area where the sun's magnetic field opens up and allows solar wind to escape from the sun's corona. It looks dark because glowing-hot plasma that should be there is gone.

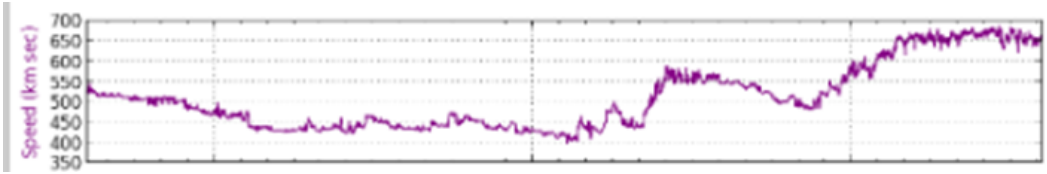
September 4th - A stream of solar wind hit Earth on September 4th, sparking a G2-class geomagnetic storm.

The solar wind causing this storm was flowing from a large hole in the sun's atmosphere. The hole was so large, earth was expected to be inside its exhaust for 24-36 hours.

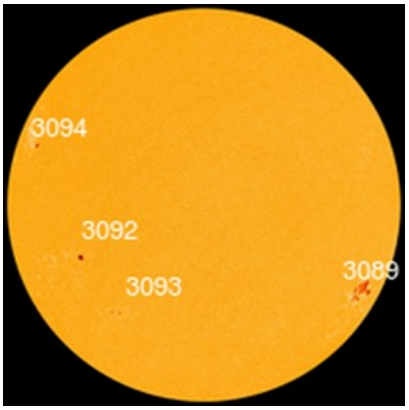


Above Image Credit: SDO/AIA

Earth was inside a stream of solar wind flowing from this coronal hole.



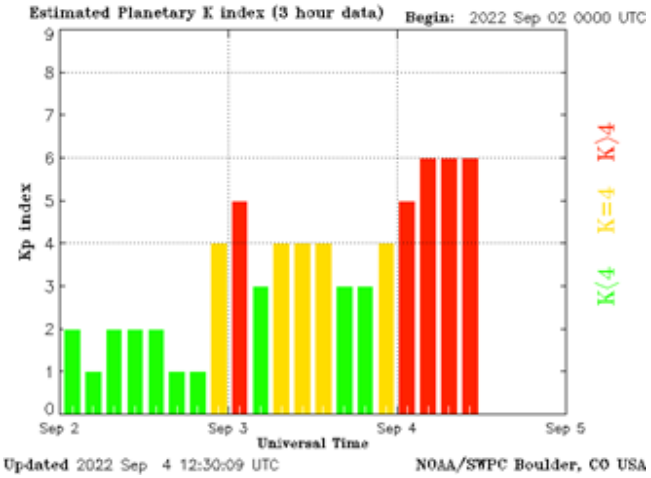
Sharp increase in solar wind speed

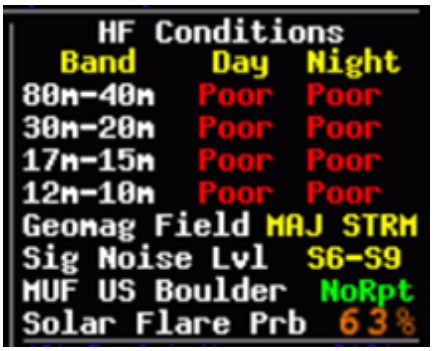


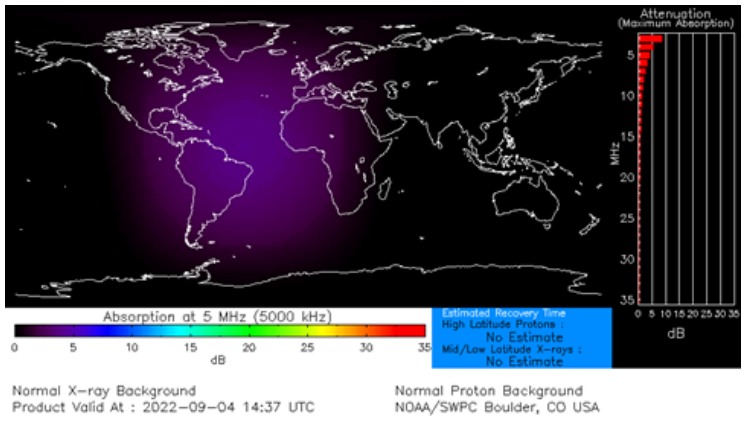
Above Image Credit: SDO/HMI

Sunspot AR3089 had a 'beta-gamma-delta' magnetic field that harbored enough energy for X-class solar flares. X-class flares are big, they are major events that can trigger planet-wide radio blackouts and long-lasting radiation storms.

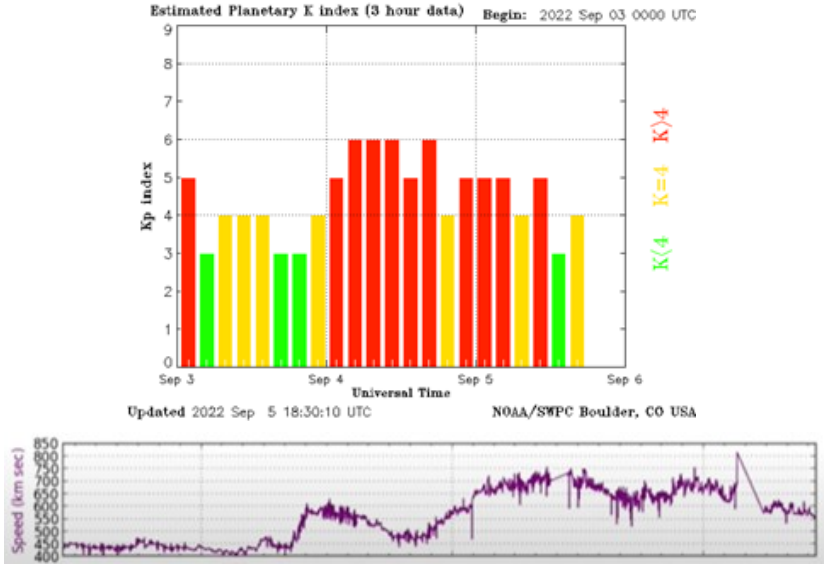
The Radio Sun: 10.7 cm flux: 123 sfu. Kp= 6 storm.







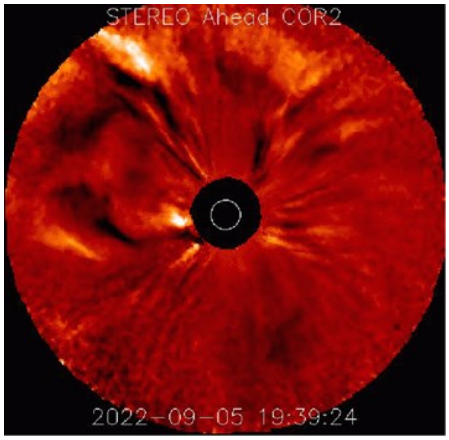
Incredible displays were a combined result of two factors: (1) the solar wind was blowing very fast, at one point topping 700 km/s; and (2) a series of cracks opened in Earth's magnetic field, allowing the solar wind to penetrate deeply. It was a perfect G2-storm



Fastest coronal whole solar wind of the sunspot cycle drove lasting geomagnetic storms throughout

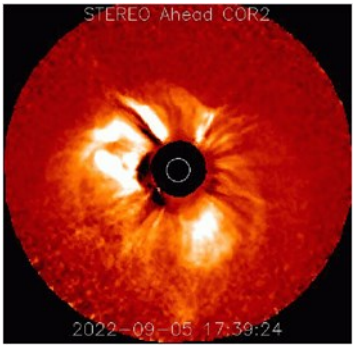
the day and early morning hours.

A MAJOR EXPLOSION ON THE FARSIDE OF THE SUN



Something big exploded on the far-side of the sun. NASA's STEREO-A spacecraft recorded a magnificent full-halo CME emerging during the late hours of September 5th.

Echoes from the far-side sunspot was so large that it was affecting the way the sun vibrates.
Plasma from the eruption was expected to impact Venus on September 7th. Venus has no internally-generated global magnetic field. The expected impact will erode some of Venus's upper unprotected atmosphere.



The September 5th event was one of the largest (if not THE largest) Solar Energetic Particle (SEP) storms that we have seen so far since Solar Orbiter launched in 2020

The >10 MeV and >50 MeV particle intensity had not subsided since the beginning of the storm.

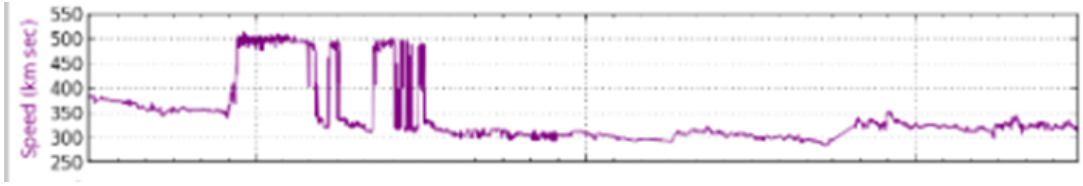
This was indicative of a very fast and powerful interplanetary shock, and the inner heliosphere may have been filled with these high-energy particles for a long time. Only a couple of these were reported during the last couple of solar cycles.

Earth was not affected by the storm, which was happening on the opposite side of the sun. However, we may not be safe from its source. The underlying explosion almost certainly happened in the magnetic canopy of AR3088, an active sunspot that popped up on the Earth-side of the sun in August. It would be transiting the far-side, apparently bigger and angrier than before. The sun's rotation would turn AR3088 toward us again in little more than a week, putting Earth back in the line of fire.

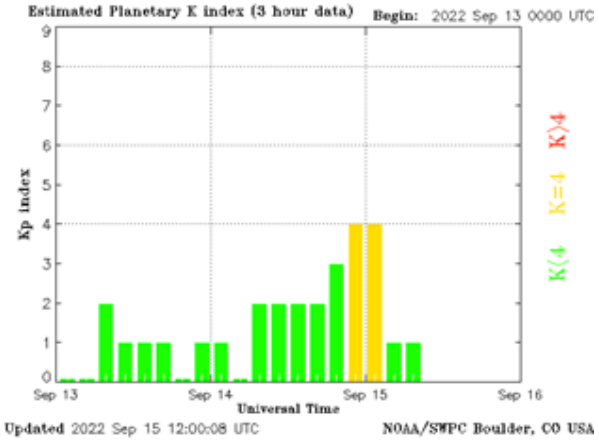
September 15th - After two weeks of quiet, solar activity starts to pickup.

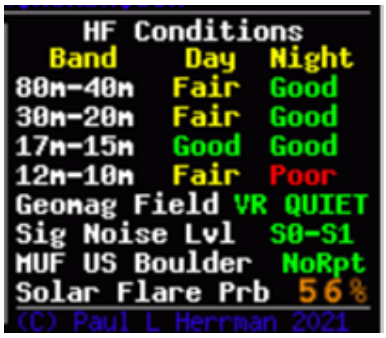
Solar wind shock waves strike Earth's magnetic field causing reverberation from a double impact. Two solar wind shock waves hit our planet on September 14th, one small (0630 UT) and one not-so-small (2313 UT). When the second shock arrived, magnetometers in Boulder, CO, registered a sudden impulse of 30 nanoTesla.

Shock waves were not in the forecasts, and their origins were unknown. On September 11th, sunspot AR3098 produced a series of seemingly minor C-class explosions while facing Earth. One or more of these may have been embedded minor CMEs in the solar wind, creating the shocks that arrived on September 14th.

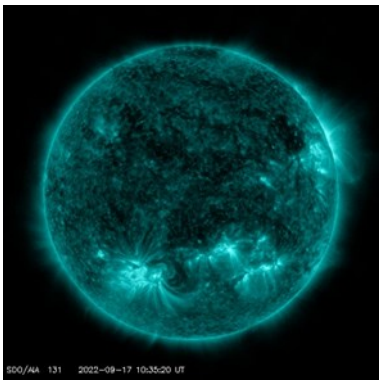


The Radio Sun: 10.7 cm flux: 144 sfu. Kp 4 and unsettled.



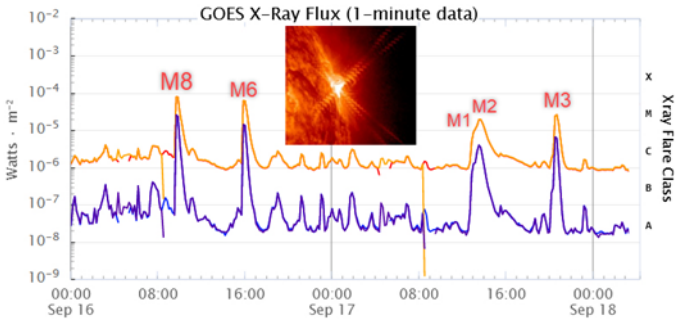


September 17th - Sunspot resurrection Just when you thought old sunspot AR3088 was dead, it's back. The decaying sunspot was growing again, adding more than 50% to its area over the preceding 24 hours.



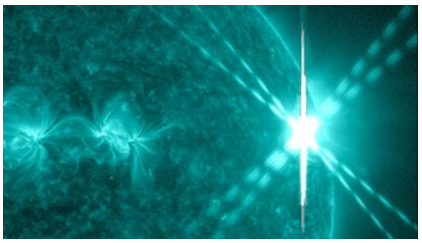
This is the sunspot's second time around the sun. The first time in August, it peppered Earth with dozens of solar flares, and later hammered Venus with one of the strongest far-side radiation storms in decades. The sunspot reappeared on the Earth-side of the sun, and was renumbered AR3102. It appeared to be in decay.

How long can Earth keep dodging solar storms? Departing sunspot AR3098 unleashed five M-class solar flares as it was going around the edge of the sun. One of them (M8 on September 16th) was almost an X-class flare.



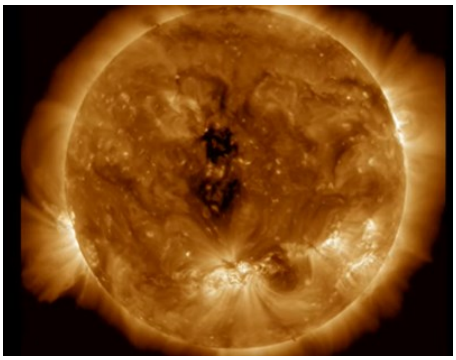
Because AR3098 was not facing Earth, all of the flares were muted in their effect, and none produced an Earth-directed CME. Add them to the list of dozens of misses since August, all produced by departing sunspots.

The sun is shooting like an Imperial Storm Trooper. Don't get used to it though. As Solar Cycle 25 unfolds, a stray hit is inevitable.



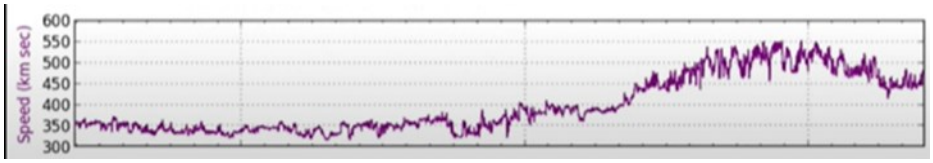
The largest explosions in the solar system get rewarded for their sheer brawn with a fitting, sci-fi-sounding name: X-class. Made visible to us by sun-observing satellites, these solar flares are awesome to watch. Loops of solar material—called plasma—leap off the sun's surface and expand to 10 times the size of Earth. The biggest flares can produce as much energy as a billion hydrogen bombs. Scientists categorize solar flares according to strength. The smallest ones are A-class, at near-background solar activity levels, followed by B, C, M, and X. Similar to the Richter scale for earthquakes, each letter represents a 10-fold increase in energy output. So an X is 10 times an M and 100 times a C. Within each letter class there is a finer scale from one to nine. Although X is the last letter, there are flares more than 10 times the power of an X1, so X-class flares can go higher than nine. As the sun approaches the peak of its 11-year cycle, expect more activity like the X6.9 flare on August 9th , 2011, seen above. Its brightness briefly overloaded satellite imaging sensors.

September 19th -



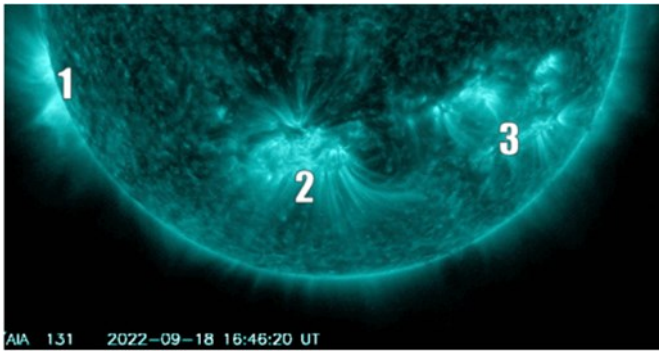
A large coronal hole was crossing central heliographic longitudes and the eruptive activity was continuing on the south incoming limb. Neither one of those were going to impact earth. The northern flare

making sunspot departed, turning our focus squarely on the south sun spots plasma filaments. That incoming region which produced an eruption, of enhanced solar wind from the coronal hole, was producing an enhancement in solar wind, preconditioning earths magnetic field for the geomagnetic storms later in the week. Note the rise in the purple line depicting solar wind speed in the chart below.



Thermospheric conditions associated with the loss of 40 Starlink satellites.

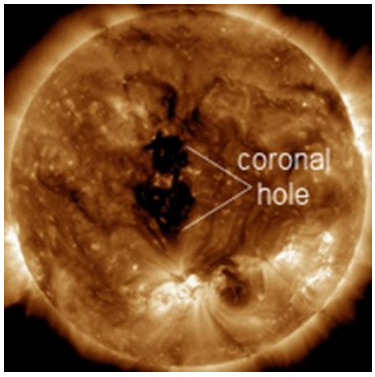
The thermospheric conditions were tremendously impacted earlier this year. These are the sort of density effects we'd expect to see with much greater solar storms, and as earth magnetic field continues to weaken. This will allow for more and more direct impacts from weaker space weather, and that is only going to continue as well.



Simultaneous explosions on the sun. September 18th , the sun's southern hemisphere convulsed all at once. NASA's Solar Dynamics Observatory (SDO) recorded three apparently simultaneous explosions more than a million kilometers apart.

Coincidence? Maybe not. Twelve summers ago, SDO witnessed an even bigger eruption with a dozen significant shock waves, flares, filament eruptions, and CMEs spanning 180 degrees of solar longitude. Researchers studying the event realized that the blasts were a chain reaction connected by wide-ranging faults ("separatrices") in the sun's global magnetic field.

A CME left the sun following the triple explosion, but the jury's was still out on whether it would hit Earth. NOAA analysts were modeling the cloud's trajectory as it came our way.



Above Image Credit: SDO/AIA
Solar wind flowing from this equatorial coronal hole was expected to hit Earth's magnetic field on Sep-

tember 22-23.

September Equinox Marks the Start of Fall 2022
During the weeks around equinoxes, cracks form in Earth's magnetic field. Even a slight gust of solar wind can slip through and disrupt HF propagation.

Space Storms Destroy Elon Musk's Starlink Satellites, and the Problem Is About to Get Worse

Back in February, 38 of Musk's Starlink satellites were annihilated by a CME. These incidents are expected to get worse in the near term, peaking in 2025. As the satellites began to sink, they ultimately burned up in earths upper atmosphere. When the satellite internet network goes down, will you be ready to provide emergency communications? When all else fails, amateur radio works, (Keep your batteries charged).

Joint USAF/NOAA Solar Geophysical Activity Forecast

Solar Activity Forecast: Solar activity is expected to be low with a chance for M-class flares

GMS: A Week Filled with Flares, August 2022 (nasa.gov)

73,
Fred
AA0JK

The Denver Radio Club
is an ARRL Special Service Club

Support your hobby and *join the ARRL today!*

http://www.arrl.org/

DRC's Trading Post

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

ATTENTION

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

Past Round Table Pages

Provided By Fred Hart, AA0JK

From the November 1960 edition.

ON FREQUENCY

By Walt, WØWRO

When you speak of DX, you have to mention Pete Wessel, WØJYW. Pete now has 244 countries confirmed on phone. He does it with an HT-32 running into a homebrew 600-watt final. He has thre elements on 15 and three on 20. The receiver is the Heath kit Mohawk, and he's very happy with it.

Pete's wife, Martha, is KØEPE. She's fast closing the DX gap with 115 countries worked, 80 confirmed. Martha is district chairman of the YLRL and a member of the LCL net. Both Wessels are interested in getting some sort of DX organization formed in Denver—perhaps within the framework of the Denver Radio Club.

Milo Adamson, WØYEB, is more of a ragchewer than a DX hound, but he has the gear to tackle anything. He's using a pair of 4E27A's in a 750-watt homebrew final. He modulates with 803A's. If that isn't enough, he has a single-sideband linear kilowatt. he receiver is a 75A-4. The antenna farm consists of a 40 and 75 meter inverted doublet and a Gonset Tri-bander on 10, 15, and 20.

As announced last month, we're waiting for Denver amateurs to call the author with operating news for each column. We're still waiting.

Ø—Ø—Ø

NIGHT IS LIGHT

A new electronic vision tube will enable soldiers to fire weapons or drive tanks on the darkest night.

It could increase the range of night-time vision up to 20 times.

Development of the tube was announced at Army engineering center by John Johnson of the Army's research and development laboratories.

The new tube intensifies the images of objects bathed by "sky glow" light. That is the dim but always present light that exists in the sky at night even when there is no moon and the stars are blanked by clouds.

Amplifying on his report, Johnson said the newly developed tube would allow the following:

1. An infantry soldier could spot an object at 500 to 1,000 yards, even though he couldn't see it with his naked eye.

2. Drivers of military tanks and other vehicles would have vision up to 200 feet without the use of headlights.

SIX METERS AND UP

By GLENN, WØIJR

Preparations for the fourth annual Christmas Banquet of the Mile Hi Highbanders are in the final stages now. We have decided on the Little Banquet Restaurant near 13th and Broadway again this year.

Saturday, December 10, at 7:30 p.m. will be the time. The price, including everything, will be $2.00 per person. We are asking that the reservations be made and paid for in advance this year. In order that we can make better plans for a memorable evening, we must know how many will attend by November 26. Please have your reservations and money in by that time.

Send your check or money order to our net secretary, Charles Simmons, KØSMOH 1490 S. Hudson St., Denver.

All amateurs are welcome. You need not be a member of the Highbanders or even a VHF enthusiast. Members of the Denver Radio Club and their families are particularly welcome.

For any additional information, contact the writer at HA 9-7287 or Dennis Boruchin, KØBTO, at AT 7-4787.

Quite a number of very short openings were reported during October. On one opening via phone patch from Texas, Mark K5JPG, sent his regards back to the six meter gang through KØBTO. He expressed thanks for all the consideration he received during his hospital stay at Fitzsimmons.

New calls to the six meter gang are: Tom, KØIUF; Dale, K9VIX/Ø; Tom K5SBK/Ø.

XE3AIA is desperately looking for Colorado for his WAS certificate. He has every state but this one. Watch for him on 50.104 Mc.

We finally have a "Hootowl" in the group. John Cox, KØRRS, while roaming

(Continued on Page 11)

GOOFED

Last months issue (page three) two names were inadvertently omitted from ARRL Official Bulletin #768. As you noticed from your official ballot, we left out the names of Chic Cotterell, WØSIN, for director and Les Richards, WØICR, for vice director. We of the Round Table regret our error and promise to never make another one nearly so serious.

Page Three

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

Random Site Of The Month
Random Animal Facts

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

The Round Table Archive

Go to: w0tx.org/roundtable

The Round Table Article Index

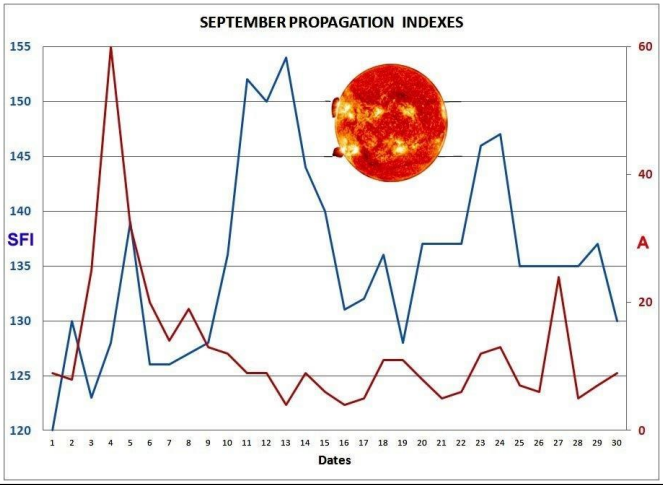
Go to: w0tx.org/RoundtableArchive/-RoundTables-Index.pdf

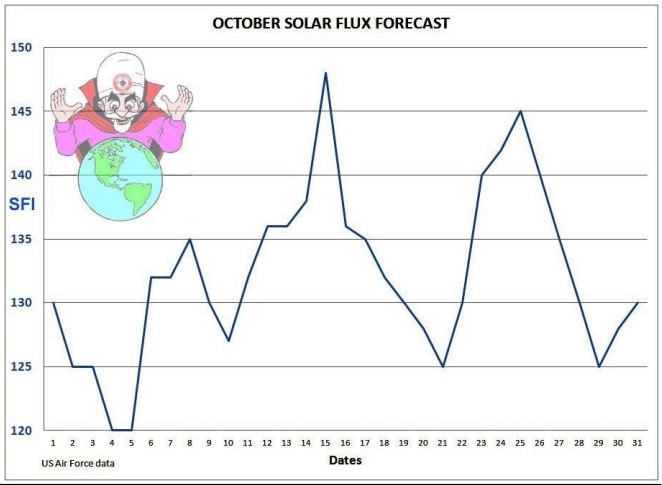
Past & Future Propagation Conditions

By Bill Rinker, W6OAV

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

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





Upcoming Events
Hamfests & Conventions

Event	Date	Location	Sponsor Website
None			

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
California	10/01/2022	10/02/2022	California QSO Party	
Nevada	10/07/2022	10/09/2022	Sierra Nevada Amateur Radio Society	
Arizona	10/08/2022	10/09/2022	Arizona QSO Party	
Pennsylvania	10/08/2022	10/09/2022	The PA QSO Party Association	
South Dakota	10/08/2022	10/09/2022	Prairie Dog Amateur Radio Club	
New York	10/15/2022	10/16/2022	New York State QSO Party	
Illinois	10/16/2022	10/17/2022	Western Illinois Amateur Radio Club	

ATTENTION

SUPPORT THE DRC FROM YOUR AMAZON PURCHASES

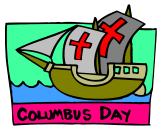
You can now support your Denver Radio Club when you make purchases from Amazon.com. Amazon Smile donates 0.5% of your purchase to the non-profit (501.c.3) organization of your choice. This is at no additional cost to you. To support the DRC just visit smileamazon.com. Select Denver Radio Club, Inc. as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

DRC Repeaters

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

OCTOBER 2022

DRC Net Sundays at 8:30 p.m. on 145.490 / 448.625 (no PL)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 **Collegiate QSO Party -** Begins 0000 UTC
2 **Collegiate QSO Party -** Ends 2359 UTC First Quarter	**3**	**4**	**5** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	**6**	**7**	**8**
9 Full Moon	**10** 	**11**	**12** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	**13**	**14**	**15** **EME Contest -** 0000 UTC
16 **EME Contest -** Ends 2359 UTC	**17** **School Club Roundup -** 1300 UTC Last Quarter	**18**	**19** **DRC Online Meeting** Elmer 6 p.m. Meeting 7 p.m.	**20**	**21** **School Club Roundup -** Ends 2359 UTC	**22**
23 **30**	**24** **31** 	**25** New Moon	**26** **Learning Net** 7:30 p.m. 145.490 / 448.625 (No PL)	**27**	**28**	**29**

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

DRC Board of Directors

President	W0GV	Gerry Villhauer	303-467-0223	president@w0tx.org
Vice-President	K0KPS	Kevin Schmidt	303-475-9234	k0kps@arrl.net
Secretary	WW0LF	Orlen Wolf	303-279-6264	secretary@w0tx.org
Treasurer	N0CRZ	Cathy Villhauer	303-467-0223	treasurer@w0tx.org
Board Member	N0XRX	Mark Thomas	720-438-0848	n0xrx@w0tx.org
Board Member	K1DBC	Doron Ben Chaim	720-254-1561	k1dbc@w0tx.org
Board Member	WG0N	Dave Baysinger	303-987-0246	wg0n@arrl.net
Board Member	KB0CHT	Jeff Irvin	*Check Roster*	*Check Roster*

DRC Staff and Volunteers

Benevolent		Carolyn Wolf	303-279-1328	benevolent@w0tx.org
Club Librarian	WG0N	Dave Baysinger	303-987-0246	wg0n@arrl.net
Digital Committee	W6OAV	Bill Rinker	Check Roster	digital@w0tx.org
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Please Let Us Know

Over the years we occasionally hear from hams who have read the Round Table in other states and countries around the world. We appreciate the comments and we would like to know where you are located. So if you live outside the Front Range or Denver Metro Area and read the newsletter either online, email or hard copy please send a short note via email with your *City, State* or *City, Country*.
We will publish it at a later date in our new regular feature called Round Table Round World.
To respond to this request send your information to roundtable@w0tx.org.

Subject: I'm located in…

Editor's Note

DRC members - this is your newsletter. Please email your club or amateur radio related suggestions to the editor. Members are the heart of The Denver Radio Club, so if you have an expertise or an interest in a particular segment of ham radio that you'd like to write about, you may email your submissions to roundtable@w0tx.org. The submission deadline is the 25th of the Month. ~ Editor