

From the NCARC President

Joe Hawley KDØTYU
president@ncarc.net

NCARC's Field Day was great. I want to thank Greg, who has been setting this up for many years and has always outdone himself every year. We had an excellent turnout, and I like to see people wandering around asking questions of the operators. Many folks don't know what HF operation is about, and this is an excellent learning opportunity.

We will take a few weeks off to enjoy summer because we've all worked hard on club projects. I've got a few ideas for August and September that will be released shortly. Until then, have a great summer, and thank you so much for supporting the Northern Colorado Amateur Radio Club.

Public Affairs Office

Dave Winnett WØDDZ
pao@ncarc.net

Numbers as of July 11, 2023

YouTube

Views (last 28 days): 2,210

Watch time (hours, last 28 days): 306.4

Subscribers: 2,628

New Subscribers (last 28 days): 15

Facebook

Members: 554

New Members: 1

From the camera at Horsetooth



Club Meeting

Saturday, July 14, 2023

8:00 am Golden Corral opens- breakfast and socialize, **9:00 am** club meeting

LIVE and IN PERSON at
The Golden Corral
1360 Sculptor Dr, Loveland CO 80537

PLUS

Zoom streaming - All members will receive a link to the online broadcast
If you don't receive a link by Friday before the meeting, please email treasurer@ncarc.net
You choose what you feel comfortable doing: attend in person or online.

Topic:

SHOW and TELL!!!

**Bring the fun, inventive, curious, interesting, educational!
Show it off!**

**Presented by:
All members welcome! Including those on Zoom!**

Next meeting:

August 19, 2023

Tech Report

James Cizek, KIØKN
techchair@ncarc.net

July 2023

Horsetooth

Thanks for NØEMP and NØNYY for installing the batteries that were recently donated to us on the Horsetooth repeater stack. That will help us keep things running much longer during power outages. Things on Horsetooth are running nominally.

The digipeater has been reported to be less sensitive than it once was. I have this on the list to look at soon. The Winlink station is operating normally.

Buckhorn

Currently, the largest outstanding issue we have is the intermod/digital signal on 447.700. We are working on replacing both the Buckhorn repeaters with a set of new repeaters that match Horsetooth.

There is currently an issue with the 447.700 power amplifier that causes power output to fall off as it heats up (putting out close to 90 watts when cold and down to 20 watts when it's warm). The replacement repeaters will both be 100 watt units. Hoping that the replacement repeaters (which will have preselectors on the receivers) may help resolve the noise problems we are having on the UHF machine as well. I am still working on troubleshooting the autopatch problem on Buckhorn and hope that we'll make some progress on that soon.

Marc Illsley Clarke, W2MIC

April 2, 1954 to July 4, 2023

We've lost a great friend and radio enthusiast. Marc Clarke, W2MIC, passed away at home. Marc had been in contact with Bart, NØNYY, through Monday afternoon (7/3), via text and email, but not since then. In the past, it had not been uncommon for Marc to drop off the grid for a couple of days at a time, due to not feeling well. By Thursday morning, Bart became concerned when Marc did not respond to phone calls, text or radio calls.

On Thursday afternoon, July 6th, with no response at the door, a welfare check was conducted, and Marc was found deceased in bed. The coroner responded and made a preliminary estimate that the death occurred on July 4th. There were no signs of foul play, and after gathering medical history and investigating the scene, Marc's body was released to the funeral home.

Anyone wishing to make a donation in Marc's memory may donate to the youth shotgun program for the Mound-Westonka Secondary School. Marc's brother Wade coaches the shotgun program there. Donations are through the Midway USA Foundation and are matched in dollar amount by the foundation.

Here is the direct link: <https://www.midwayusafoundation.org/team-profile/?id=R50432>

An obituary was not available at the time of publication. Check here for information: <https://www.dignitymemorial.com/obituaries/loveland-co/marc-clarke-11366333>

Treasurer's Report

Darren Kalmbach KCØZIE

treasurer@ncarc.net

June 2023

Account	Checking	Raffle	Savings	PayPal	Total
Beginning Balance	\$8,432	\$2,783	\$1,110	\$7,077	\$19,401
Deposits	\$0	\$0	\$0	\$236	\$236
Transfers	\$0	\$0	\$0	\$0	\$0
Withdrawals	\$400	\$0	\$0	\$9	\$409
Ending Balance	\$8,032	\$2,783	\$1,110	\$7,304	\$19,228
Outstanding Items	\$0	\$0	\$0	\$0	\$0
Net Balance	\$8,032	\$2,783	\$1,110	\$7,304	\$19,228
Net Change	-\$400	\$0	\$0	\$227	-\$173

Project	This Month	Previous	Total	Budget
QRV4	\$	\$ 1,143.62	\$ 1,143.62	\$1,200.00

Expenses: Storage, HF Class, Tech Class

Revenue: Memberships

Membership Activity:

June 2023: 233 (9 new)

June 2022: 223

Did You Know?

A regular contribution from Bob Schmid, WA9FBO

Coin Cells

Lithium coin cells are popular for powering many electronic products. Ever wonder why?



A single cell outputs 3 V – about double that of other common types – so many designs need only one. They’re small, reliable, don’t easily leak, and have a low self-discharge rate.

Here’s how to decipher the part number.

The first letter, B or C, is the battery chemistry. “B” indicates poly-carbonmonofluoride lithium, which has higher energy density and a flatter discharge curve. It’s good for memory backup, timekeeping, and similar applications that draw a low, fairly constant current. “C” indicates manganese dioxide lithium, preferred for loads involving high-current pulses.

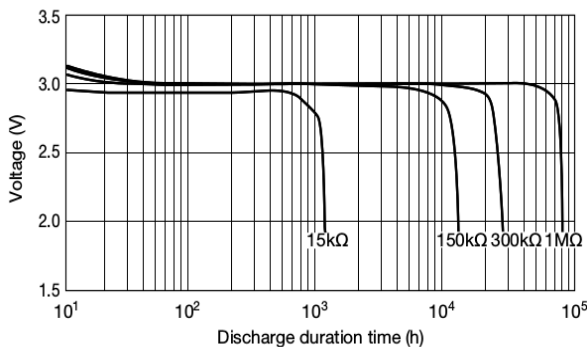
The next letter indicates the shape (“R”, for round).

The following two digits are the diameter in millimeters. The last two digits are the height in tenths of millimeters.

So, a BR2032 is a round, poly-carbonmonofluoride lithium cell, 20 mm in diameter and 3.2 mm in height. Its datasheet shows a capacity of 180 milliampere-hours (mAh).

To find its lifetime, divide its capacity by the load. For a BR2032 with a 5 μ A load, the lifetime is 180 mAh/0.005 mA = 36000 hours = 4.1 years.

When it comes to voltage, note that a brand-new cell can measure more than 3 V due to a “surface charge” that disappears quickly. Cell specifications usually show the nominal voltage as 3 V, but the exact voltage depends on the chemistry. Over their lifetimes, CR cells measure about 2.9 V and BR cells measure about 2.7 V.



As seen in the graph, a lithium coin cell maintains a nearly constant output voltage – until it’s nearly dead. That means a voltage measurement doesn’t tell you much about its remaining life!

Finally, how do you measure the very low currents associated with coin cell applications? A good way is to place a 1 k Ω resistor in series with the cell and measure the voltage drop across the resistor. For every 1 mV of voltage drop, 1 μ A is flowing through the resistor.

Get the Goods!

The [NCARC Store](#) is open for business! We have stickers, t-shirts, patches, water bottles and keychains. We still have monogrammed clothing too.

<http://www.ncarc.net/?q=node/424>

It's Never Too Late to Renew!

Renew your NCARC membership.

It's quick and easy.

[Click here!](#)

It's also never too late to start planning for Christmas: Santa on the Air

The Longmont Amateur Radio Club and the Northern Colorado Amateur Radio Club will again participate in the Santa On The Air program, and we need your help. We're looking for individuals who want to play Santa and his Elves.

The Longmont Amateur Radio Club has run this event for many years and can supply any training you would need to perform these duties. This is an excellent opportunity for the two clubs to work together to bring holiday joy to everyone. If you are interested in helping us out, please send Joe Hawley an email: president@ncarc.net. *(Editorial note: I was an "Elf" last year and it was great fun!)*

Radio Programming

If you would like to learn how to program your radio, please contact Joe Hawley at president@ncarc.net to express your interest.

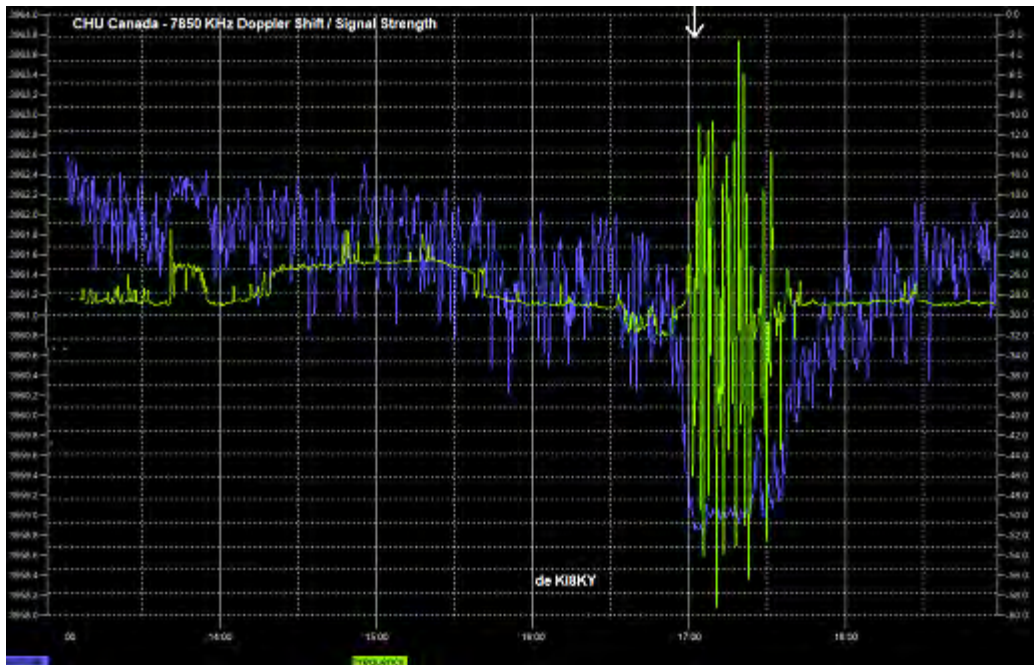
The Board is considering setting up a Saturday afternoon class in August and would like to know how many would like to participate.

A New Way to Detect Solar Flares

By Dr. Tony Phillips

Reprinted with permission from Spaceweather.com, originally published 22 Jun 2023

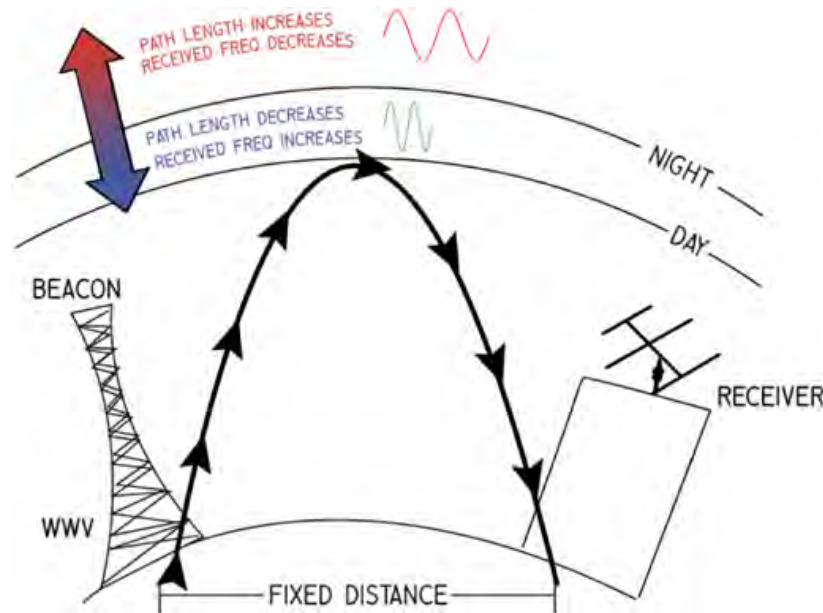
Around the world, ham radio operators are experimenting with a new way to detect solar flares--[the Doppler Shift method](#). Brian Curtis of Sault Ste Marie, Michigan, demonstrated the technique on June 20th when the sun produced a powerful X1.1-class solar flare:



"I monitor the frequency and field strength of Canada's CHU time station transmitting at 7850 kHz," explains Curtis. "During the X-class flare event, I was able to detect the Doppler shift of the station's carrier frequency (green plot). It shifted by 5 Hz, which is a small change, but very obvious!"

When radiation from a solar flare hits Earth's atmosphere, it ionizes the air, temporarily boosting the thickness of our planet's ionosphere. Any radio station skipping off the ionosphere will suddenly find its frequency Doppler shifted (because its reflection point is moving). Shortwave stations such as [WWV](#), [WWVH](#), and [CHU](#) transmit carriers with atomic-clock grade frequency stability, so they are perfect sources for Doppler monitoring.

A New Way to Detect Solar Flares (continued)



"I have been monitoring radio stations for decades, noting sudden changes in signal strength as a means of monitoring space weather events," says Curtis. "It is only fairly recently (~4 months) that I started to experiment with monitoring the Doppler shift of HF stations. The June 20th X-class flare event is by far the most dramatic that I have witnessed thus far."

Would you like to detect solar flares this way? The [HamSCI](#) citizen science program has developed a [Personal Space Weather Station](#) specifically for Doppler shift measurements. This technique can also be used to study [solar eclipses](#), [earthquakes and tsunamis](#), and [much more](#).

Peak-to-Peak Highway Special Event

On September 30th, the Northern Colorado Amateur Radio Club and five other radio clubs will host a special event for the 105th anniversary of the Peak-to-Peak Highway. The Peak-to-Peak Highway begins as state highway 7 in Estes Park, brings you past the tiny town of Allens Park on state highway 72, then heads to Nederland. From there, it goes south onto state highway 119 through Blackhawk, into Clear Creek Canyon and ends at Interstate 70.

There will be 5 or more clubs participating, and each club will have two or three predetermined sites along the trail. The event will last eight hours, with operators working two-hour shifts. This special event will encompass HF on three modes: SSB, CW, and FT8, and various frequencies. Special event QSL cards will be sent to each contact.

If you are interested in participating, [Click Here](#) to sign up. Or email Joe Hawley at president@ncarc.net for more information!

Amateur Radio Fun in the Colorado Mountains

August 4 through 7, 2023

www.ham14er.org

Amateur Radio operators from around Colorado will be climbing Colorado **Summits On The Air** (SOTA) peaks and communicating with other radio amateurs across the state and around the world. Join in on the fun during the annual event by activating a summit or contacting (chasing) the mountaintop stations. This event is normally held the first full weekend in August. This year we will add **two bonus days** to the Colorado 14er Event. The main two days remain **Saturday and Sunday (Aug 5 & 6)**, while the bonus days are **Friday Aug 4 and Monday Aug 7**, for those SOTA enthusiasts that need more than two days of SOTA fun! Be aware that many mountaintop activators will hit the trail early with the goal of being off the summits by noon (1800 UTC) due to lightning safety concerns.

The 14er event includes **Summits On the Air (SOTA)** peaks, which provide over 1700 summits to activate. (See the W0C SOTA web page or browse the SOTA Atlas.) The Colorado 14er Event was started in 1991, about 19 years before the SOTA program was set up in Colorado. As SOTA grew in popularity, this event expanded from just the 14,000-foot mountains (14ers) to include all the SOTA summits in the state. We still call it the Colorado 14er Event because, well, that's where it all started and the 14ers are the iconic summits in the state.

Important: The recommended 2 m frequencies have been changed to 146.58, 146.55 and 146.49 MHz, to align with the use of the **North America Adventure Frequency for SOTA (146.58)**. The National Simplex Calling Frequency (146.52) may be used as appropriate. There will be plenty of action on the other ham bands, for more information see the operating frequencies page.

Resources:

[Colorado 14er Event webpage](#) – Everything to Know About the Colorado 14er Event

[Beginner Guide](#) – For the first-time activator

[Ham14er Groups.io](#) – Discussion Group for the event

[Colorado SOTA groups.io](#) – Colorado SOTA discussion group

Colorado 14er Event Task Force: info@ham14er.org

For 2 meters:

146.580 Calling Frequency

146.550 Simplex Alternate

146.490 Simplex Alternate

For 70 cm:

446.000 Calling Frequency

446.025 Simplex Alternate

Field Day

Even though wind and weather kind of spoiled the conditions – it was still a great day! Thanks Greg, NØEMP!



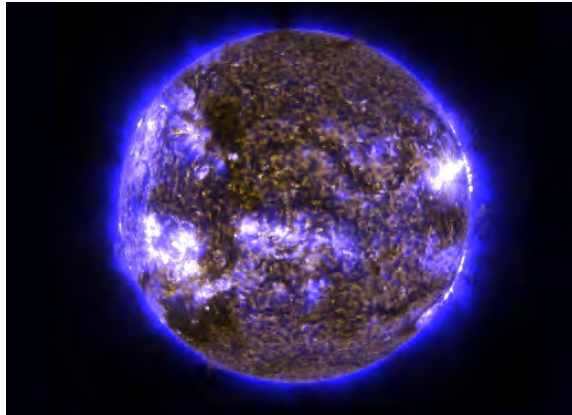
Radio Amateurs “Hack” a NASA Spacecraft

By Dr. Tony Phillips

Reprinted with permission from Spaceweather.com, originally published 6 Jul 2023

Ham radio operators are picking up a strong signal from space. It's NASA's STEREO-A spacecraft returning home after 17 years.

"I'm having fun with STEREO-A," reports Scott Tilley (VE7TIL) of Roberts Creek, British Columbia. "The spacecraft is coming close to Earth this summer, and I can now receive its signal using a small [26-inch dish](#) in my backyard." Here is what he picked up on July 2nd:



See also an [animated version](#) of these data.
The X-flare is [right here](#).

"We caught an X-flare in progress," Tilley says. "Naked-eye sunspot AR3354 was really crackling."

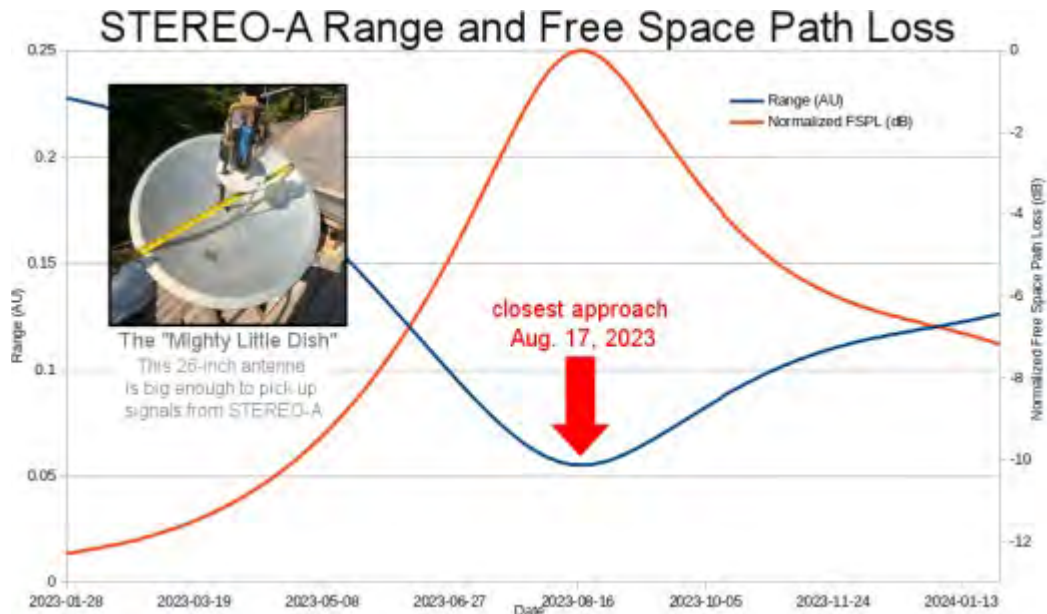
STEREO-A left Earth on Oct. 26, 2006, launched from Cape Canaveral with its sister ship STEREO-B. Both spacecraft were on a mission to the farside of the sun. Over the years, they would circle behind the sun, beaming images back to Earth so scientists could make 3D models of solar activity. In 2014, STEREO-B failed and was not heard from again. STEREO-A kept going, and now it is on its way back.

Earlier this summer, Tilley began hearing rumors that other radio operators were picking up signals from STEREO-A at 8443.580 MHz. He decided to check it out. "The [central carrier](#) is very loud, almost 30 dB above the noise," he says. "I also noticed data sidebands, which are unusual to see on such a distant object for my small antenna."

At first, the signal was indecipherable. But Tilley found lots of information about its format posted by NASA on public websites; it wasn't a secret. Using a program called "[SatDump](#)" written by Alan Antoine (F4LAU), he successfully demodulated the data. Now, Tilley is monitoring data streams from almost all of STEREO-A's science instruments including its extreme ultraviolet imager (EUVI), two coronagraphs (COR1 and COR2), the heliospheric imager (HI) and a solar radio burst receiver (S/WAVES).

Radio Amateurs "Hack" a NADA Spacecraft (continued)

At closest approach on August 17th, STEREO-A will be only 0.05 AU (7.5 million km) from Earth. By then, signals from the spacecraft will have more than doubled in strength, making it even easier to "hack."



"What started out as a passing curiosity is now turning into a summer pastime," says Tilley. "This is a unique time to play with STEREO-A."

Hams, would you like to monitor STEREO-A? A technical blog post just published by Tilley explains exactly [how to do it](#).

July 12, 2023: A VERY ACTIVE SUNSPOT: A new hyperactive sunspot is producing M-class solar flares every few hours. This is causing shortwave radio blackouts around all longitudes of our planet. If current trends continue, an X-flare could be in the offing. Full story @ [Spaceweather.com](#).

Upcoming Ham Radio Events

Courage Classic Bicycle Tour: Jul 14, 15, 16, Copper Mountain, CO. [More info here.](#)
Contact Christian WØCDN w0cdn@comcast.net

Never Summer Race Event: Jul 28-30, 2023, Gould, CO. [More info here.](#) Contact
Wayne ADØKE

Rocky Mountain Division Convention: Aug 12-13, 2023, Albuquerque, NM. [More info here.](#)

Equinox Marathon, ½ Marathon, 5 Mile: Sep 17, Poudre Canyon, Fort Collins, CO.
[More info here.](#) Contact Marty KØMLG

Red Feather Jamboree: Sep 22-24, 2023. Red Feather, CO. [More info here.](#) Contact
Brian NØBCB

Blue Sky Marathon: Oct 21, 2023, Fort Collins, CO. [More info here.](#) Contact Darren
KCØZIE

From the Editor

Ann Donoghue KØARD
newsletter@ncarc.net

Marc, W2MIC's death was deeply sad news. He was always available, always kind, always helpful. We will miss him on the radio waves.

Please send your articles, ideas for articles and announcements for inclusion in the newsletter.