# SUNSPOTS

REDWOOD EMPIRE DX ASSOCIATION

P.O. Box 750834, Petaluma, CA 94975

**Volume XXIII** **Number II** **February 2021**


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**EDITOR:**

Alan Eshleman K6SRZ


## Meeting Announcement

**The Program for Februry 10 will be -*Why Chase Islands? - An Introduction to the IOTA Program* by Cesar Trifu, VE3LYC**

Starting out in radio as an SWL in 1968, Cesar was licensed as VE3LYC in 1995. Quoting from his QRZ.com page: "The difficulties associated with putting on the air some of the most remote islands on Earth, usually for only a very short period of time, and sometimes under precarious propagation conditions make the island chasing a remarkable challenge."

And he has certainly accepted the challenge. Check out his QRZ.com page to see his activations. This is going to be a wonderful program about his adventures to put a new IOTA on the air.

## President's Commentary

Well the rains have arrived to complement the contesting season.

Your president had a very pleasant

COVID experience. Although I am in the VA's Health System computers, I do not use them for healthcare. Last Friday received an email in the morning from the VA inviting me to get COVID shot for being over 75. Called and was sched-uled for the next day in SF. Drove to SF VA Hospital, was met at parking garage and escorted to a parking space 100 feet from entrance, given the usual COVID questions **BUT vaccinated within 5min of arriving**. Never left my car, never

Cont. next page

President's Commentary continued from previos page

filled out paperwork. Given all the problems many face with COVID vaccinations and the bad press government has received in general, it was an exhilarating experience!!!!

The club now has its own Zoom account, $169.00 for a year with recording available and up to 1G of storage. Anyone wanting to use the account please email me.

Decided to get serious about satellites and meteor scatter so have new G-5500 az/el rotator sitting in the garage which will hopefully go up in the next week. Needed to find something to do with the Icom 9700! Of course that might generate a need for VHF/UHF amps!

Although we have a commitment from Eric of Elecraft to do a Zoom meeting, think NCCC and others doing same thing earlier so will cancel that presentation.

Tried the ARRL for presentations and was not impressed with their responses. As a long-time life member I had hoped for more. Found neat place in DXLab DXKeeper, which is the logging module, showing LoTW Queue time. Once found a 10+ hour plus queue which as a computer professional doesn't make much sense.

I continue to be impressed with Alan K6SRZ's production of Sunspots. Alan we all know it's a lot of work but the results are outstanding.

Hopefully many of us will be vaccinated in the near future and then a gradual return to normal!

73 Roger N3RC

There won't be a Contest University at Visalia or Dayton this year, but fortunately much of the CU material is available online at https://www.contestuniversity.com/

Your editor had the opportunity to ZOOM into the latest offering—the 2021 Propagation Summit.

The material covered was much more detailed and technical than simple solar flux, A & K indices, and whether any particular band was was good or bad. I won't try to summarize (since I'm not sure I understood every-thing) but will instead present some of the slides from the event.

Here's the program:

11 AM – "Update on the Personal Space Weather Station Project & HamSCI activities for 2021" – Dr. Nathaniel Frissell, W2NAF

Noon – "Solar Cycle 25 Predictions & Progress" – Carl Luetzelschwab, K9LA

1 PM – "Maximizing Performance of HF Antennas with Irregular Terrain" – Dr. James Breakall, WA3FET

2 PM – "HF Propagation: what to expect during the rising years of solar cycle 25" –

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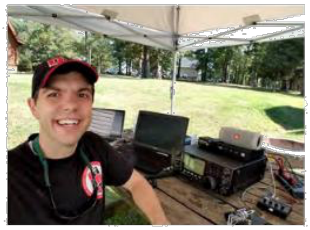
# HamSCI Ham radio Science Citizen Investigation

hamsci.org/dayton2017



*Founder/Lead HamSCI Organizer:*
**Dr. Nathaniel A. Frissell, W2NAF**
*The University of Scranton*

**A collective that allows university researchers to collaborate with the amateur radio community in scientific investigations.**

**Objectives:**

1. **Advance** scientific research and understanding through amateur radio activities.
2. **Encourage** the development of new technologies to support this research.
3. **Provide** educational opportunities for the amateur radio community and the general public.

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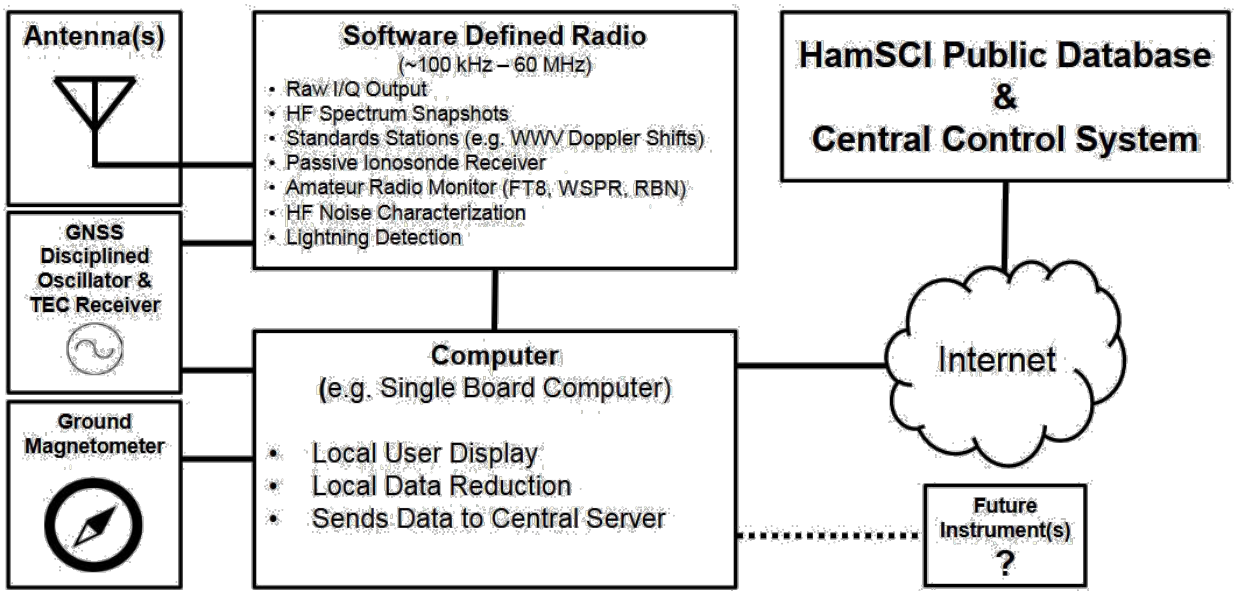
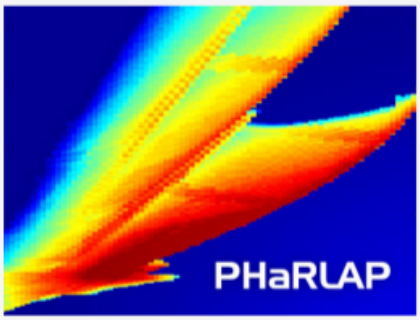
# HamSCI Personal Space Weather Station



…A project of the School of Physical Sciences at the University of Adelaide given a patriotic acronym by the scientists. Scientists *love* acronyms. A list of the acronyms used in the Propagation Summit follows on the next page.

# PHARLAP - PROVISION OF HIGH-FREQUENCY RAYTRACING LABORATORY FOR PROPAGATION STUDIES

PHaRLAP is Matlab toolbox for the study and modelling of the propagation of High Frequency (HF) radio waves in the Earth's ionosphere. It provides 2D and fully magneto-ionic 3D numerical ray tracing (NRT) engines, analytical ray tracing (ART) routines and the necessary supporting routines.




The numerical ray trace routines require gridded profiles of the Earth's ionosphere and magnetic field. Users supply their own models or employ the International Reference Ionophere and International Geomagnetic Reference Field models supplied with PHaRLAP.

The full state-vector of the ray at each point along the ray trajectory is available and user modified state-vectors may be input for advanced ray studies.

The computational engine of PHaRLAP coded in FORTRAN 2008 and compiled under Matlab into mex files which provides the speed of a compiled language with the flexibility, portability and ease of use of a modern interactive language. Currently the Linux (64 bit), Mac OS X (Intel only) and Windows (64 bit) platforms are supported.

Full online help is available within Matlab.

## KEY INFORMATION

**CONTACT**

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P +61 8 7389 7163
M +61 413 842 043

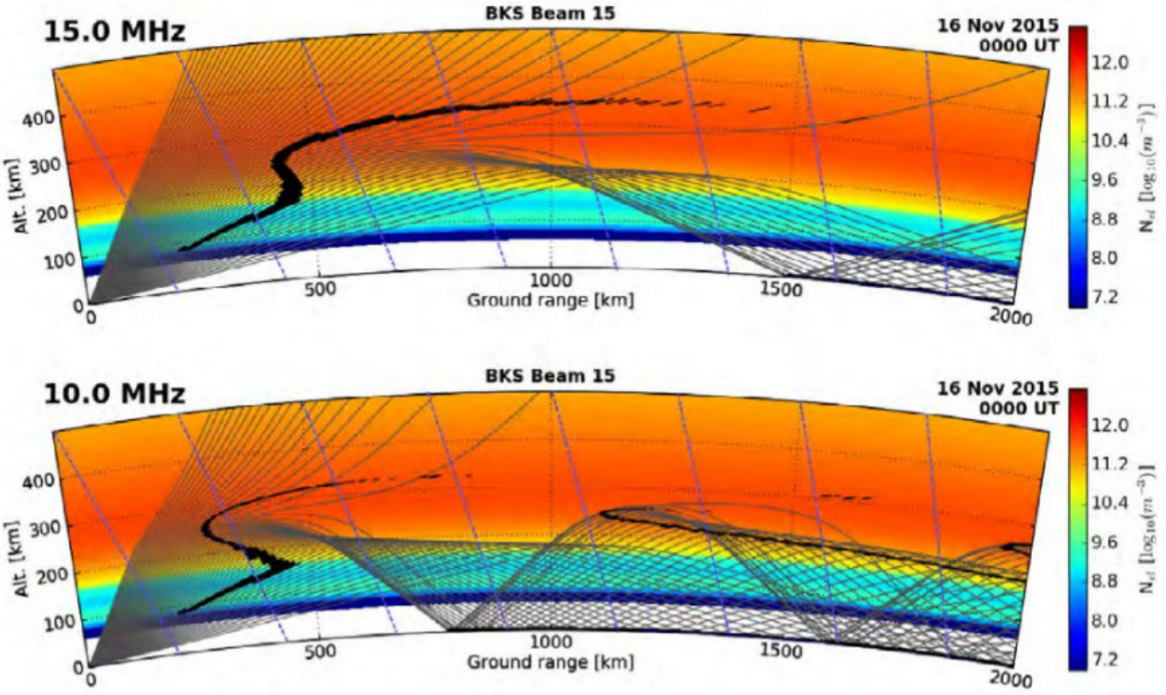
- HF radio wave ray tracing
- HF propagation modelling
- Ionospheric Physics
- Over-the-horizon radar

**Phar Lap** (4 October 1926 – 5 April 1932) was a champion Thoroughbred **racehorse** whose achievements captured the Australian public's imagination during the early years of the Great Depression. Foaled in New Zealand, he was trained and raced in Australia by Harry Telford.[4] Phar Lap dominated Australian racing during a distinguished career, winning a Melbourne Cup, two Cox Plates, an AJC Derby, and 19 other weight for age races.[5][6] He then won the Agua Caliente Handicap in Tijuana, Mexico, in track-record time in his final race.[7] Phar Lap died of gastroenteritis in 1932 in Atherton, California. At the time, he was the third highest stakes-winner in the world.

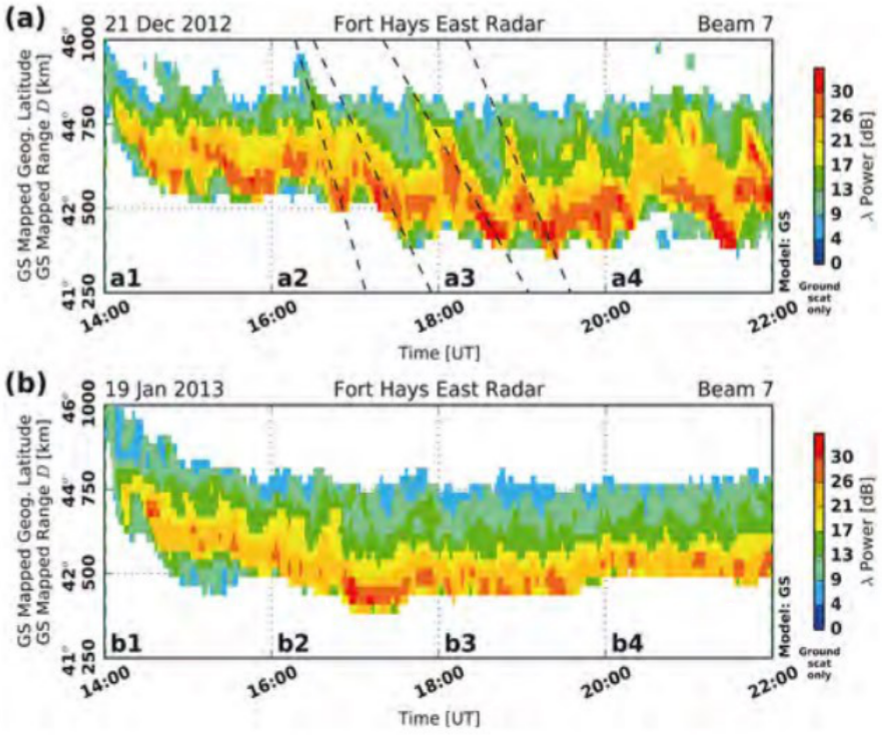
# Acronym Glossary

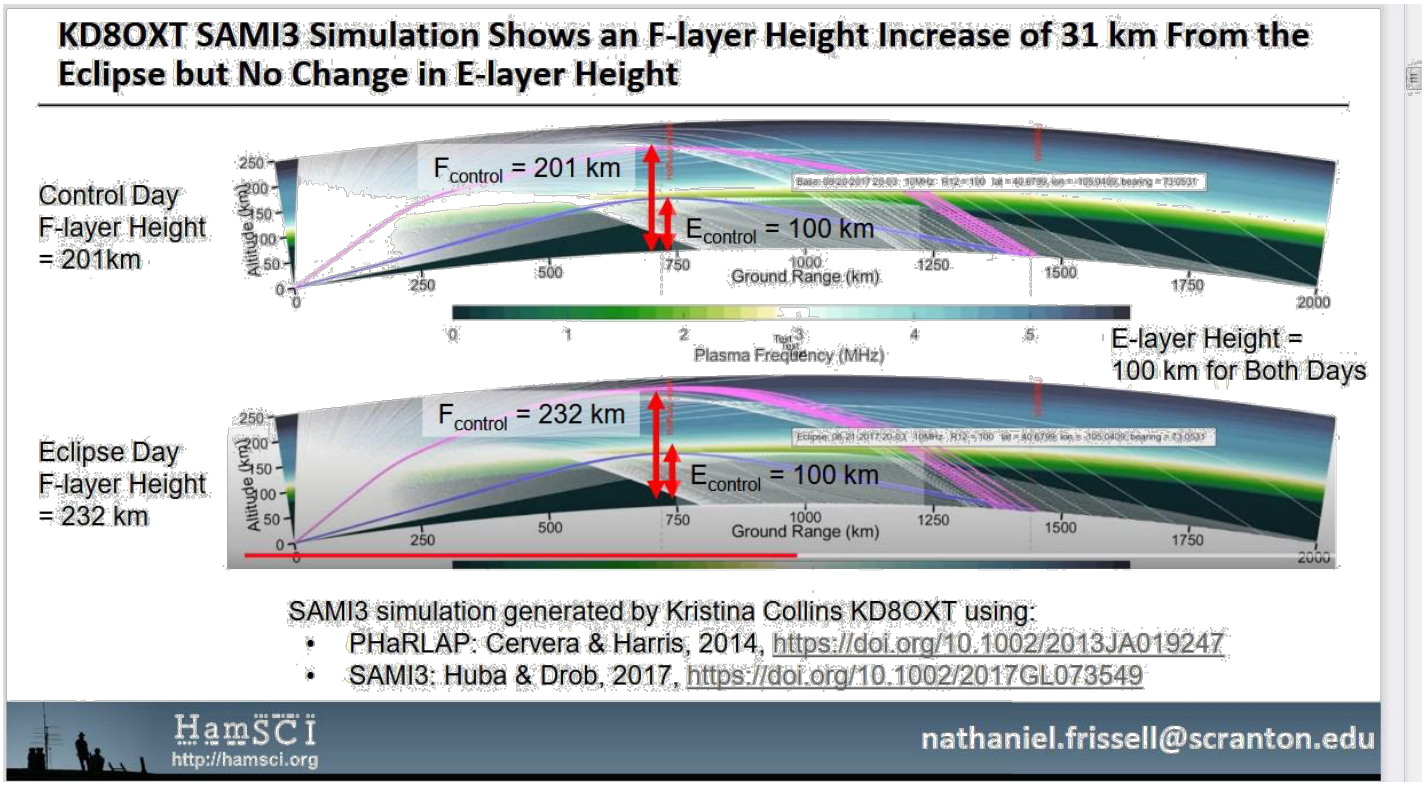
| | |
|---|---|
| **AE** | Auroral Electrojet Index |
| **BKS** | Blackstone, VA SuperDARN Radar |
| **GNSS** | Global Navigation Satellite System |
| **HF** | High Frequency (3-30 MHz) |
| **LSTID** | Large Scale Traveling Ionospheric Disturbance |
| **MSTID** | Medium Scale Traveling Ionospheric Disturbance |
| **RBN** | Reverse Beacon Network |
| **SAMI3** | SAMI3 is Another Model Ionosphere |
| **SuperDARN** | Super Dual Auroral Radar Network |
| **Sym-H** | Symmetric-H Index (For measuring geomagnetic storms) |
| **TEC** | Total Electron Content |
| **TID** | Traveling Ionospheric Disturbance |
| **WSPRNet** | Weak Signal Propagation Reporting Network |

# Refraction as a Function of Frequency




# Example SuperDARN MSTID






The SAMI3 simulations showed an eclipse-induced increase in F-layer height but no change in the E-layer.This prediction ties in nicely with many spectral recordings that show a steady frequency track along with mode splitting into multiple higher order modes during daily dawn and dusk transitions. This suggests that the frequency swings and mode splitting occur in the F layer while the steady track comes from the E-layer

## A Peculiar RFI Problem and an Unusual Solution

**Ron, N6IE**

Operating a remote station is never without its unique and sometimes obscure challenges as I have learned from several years of operating by remote. When FT8 came along in recent times, I figured it would be a great way to rack up some new DXCC entities on 160 meters but I quickly realized that I had a problem. It seems that I can operate my remote station at full legal power on 160 CW for hours on end in a contest, but the first time I fired up in FT8, the internet feed died. Any amount of power over 400 Watts caused a complete outage that required a visit to the site to fix. This also happened on six meters where the ERP of the mighty SteppIR DB42 can reach a whopping 25,000 Watts.

Many of you may remember from presentations I did in the past, that my remote station is at a ranch just outside of Petaluma about five miles from my home. The 30-acre ranch property where I rent space has the owner's home situated by the road at the far end of the property while the garage where my equipment is located is about a quarter of a mile away. Comcast/ Xfinity ends at the home and the only way to get internet to the remote equipment is by way of an inexpensive Ubiquiti 5 GHz link from the house to the garage. Due to trees and buildings in the way, the small microwave units are located on fences that require 100 to 200 feet of CAT5 cable so they can be in line-of-sight locations.

### An Odd Problem, Indeed!

For months I pondered this odd problem of FT8 killing the Ubiquiti link but not CW. Ubiquiti manufactures CPE (Consumer Premises Equipment) used by wireless Internet providers to bring service to homes and businesses on a mass scale. The big advantage is that the equipment is easy to install and inexpensive, with costs starting at as little as $100 for a complete high speed data link with a range of range of well over a mile. Obviously, the problem was RFI related since the units are otherwise extremely reliable, so the 'go-to' solution is usually ferrite chokes. But after installing an armload of them, there was no improvement indicating that this was not a typical 'common-mode' interference problem. Something else was going on!

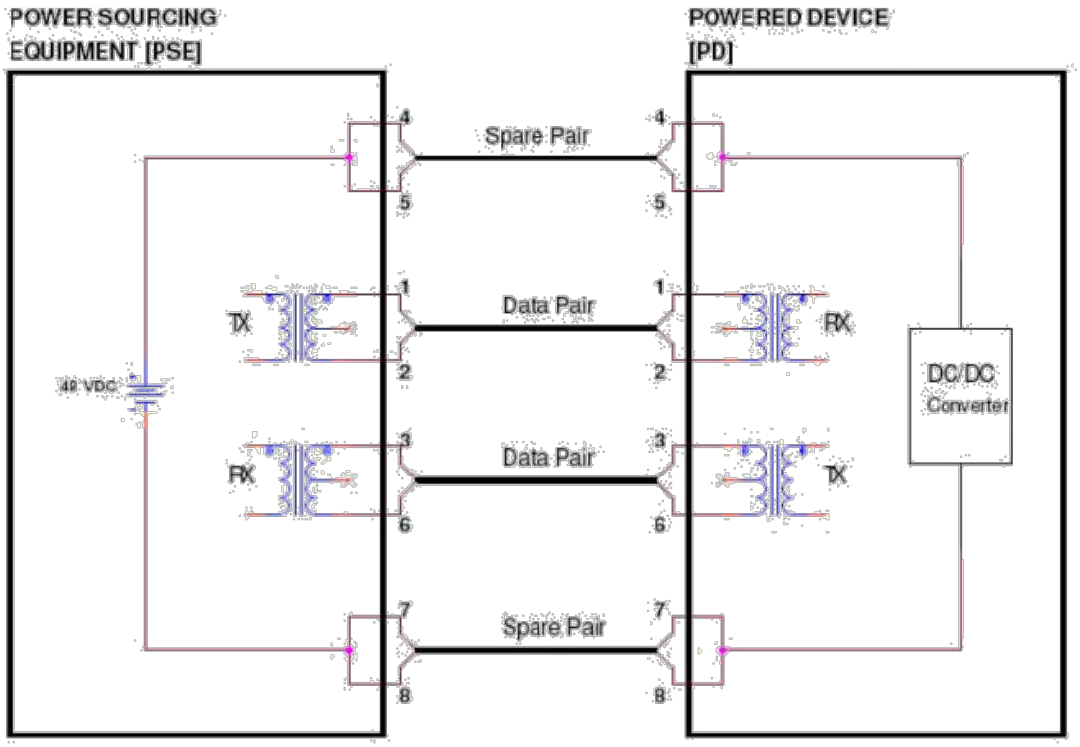

A Ubiquity Nanostation Loco M5 5 GHz radio like the one I use to bring internet to the garage. Its PoE power supply is on the right. The unit is capable of 300 Mbps and its range is up to four miles. This one was available used for just $29.00.

The Ubiquiti radios get their power from the AC socket in the house to the box outside using 'Power over Ethernet' or PoE where the Ethernet cable itself carries the necessary DC voltage. Ethernet cable typically uses only two of the four pairs of wires, the orange/white-orange and the green/white-green to carry data, leaving the other two pair otherwise unused. In a PoE sys-tem, the blue/white-blue pair and brown/white-brown pair are used carry plus and minus 24 VDC to the outside unit. DC is fed into each of the paralleled pairs that go to the Ubiquiti unit, but not to the rest of the LAN network wiring. A 'feature' is that you can reset the unit to factory defaults by sticking the end of a paperclip into either of two small holes, one on the outside ra-dio unit and the other on the indoor PoE power supply. To cause this 'hard' reset, when the pa-perclip is inserted, the DC is additionally carried on the data pair (orange and green pair) of the Ethernet cable which is used at the radio end for the reset. The data pair get DC injected by us-ing small, surface-mount, center-tapped transformers in the power supply that pass data but iso-late the DC from rest of the network. A Zener diode in the radio prevents the reset voltage from exceeding a certain limit. (cont. next page)

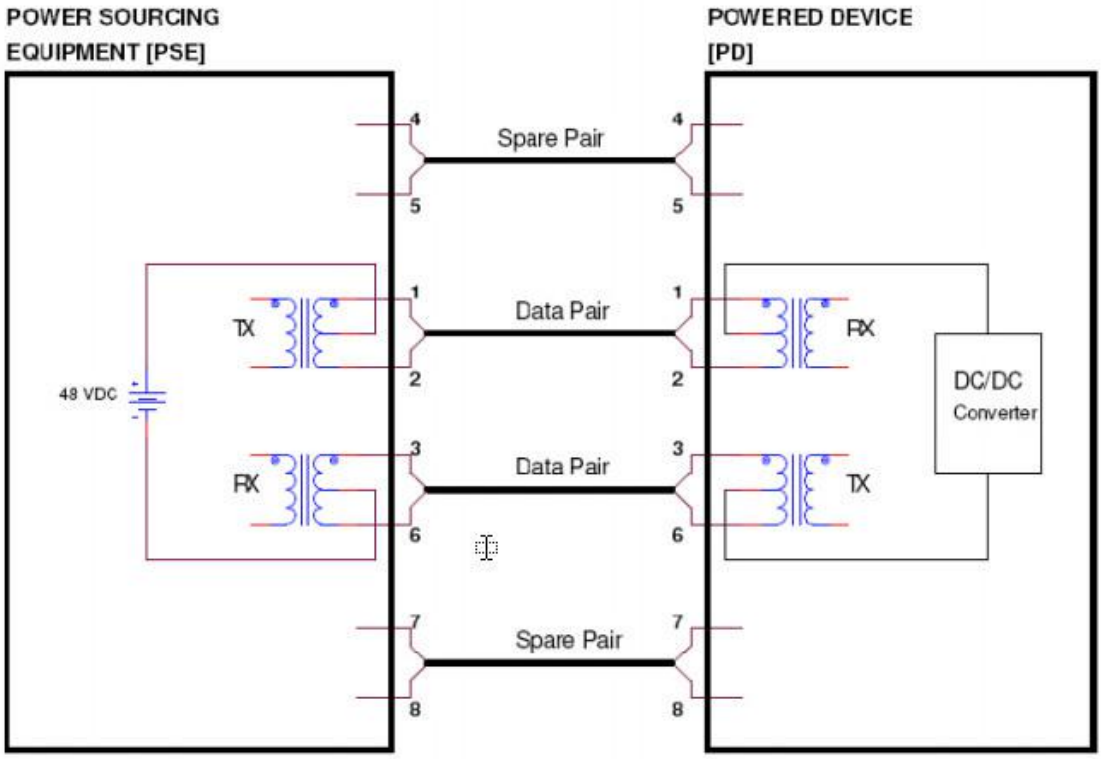
I read the Ubiquiti Nanostation M5 instructions which say to hold the reset button down for 10 seconds to return the unit to factory defaults. Suddenly the light flashed in my head! The difference between the CW and FT8 RFI is that CW runs in very short dits and dahs while FT8 is key-down for 14 seconds. The tower, which is shunt-fed on 160 meters, is less than 1/4 wavelength from the Ubiquiti radio and its 175' of shielded outside Ethernet cable. Even at 400 Watts, enough RF was being induced into the cable and rectified by the Zener to cause a factory reset. This was not a *common*-mode problem, but rather a *differential*-mode problem, which cannot be cured with ferrite chokes on the outside of the cable.

**Now, How Do We Solve This?**

There have been very few Ethernet RFI filters available for HF radio interference until recently when DX Engineering came out with their ISO-PLUS, a small box that has both common-mode and differential mode filtering. While the specifications are excellent, the unit does not pass PoE voltage. This is good news and bad news. The good news is that the reset voltage on the data pairs get blocked. The bad news is that the Ubiquiti radio needs PoE voltage on the non-data pairs to run. The solution: extract the PoE voltage from the non-data pairs *before* the ISO-PLUS and re-inject it *after*, wrapping the wire between the two injectors around a ferrite loop to kill any residual RF. This is relatively simple using commonly available PoE injector boxes which I purchased for $7.49 each on Amazon. All parts were mounted in a small watertight plastic box and secured to the 10' mast where the Ubiquiti radio is mounted. (cont. next page)




A PoE injector circuit for ordinary power on the non-data or “spare”




A PoE circuit where DC and data flow on the same pairs


The finished filter box with two PoE injectors, ferrite choke for PoE voltage and DX Engineering ISO-PLUS Ethernet filter. The 175’ shielded CAT5 cable from the shack is fed into the injector on the left.

**Does It Work?**

And how! Since installing the filter I have made over a hundred transmissions at 1,500 Watts on 160 FT8 without a single problem and in the first week after installation, I added over a dozen new countries to my confirmed list on the band and even started a couple of JA pileups! This puts me as of this writing within seven QSL's of 9-band DXCC. Although 6 meters has not been open, I have done full-power tests with no problems.

This was truly an obscure RFI problem with virtually nothing written about it on the internet, so I will post this on my site, www.N6IE.com and hopefully others having similar issues in the future will find it. In solving this problem, I learned a lot about PoE and general network infrastructure. Look for me on 160-meter FT8!


The completed filter installed. The 70' tower and DB42 are in the background

Apropos of this month's program ...Since this was taken 15 years ago, I'm guessing the statute of limitations forbidding this photo has run. Without being too specific, let's just say this was from a DXpedition (and rare IOTA) in the Pacific. The expeditioners were getting annoyed with all the requests ("more 15 M phone, please") and complaints they were getting ("you're working too many EUs") and decided to post their response.

# REDXA Contest Scores

## NAQP CW

| Call | Class | Qso | Mults | Score |
|---|---|---|---|---|
| N6IE | M/2 LP | 819 | 214 | 175266 |
| N6ZFO | SOLP | 842 | 176 | 148192 |
| K6SRZ | SOLP | 840 | 164 | 137760 |
| K6JS | SOLP | 445 | 116 | 51620 |
| K6RIM | SOLP | 387 | 122 | 47214 |
| K6MM | SOLP | 283 | 107 | 30281 |
| W6XU | SOLP | 287 | 62 | 17794 |
| N6YEU | SOLP | 112 | 52 | 5824 |
| K6CTA | SOLP | 35 | 25 | 875 |

**Soapbox**

**K6JS** - Lots of QRN on 20M made it difficult to pull out the weak ones. The folded Counterpoise under an inverted L on 80M still plays great. 53 Q's and 13 mults I wouldn't have without the FCP. Thanks for the Q's K3, DB18 @ 55', Inv. L over FCP on 80M

**K6MM** - Limited to a vertical and wires (SteppIR has pneumonia). Always a fun contest. Thanks for the Qs.

## NAQP SSB

| Call | Class | Qso | Mults | Score |
|---|---|---|---|---|
| N6IE | SOLP | 577 | 144 | 83088 |
| N6ZFO | SOLP | 527 | 136 | 71672 |
| K6SRZ | SOLP | 141 | 52 | 7332 |
| N6YEU | SOLP | 141 | 52 | 7332 |
| K6MM | SOLP | 66 | 40 | 2640 |

| | | | | |
|---|---|---|---|---|
| K6ELE | SOLP | 42 | 30 | 1260 |
| N3RC | SOLP | 36 | 28 | 1008 |
| K6RIM | SOLP | 25 | 16 | 400 |
| W6XU | SOLP | 6 | 5 | 30 |

Soapbox

**K6RIM** - Very short test of SteppIR BigIR/80 vertical.

**K6ELE** - My 40/80 switched dipole failed after 3 Q's on 40M, so I missed 80M and my goal for the contest.

**N6YEU** - Part tie effort but had fun. My apologies to the station I worked around 22:45 utc on 20 meters.He was back east as I recall.I did not hit enter and realized during next qso but too late to call him back. It was a good qso both ways .

Contest scores (cont.)

## CQ 160 CW

| Call | Class | QSO | St/Prov | DX | Score |
|---|---|---|---|---|---|
| N6IE | SOAHP | 435 | 54 | 9 | 66843 |
| W6DR | SOHP | 302 | 53 | 9 | 45384 |
| N6TQ | SOHP | 293 | 44 | 6 | 35600 |
| K6SRZ | SOHP | 203 | 39 | 5 | 23980 |
| N3RC | SOAHP | 147 | 31 | 3 | 11764 |

# PUBLIC NOTICE

Federal Communications Commission
45 L Street NE
Washington, DC 20554

News Media Information 202 / 418-0500
Internet: https://www.fcc.gov
TTY: 1-888-835-5322

DA 21-73
Released: January 17, 2021

## FCC ENFORCEMENT ADVISORY

### WARNING: AMATEUR AND PERSONAL RADIO SERVICES LICENSEES AND OPERATORS MAY NOT USE RADIO EQUIPMENT TO COMMIT OR FACILITATE CRIMINAL ACTS

The Enforcement Bureau (Bureau) of the Federal Communications Commission issues this Enforcement Advisory to remind licensees in the Amateur Radio Service, as well as licensees and operators in the Personal Radio Services, that the Commission prohibits the use of radios in those services to commit or facilitate criminal acts.

The Bureau has become aware of discussions on social media platforms suggesting that certain radio services regulated by the Commission may be an alternative to social media platforms for groups to communicate and coordinate future activities. The Bureau recognizes that these services can be used for a wide range of permitted purposes, including speech that is protected under the First Amendment of the U.S. Constitution. **Amateur and Personal Radio Services, however, may not be used to commit or facilitate crimes.**

Specifically, the Bureau reminds amateur licensees that they are prohibited from transmitting "communications intended to facilitate a criminal act" or "messages encoded for the purpose of obscuring their meaning."[1] Likewise, individuals operating radios in the Personal Radio Services, a category that includes Citizens Band radios, Family Radio Service walkie-talkies, and General Mobile Radio Service, are prohibited from using those radios "in connection with any activity which is against Federal, State or local law."[2] Individuals using radios in the Amateur or Personal Radio Services in this manner may be subject to severe penalties, including significant fines, seizure of the offending equipment, and, in some cases, criminal prosecution.[3]

Media inquiries should be directed to 202-418-0500 or MediaRelations@fcc.gov.

To file a complaint with the FCC, visit https://consumercomplaints.fcc.gov or call 1-888-CALL-FCC. To report a crime, contact your local law enforcement office or the FBI.

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[1] 47 CFR § 97.113(a)(4).

[2] 47 CFR § 95.333(a).

[3] 47 U.S.C. §§ 401, 501, 503, 510.

This recent notice from the FCC was apparently a response to the fact that some of the January 6 U.S. Capitol insurrectionists were carrying ham band enabled HTs

# JANUARY MEETING MINUTES
by Doug WW6D, Secretary

The monthly meeting was held on Zoom January 13, 2021. Social hour began at 6:30 pm, hosted by President Roger Cooper, N3RC. Formal meeting began promptly at 7:00 pm. 19 participants joined the meeting including 3 guests. This recorder noted one guest, Darv, KK6OVH.

A motion was made to approve the minutes and treasurer's report from the December meet-ing as published in the December Sunspots. Motion was seconded and approved.

Old Business. A few members inquired again about the potential of using PayPal for col-lecting dues. After a lively discussion, it was decided to have Jim K6JS and Len K6ANP investigate the matter and report back to the membership in the future.

New Business. Fred N6YEU followed up from last month's announcement of the 2020 REDXA Spirit Awardees Jim K6JS and Alan K6SRZ. He presented each recipient (over Zoom) a 'replica keyer' with their recognition noted on engraved brass. (The replica was mod-eled after a Begali signature paddle.) Fred has since followed up by hand delivering the awards to Jim and Alan. Congratulations to both.

Program: Sunspot Cycle 25 -- New Optimism by Carl Luetzelschwab, K9LA. As you all know, Carl K9LA is an authority ionospheric propagation as well as other forms that we encounter on LF, MF and above. The evening's program included new references that in-dicate a more optimistic view of Cycle 25. For further information, check out his web sites at: http://k9la.us .

Meeting adjourned at 8:12pm.

## REDXA Calendar of Upcoming Events

by Doug WW6D

*Feb 10 * REDXA Monthly Meeting*

**Feb 12-14 CQ WW WPX, RTTY**

| | | | |
|---|---|---|---|
| **Feb 20-21** | **ARR L** | **Inter. DX** | **Contest, CW** |
| **Feb 26-28** | **CQ 160m Contest, SSB** | | |
| **Fe b** | **27-2 8** | **North American** | **QSO Party, RTTY** |
| **Ma r** | **6-7** | **ARR L** | **Inter. DX** **Contest, SSB** |

*Mar 10 * REDXA Monthly Meeting*

**Mar 13-14 Stew Perry Topband Challenge**

**Mar 27-28 CQ WW WPX, SSB**

**Apr 10-11 Japan International DX Contest CW**

*Apr 14 * REDXA Monthly Meeting*

**Apr 16-18 Virtual International DX & Contesting Conv: Part 1**

**Apr 23-25 Virtual International DX & Contesting Conv: Part 2**

**(For more info, go to: http://www.dxconvention.com/ )**

Refer to https://www.contestcalendar.com/contestcal.html for more contest information.

January Treasurer's Report

Addendum

Beginning balance: 3585.89

Expenses:

| | |
|---|---|
| Postage: | <26.54 > |
| Spirit Award | <57.61> |
| Income: | |
| Dues | 20.00 |
| Balance | $3,521.74 |

Fred, N6YEU

Treasurer


Hand made by N6YEU! Your editor and Past President Jim, K6JS thank the members of REDXA for this honor (we were both Spirit Award winners) and the unique award shown here. Fred used a Begali key as his model. When your editor posted this same photo on Facebook, one of the “likes” assumed it was fully functional as a paddle!


**Boulevard Café & Grill**

1096 Petaluma Blvd. North, Petaluma, CA

The Café is open again for socially distanced inside and patio service. They're not able to host gatherings like our REDXA meetings, but I encourage you to stop in for breakfast or lunch. It's one way to thank Daniel and his staff for their support over the past years.



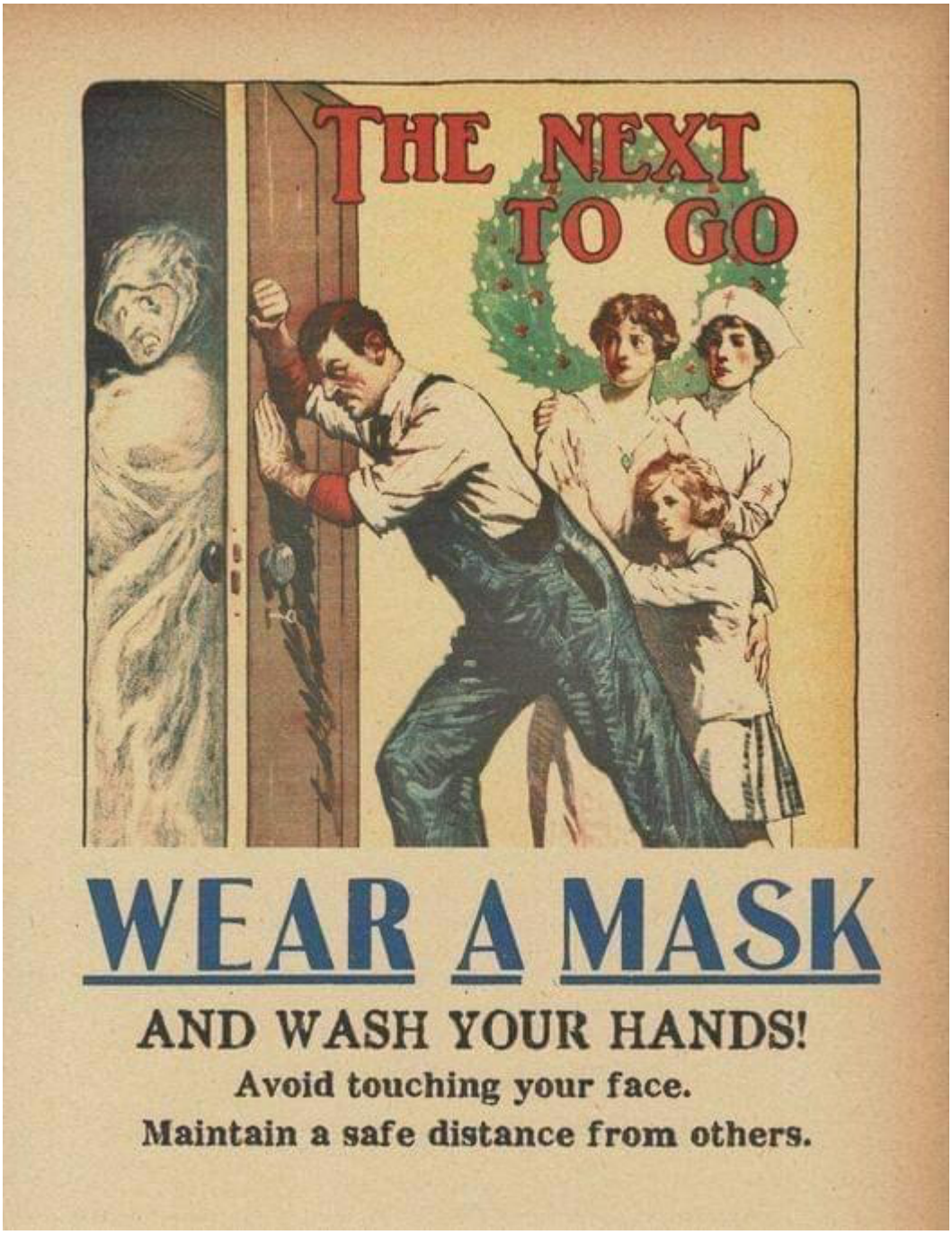
K6SRZ XYL Carol enjoying a chilly breakfast at the Café. Indoor REDXA meetings possible by Summer

# For sale

Yaesu FTdx  5000 $2500.00
Yaesu FT 1000 D $595.00
Yaesu sp 5 external speaker $25.00
Yaesu sp 5 with  fonepatch and meter $30.00
Yaesu FT 757GX  hf xcvr $395.00
Alpha 87A $2500.00
Spare set of finals for Alpha 3cx800A7  2 ea  Eimac  $950.00 ea
Top ten ant relays 6ea  $50.00
Top ten band decoder 2ea $95.00  ea
Signal link 4ea  $50.00 ea need cables  1 has cables $75.00
MFJ 259 B $100.00
Daiwa CN720B SWR power meter 2ea 1 has cracked glass in meter face $65.00 and $40.00 for the one with the cracked glass
Dentron MT 3000A antenna tuner $250.00
Icom IC4kl  KW solid state amp needs some work make offer
Mirage B2516 G 160 watt 2 meter amp $300.00
Mirage D 1010 100 watt 440 amp $300.00
Icom IC 820 144/440 dual band full duplex good for satellite work
$395.00 Alinco Battery EBP 73
B&W KW Dummy load Wattmeter dry with meter $50.00
Sinometer Frequency counter new $7.00
Tectronics oscilloscope make offer
Bird wattmeter 50 ohm  model 43 $100.00
Bird slugs 500 watt 2-30 khz  $ 35.00 ea
"  "  50  watt 2-30 khz
""  ""  10  watt 100-250  khz
""  ""  25  watt 100-250  khz
""  ""  25  watt  200-50  khz 2 ea
""  ""100 watt 200-500  khz
""  ""50  watt 100-250  khz
""  "" 50 watt 400-1000 khz
Grid dip meter unused
$50.00
Alinco DJ G7 triband Ht 144 450 1.2 with charger  $250.00

prices as marked but will take any reasonable offer.
Pickup only

Chuck  N6OJ
2 meters 146.490
707 774 - 6797
707 763 - 2528




From the influenza Pandemic 1917-19