

**TORC newsletter Fourth edition**



Photo by John Payton



Photo by Chris Seger

***MERRY CHRISTMAS***

***HAPPY NEW YEAR***

references

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**FROM ARRL**

**FROM OUR MEMBERS**

**FR4OM - Reunion Island**

**SpaceX Dragon capsule carrying four radio amateurs**

**It pays to advertise!**

**Lessons learned today during the outing**

**Arecibo radio telescope**

**PURPOSE**

**CLUB OFFICERS**

**President                    (K7AZT Paul Seger)**



**Vice President            (W8TK TOM Kravek)**



**Secretary                    (W7HD Ron Herring)**  
**& Newsletter Editor**



**Treasurer                    (AE9Q Dave Dostie)**



## GROUPS.IO

Scott K7ADX has set up a groups.io board for TORC.

They click the address [ToRC+subscribe@groups.io](mailto:ToRC+subscribe@groups.io) or copy and paste that address and send an email. They have to get an account – really simple. It only takes a minute.

Once they ask to join I will accept them and off we go.

Send members here: <https://groups.io/g/ToRC>

Once folks get in we can start communicating that way along with email, set up some topics where folks can interact, etc.

## TORTOLITA RADIO CLUB

*Serving the Greater Tucson Area*



**The ToRC website is up and running and can be viewed at**

**<https://tortolita-rc.com>.**

**It has the essentials on it for now. We can improve on it as things settle down.**

**When an email is sent to [contact@tortolita-rc.com](mailto:contact@tortolita-rc.com) I receive it and forward it on to the appropriate person.**

**Comments and suggestions are welcome.**

**73**

**Frank N1UW**

Many of you are familiar with our monthly **HF operating events**. We started on January 1, 2016 with the ARRL's wildly successful National Parks On The Air (NPOTA) and since then we have done about 50 outings around the state. Some of my favorites are Oracle and Picacho Peak State Parks, Chiricahua National Monument, Tombstone, Titan Missile Museum and many more that I can't remember. I use the mafia method of record keeping. I keep none.

Where would you like to go when the virus allows? We prefer venues less than 2 hours drive from Tucson. Parks are always good, especially if they have rest rooms (the YL's won't come otherwise), picnic ramadas, BBQ grill, at least one tall tree for antenna support, and AC power. None of those are deal breakers, however. We have batteries for power and Easy-up shelters for shade. Some of our venues require a fee to reserve a group area, usually in the range of \$30 and we will pass the hat to cover that. But many are free and since we have no dues or fees, that would be a plus.

These outings are great for newbies who want to learn how to operate, and they provide opportunity for testing antennas and radios on the air. Reply on the reflector with your ideas (mailto:[ToRC@groups.io](mailto:ToRC@groups.io) )

73 de W8TK Tom Kravec

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**From Nov 19, 2020 ARRL message about the FCC proposed "fees".**

**"Amateur radio's role in providing emergency and disaster communication, education, and other volunteer services also justifies exempting radio amateurs from FCC application fees. For example, ARRL noted, last year more than 31,000 participated as members of the ARRL Amateur Radio Emergency Service (ARES), and local ARES teams reported taking part in more than 37,000 events, donating nearly 573,000 volunteer hours, providing a total value of more than \$14.5 million."**

**That's JUST money! Who cares? The value of lives saved by Hams is incalculable!!!**  
**n7ghz**

## **Contest Calendar January 2021**

by Tom Kravec W8TK

Contest season is in full swing as much of the world is looking for something to do indoors. In addition, it looks like the next sunspot cycle is on the way up. SFI is frequently >80 and sunspots are visible most days now. I have worked stations in Africa and Asia at the same time of day on some afternoons. Have a listen!

Straight Key Night has been mentioned here in the past. As long as you remember Morse, this is a fun event. Speeds are slow as folks dust off their antique equipment, keys and bugs. Got some tube radios? You can find them on the air. Interesting ragchews too. Begins at 0000Z on January 1 and runs for 24 hours. Beats being on the road with DUI suspects.

ARRL RTTY Roundup is January 2-3. This is a popular event and a good opportunity to get your feet wet in RTTY. If you have a computer with sound card, you can do this. Find complete details on how at: <https://www.aa5au.com/rtty/> Exchange is RST & state for W/VE stations, RST & serial number for DX. Details: [www.arrl.org/rtty-roundup](http://www.arrl.org/rtty-roundup)

ARRL Kids' Day is also January 2. Not really a contest but a chance to show your kids, grandkids, local urchins what ham radio is all about. SSB preferred but VHF FM works too. My granddaughters ages 8 and 10 are enchanted with Morse because none of their friends know it. No log submissions. Exchange is cute: name + age + QTH + favorite color.

Details: [www.arrl.org/kids-day](http://www.arrl.org/kids-day)

Old New Year Contest is January 9, 0500-0900. SSB and CW modes. Another cute exchange: RST + sum of operator age and years on the air. Not one I have participated in but my exchange would be 5NN 136, so I might try it.

Details: <http://www.radio.ru/cq/contest/rules-results/index7.shtml>

North American QSO Party (SSB) January 16-17 is a busy one. You could easily work all states in a weekend. Exchange is name and state or province or country for NA stations, just name for other DX. Details: [www.ncjweb.com/NAQP-Rules.pdf](http://www.ncjweb.com/NAQP-Rules.pdf).

Keep the RF flowing

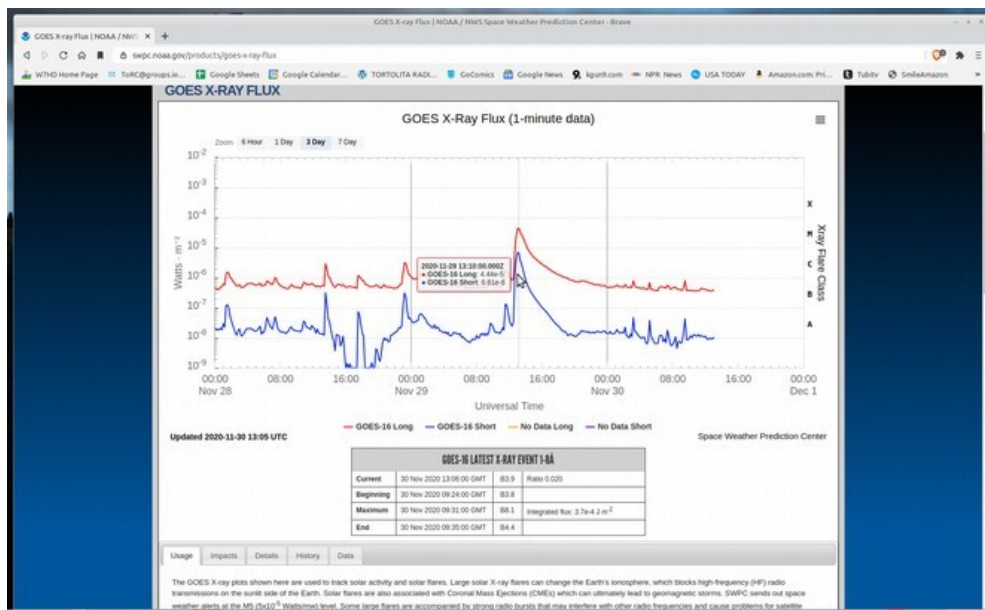
73 de W8TK



Sunday Nov 29<sup>th</sup>: M Class flare caused Radio Blackout over Atlantic Ocean.

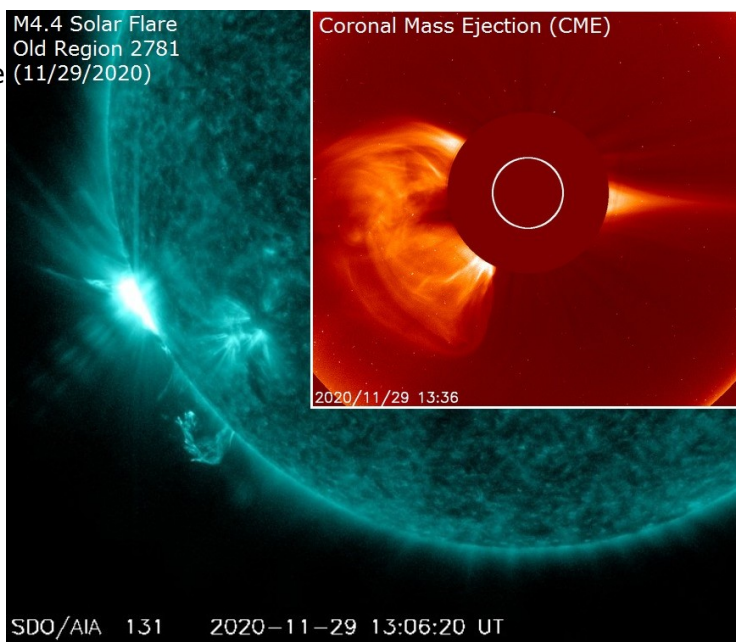
New Solar Cycle 25 continues its impressive sudden awakening. An M4.4 long duration event (LDE) was detected at 13:11 UTC (Nov 29) from just off the southeast limb and resulted in an impressive, fast moving coronal mass ejection (CME). A look at video courtesy of STEREO Ahead shows what appears to be a fairly minor initial flare, which then quickly escalated into a volatile magnetic eruption across the entire active region.

Because the event took place behind the limb, other than the initial radio blackout, should have little impact on our planet. The solar rotation will carry the source region, likely old AR 2781 into view during the next 24-48 hours.



**UPDATE:** NOAA Space Weather Prediction Center (SWPC) has updated their CME prediction model to include the eruption today off the southeast limb. When looking at coronagraph video further, the extreme edge of the plasma cloud could possibly deliver a weak glancing blow to our geomagnetic field by December 2nd. While geomagnetic storming is not currently expected, it is still something to keep an eye on in the days ahead.

WWV Data as of Tue Nov 24 19:40:01 MST 2020  
Solar flux 100 and estimated planetary A-index 4.



WWV Data as of Thu Nov 26 05:40:01 MST 2020  
Solar flux 104 and estimated planetary A-index 7.

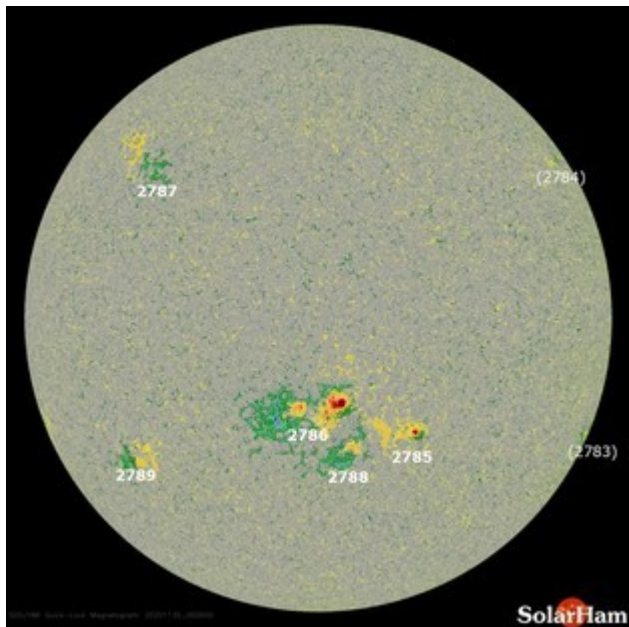
WWV Data as of Thu Nov 26 15:10:02 MST 2020  
Solar flux 106 and estimated planetary A-index 8.

WWV Data as of Sat Nov 28 14:10:02 MST 2020  
Solar flux 110 and estimated planetary A-index 10.

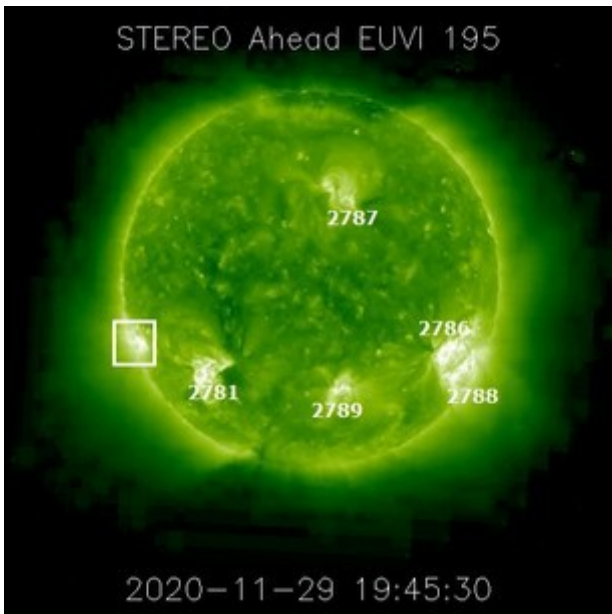
WWV Data as of Sun Nov 29 14:20:01 MST 2020  
  
Solar flux 116 and estimated planetary A-index 6.

WWV Data as of Tue Dec 1 08:10:01 MST 2020  
  
Solar flux 109 and estimated planetary A-index 8.

GOES-16 LATEST X-RAY EVENT 1-8Å			
Current	29 Nov 2020 21:22:00 GMT	B7.4	Ratio 0.021
Beginning	29 Nov 2020 12:34:00 GMT	B7.7	
Maximum	29 Nov 2020 13:11:00 GMT	M4.4	Integrated flux: 9.4e-2 J m-2
End	29 Nov 2020 13:41:00 GMT	M2.1	



5 active regions visible



farside of sun



## TIPS, TRICKS, AND LINKS

### [How to Force Users to Change Their Passwords on Linux](#)

- Passwords are the keystone to account security. We'll show you how to reset passwords, set password expiration periods, and enforce password changes on your Linux network.

### [Let's Appreciate the Mechanical Marvel of Pinball, Courtesy of 'The Slow Mo Guys'](#)

- Pinball machines are a feat of engineering wizardry, with hundreds of parts that loudly slam together to keep the entertainment going. But don't take my word for it—The Slow Mo Guys' newest video takes us under the glass to see how a pinball machine works in stunning slow motion. **BEWARE** – you may find this addictive :-)

### [How I changed the way I charge my iPhone and Android phones to reduce battery wear](#)

### [Raspberry Pi 400: Its designer reveals more about the faster Pi 4 in the \\$70 PC's keyboard](#)

### [Quantum computers are coming. Get ready for them to change everything](#)

- Quantum computers are not yet creating business value, but CIOs should nonetheless lose no time in getting involved.

### [AutoKey: How to Replace Characters with Predefined Text Automatically in Linux](#)

- Welcome to AutoKey, the free desktop automation utility for Linux. Do you often use templates, repeat keystrokes or other repetitive tasks? If so, AutoKey is a great toolkit you do not want to miss out on!

### [How to See Which Processes Are Stopping a Mac from Sleeping](#)

- Trying to get a Mac to automatically sleep after a certain period of time can be frustrating. Several things can interrupt the process, including network activity and stubborn apps. Luckily, you can use a handy tab in Activity Monitor to quickly diagnose what might be preventing your Mac from sleeping. Here's how.

### [How to view your SSH keys in Linux, macOS, and Windows](#)

- If you're not sure how to view your SSH certificates, Jack Wallen walks you through the steps on Linux, macOS, and Windows.

### [Best Linux desktop distributions of 2020](#)

- Jack Wallen lays out his favorite Linux desktop distributions for 2020. Is yours on the list?

### [How to Find and Delete Broken Symlinks on Linux](#)

- The symbolic links on Linux are a fantastic feature, but they can become broken and left pointing at nothing. Here's how to locate broken symbolic links, review them, and remove them from your system if you need to.

### **New solar panel design increases efficiency by 125%**

- Designing solar panels in checkerboard lines increases their ability to absorb light by 125 per cent, a new study says. Researchers say the breakthrough could lead to the production of thinner, lighter and more flexible solar panels that could be used to power more homes and be used in a wider range of products.

### **How to Generate a URL QR Code in Google Chrome on Android**

- There are plenty of ways to share links from Google Chrome on Android. You can copy a URL or share it directly with another app. But it's always good to have more options, and one such option is QR codes.

### **What Is Apple's M1 Chip for the Mac?**

- In June 2020, Apple announced its intention to move away from Intel for the Mac lineup. The M1 is the first ARM-based custom system-on-chip (SoC) designed from the ground up by Apple. Here's what you need to know about Apple's custom silicon.

### **How to Forward an Email as an Attachment in Gmail**

- Instead of forwarding several emails individually, you can send them all at once as attachments. With Gmail, you don't even have to [save the emails to your computer](#) to do it-there's a built-in option just for you.

### **How to Recover Deleted Files on Linux with testdisk**

- Have you ever deleted a file and instantly regretted it? You need it back, and fast! But what if the file is so new, it hasn't yet been backed up? Fortunately, there's something you can do about it.

### **How to Kill Zombie Processes on Linux**

- Programs that are poorly written or performing badly can leave zombie processes lurking inside your Linux computer. Find out how zombies are created, and how you can finally lay them to rest.

### **Hackaday: Ham Radio Needs To Embrace The Hacker Community Now More Than Ever.**

- Thanks to Bob Barth W7GBB, a great article.

Create udev rules for ttyUSB devices

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## 1 Create udev rules for ttyUSB devices

The Linux kernel does not always enumerate USB devices in the same order. This makes knowing what is attached to the other end of a ttyUSB UART like playing roulette. Here's how to make a named alias that lets you know what is attached to the UART. This relies on the USB device having unique serial numbers or strings. Knockoff brands of cables, or cheap cables may not permit the use of this technique. It is best to spend a little more for well behaved USB cables. It also best to order them from a reputable source.

### 1.1 Get the properties from the USB device

```
udevadm info --query=all --name=/dev/ttyUSB1
```

```
P: /devices/pci0000:00/0000:00:14.0/usb1/1-2/1-2:1.0/ttyUSB1/tty/ttyUSB1
N: ttyUSB1
S: serial/by-id/usb-FTDI_FT232R_USB_UART_AL02A2I5-if00-port0
S: serial/by-path/pci-0000:00:14.0-usb-0:2:1.0-port0
E: DEVLINKS=/dev/serial/by-id/usb-FTDI_FT232R_USB_UART_AL02A2I5-if00-port0
/dev/serial/by-path/pci-0000:00:14.0-usb-0:2:1.0-port0
E: DEVNAME=/dev/ttyUSB1
E: DEVPATH=/devices/pci0000:00/0000:00:14.0/usb1/1-2/1-2:1.0/ttyUSB1/tty/ttyUSB1
E: ID_BUS=usb
E: ID_MM_CANDIDATE=1
E: ID_MODEL=FT232R_USB_UART
E: ID_MODEL_ENC=FT232R\x20USB\x20UART
E: ID_MODEL_FROM_DATABASE=FT232 Serial (UART) IC
E: ID_MODEL_ID=6001
E: ID_PATH=pci-0000:00:14.0-usb-0:2:1.0
E: ID_PATH_TAG=pci-0000_00_14_0-usb-0_2_1_0
E: ID_PCI_CLASS_FROM_DATABASE=Serial bus controller
E: ID_PCI_INTERFACE_FROM_DATABASE=XHCI
E: ID_PCI_SUBCLASS_FROM_DATABASE=USB controller
E: ID_REVISION=0600
```

```
E: ID_SERIAL=FTDI_FT232R_USB_UART_AL02A2I5
E: ID_SERIAL_SHORT=AL02A2I5
E: ID_TYPE=generic
E: ID_USB_DRIVER=ftdi_sio
E: ID_USB_INTERFACES=:ffffff:
E: ID_USB_INTERFACE_NUM=00
E: ID_VENDOR=FTDI
E: ID_VENDOR_ENC=FTDI
E: ID_VENDOR_FROM_DATABASE=Future Technology Devices International, Ltd
E: ID_VENDOR_ID=0403
E: MAJOR=188
E: MINOR=1
E: SUBSYSTEM=tty
E: TAGS=:systemd:
E: USEC_INITIALIZED=29075257
```

## 1.2 Get the unique identifier

The udevadm results above are for a well behaved FTDI USB UART. This allows a unique identifier to be isolated:

```
E: ID_SERIAL=FTDI_FT232R_USB_UART_AL02A2I5
E: ID_SERIAL_SHORT=AL02A2I5
```

## 1.3 Create a new udev rule

Using the unique identifier, create or update an existing udev rule. The leading numeric values signal the load order to the kernel.

```
cd /etc/udev/rules.d
ls
```

```
| 70-persistent-usb.rules |
```

### 1.3.1 Choose 70-persistent-usb.rules

Edit the rules file and add rules for your device

```
# Make the kernel set the permissions to 664 for pluggable devices
KERNEL=="ttyUSB[0-9]*", NAME="tts/%n", GROUP="dialout", MODE="0664"

# Create some aliases. This shows how to use a well behaved, and a poorly behaved
# device to add nodes. FTDI provides unique SERIAL number strings, which is really
# nice. Prolific, by comparison, behaves poorly.
SUBSYSTEM=="tty", ENV{ID_SERIAL}=="FTDI_FT232R_USB_UART_AL02A2I5", SYMLINK+="tnc1"
SUBSYSTEM=="tty", ENV{ID_SERIAL}=="Prolific_Technology_Inc._USB-Serial_Controller",
SYMLINK+="linuxconsole"
SUBSYSTEM=="tty", ENV{ID_SERIAL}=="067b_2303", SYMLINK+="kvm0000-serial"
```

## 1.4 Restart the udev daemon

When your changes are complete you need to restart the udev daemon. I use:

```
sudo systemctl restart systemd-udev
```

## 1.5 Check the results

You should now have symbolic links between a constant name and the USB device that will enumerate with different device names. The link is owned by *root*, which is expected. The actual device will be in the *dialout* group.

```
ls -la /dev/linuxconsole
```

```
: lrwxrwxrwx. 1 root root 7 Sep  9 07:37 /dev/linuxconsole -> ttyUSB1
```

Author: Johnathan Mantey

Created: 2020-11-10 Tue 16:47

## FROM ARRL

**Neutron-1 CubeSat Deployed from ISS; Other Sats Pending**

The [Neutron-1 3U CubeSat](#) was deployed from the International Space Station (ISS) on November 5 at 10:40 UTC. For the satellite's first month and during its commissioning phase, the Neutron-1 beacon will transmit 1,200 bps BPSK [telemetry](#) every 60 seconds on 435.300 MHz. Developed by



the Hawaii Space Flight Laboratory (HSFL) at the University of Hawaii at Manoa (UHM), the satellite's payload includes a VU FM amateur radio repeater during available times and according to the spacecraft's power budget. The Neutron-1 science mission is spelled out in a [formal paper](#), *Neutron-1 Mission: Low Earth Orbit Neutron Flux Detection and COSMOS Mission Operations Technology Demonstration*.

HSFL operates and maintains a satellite UHF, VHF, and L/S-band amateur radio ground station at Kauai Community College.

The primary mission of Neutron-1 is to measure low-energy neutron flux in low-Earth orbit (LEO). The science payload, a small neutron detector developed by Arizona State University, will focus on measurements of low-energy secondary neutrons -- a component of the LEO neutron environment.

A number of other amateur radio satellites are expected to launch or be deployed in the next few months. AMSAT's RadFxSat-2 (Fox-1E) is expected to go into orbit by year's end on Virgin Orbit's LauncherOne vehicle. RadFxSat-2 carries a 30 kHz wide VU linear transponder.

The Tevel Mission -- a series of eight Israeli 1U CubeSats, each carrying a UV FM transponder -- is expected to launch from India on a SpaceX Falcon 9 rocket in December. Also from the Herzliya Science Center is a 3U CubeSat called Tausat-1, which is scheduled to launch on a Japan Aerospace Exploration Agency (JAXA) ISS resupply mission in February for subsequent deployment. Tausat-1 carries an FM transponder.

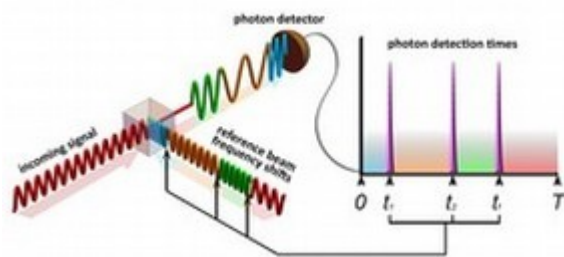
AMSAT-Spain ([AMSAT-EA](#)) reports that its PocketQubes, EASAT-2 and HADES, have been integrated for launch on a SpaceX Falcon 9 in December, while GENESIS-L and GENESIS-N have been integrated for launch on Firefly's Alpha rocket. Read [more](#). -- Thanks to AMSAT News Service





## New NIST System Detects Ultra-Faint Signals Using Quantum Physics Principles

Researchers at the National Institute of Standards and Technology ([NIST](#)) have devised and demonstrated a system that could dramatically increase the performance of communication networks while enabling record-low error rates in detecting even the faintest of signals. This has the potential to cut the total amount of energy required for state-of-the-art networks by a factor of 10 to 100. The proof-of-principle system consists of a novel receiver and corresponding signal-processing technique, entirely based on the



**The incoming signal (red, lower left) proceeds through a beam splitter to the photon detector, which has an attached time register (top right). The receiver sends the reference beam to the beam splitter to cancel the incoming pulse, so that no light is detected. The receiver uses exact times of photon detection. The combination of recorded detection times and the history of reference beam frequencies is used to find the frequency of the incoming signal.**

properties of quantum physics and able to handle extremely weak signals with pulses that carry many bits of data.

"We built the communication test bed using off-the-shelf components to demonstrate that quantum-measurement-enabled communication can potentially be scaled up for widespread commercial use," said Ivan Burenkov, a physicist at the [Joint Quantum Institute](#), a research partnership between NIST and the University of Maryland. Burenkov and his colleagues reported the results in [Physical Review X Quantum](#).

"Our effort shows that quantum measurements offer valuable, heretofore unforeseen advantages for telecommunications leading to revolutionary improvements in channel bandwidth and energy efficiency," Burenkov added.

Modern communications systems work by converting information into a laser-generated stream of digital light pulses in which information is encoded -- in the form of changes to the properties of the light waves -- for transfer and then decoded when it reaches the receiver.

The train of pulses grows fainter as it travels along transmission channels, and conventional electronic technology for receiving and decoding data has reached the limit of its ability to precisely detect the information in such attenuated signals.

The signal pulse can dwindle until it is as weak as a few photons -- or even less than one on average. At that point, inevitable random quantum fluctuations, called "shot noise," make accurate reception impossible by normal ("classical," as opposed to quantum) technology because the uncertainty caused by the noise makes up such a large part of the diminished signal. As a result, existing systems must amplify the signals repeatedly along the transmission line, at considerable energy cost, keeping them strong enough to detect reliably.

The NIST team's system can eliminate the need for amplifiers because it can reliably process even extremely feeble signal pulses: "The total energy required to transmit one bit becomes a fundamental factor hindering the development of networks," said Sergey Polyakov, senior scientist on the NIST team. "The goal is to reduce the sum of energy required by lasers, amplifiers, detectors, and support equipment to reliably transmit information over longer distances."

## FROM OUR MEMBERS

I have a box full of power supplies which convert 12-14 vdc to 19.1 vdc, which is the voltage most laptops require. They all produce S9 level RF noise so we have given up using them on our outings. I use cheap old laptops, available for about \$100, and their batteries are not great so it would be nice if I had a DC-DC supply to run the laptop from the same DC supply as the radio without wiping out the receiver with noise.

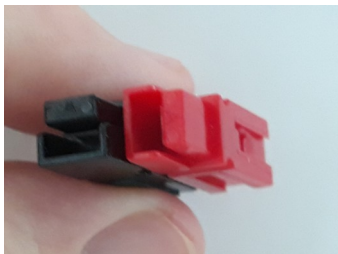


Well, now I do. Amazon sells one for \$20 and I detect no RF noise from the booster:

[https://www.amazon.com/dp/B01H97ETP8?psc=1&ref=ppx\\_pop\\_dt\\_b\\_product\\_details](https://www.amazon.com/dp/B01H97ETP8?psc=1&ref=ppx_pop_dt_b_product_details)

Yellow and one black wire go to 12 volt battery, red and other black to laptop. They are labeled. As for PowerPoles, they can be assembled so you can't make a mistake. Instead of red next to black, attach red ABOVE black. They will not mate with the usual arrangement and that's what I use for the 19 volt pair.

73 de W8TK  
Tom Kravec



Normal orientation for 12-14 vdc

Alternate T arrangement

Photos thanks to N7GHZ

Tom - That is a great idea on changing the arrangement of the powerpoles for 19v. I have a QRP Labs 50w amp that needs 20v. I use a small buck converter but have the regular powerpole arrangement and have been concerned that one time of not paying attention could fry something.

Dave, AE9Q

For our setup at the RAMROD race we use multiple colors of Anderson PowerPoles. We use a different color for each voltage, i.e. 24V, 6V, and 12V. Unless you are colorblind, it works great and is easy to setup at 5:00am.

Bob AF9W

What is the opinion of the group of using short 2-3 inch, "pigtail" ground wires attached to the radio chassis... and using a Green powerpole as a quick disconnect; mated with another powerpole/wire that attaches to the common station ground?

To me, this seems like it could also be useful in the field...

Has/does anyone done this? If so, how successfully?

John n7ghz

We are talking about a part of the safety grounding system. Every publication I have ever read says the ground wire to a ground rod must be a continuous heavy wire. Seems to me the heavy wire requirement means that when needed the wire better be ready to carry a lot of current however short a time. In that situation a power pole sounds more like a fuse which would probably blow. I vote no. Now, if I am correct, then I wonder why modern radio gear provide a tiny grounding point with a tiny screw and washer. Perhaps I am missing something? Even my Ameritron rf amp has a tiny grounding screw. Good luck attaching a heavy wire to that!

Richard k7nsw

I think you are misreading the requirement. Only the ground rod needs the heavy wire to a common ground point. The rest can be smaller wires capable of carrying the largest amount of current you can manage. I typically use #12 wire for grounds.

And don't forget that the length of the wire is critical if you are talking higher frequencies. On 10M, 8' of wire is a 1/4 wavelength. The ground wire is really for lower frequencies (less than 10Khz) only and static discharges. It still won't help with a direct lightning strike. I do think the green powerpole ground connection is a good idea.

Ron W7HD

OK - all good comments. So I want to share some specifics with you and am interested in your thoughts.

1 - I am like many of you - across the back of my operating table I have a length of 3/4 inch copper pipe. That is my ground buss providing a common point of ground for each piece of my gear. A heavy bare solid copper wire - number 10 bare copper - is attached to one end of that pipe with a stainless steel hose clamp and out the window the wire goes straight down to a ground rod. The wire is clamped to that rod and continues on as a continuous length of wire to a second rod 8 feet away - clamped to the second rod - and continues an additional 7 feet to the house ground rod. Two problems solved. First, I have a great safety ground for my equipment: the green wire system along with my three ground rod system. Second, the attachment to the house rod eliminates a parallel ground system and thus no ground loop to generate noise.

2 - on my operating table each unit of radio gear is attached to the copper pipe buss via as short a wire as possible. What is that short wire? What is the purpose of it? Well, it better be a stout wire if the purpose of it is to guaranty that a fuse or circuit breaker will be pulled down by the ground system if a default occurs. So I have to figure out how to attach a stout wire to those tiny ground

screws I have on my gear. On the other hand, if the purpose of those wires is to simply act as a drain, then forget the heavy wire, rely on the green wire in the power cords in my gear, and use a short length of door bell wire from my radios to my ground buss pipe. Door bell wire fits beautifully under those tiny screw heads.

Well, my gut tells me to forget the door bell wire. So I use short lengths of RG-8 size coax braid. On one end I flatten the braid and use an awl to open a hole just big enough to go over the tiny ground lug screw. Then I tin it with solder to keep the hole from getting bigger. Under the tiny screw head it goes and I am in business with a heavy wire firmly attached. The other end is clamped to my copper pipe/ground buss.

So here is the problem. Articles written by credible authors say using coax shield for a ground wire is a bad idea because each of the tiny individual wires composing the braid will oxidize over time and fail to contact the other tiny braid wires. Thus the ground wire fails. So I am faced with a fail/fail situation. I fail if I cannot get a heavy solid wire attached to each of the tiny screw heads. I fail if I use coax shield.

Two questions for you. First, do you agree with the proposition that using coax braid is a bad idea? Second, if we are talking about those equipment ground wires being merely "a drain", then bell wire is the answer. So what is that drain? What are they draining? I have never heard that question answered.

How about this? You have seen those pictures of a commonly used system to ground antenna towers. Perhaps you use it with your tower. At the tower base just before each tower leg disappears into the concrete a heavy BRAID is attached to each leg and runs a very short distance to a ground rod - three tower legs, three ground rods. Why is using a braid there valid but not in my shack attaching my radios to my ground buss? Is it because the tower braid wires are all plated/galvanized and will not oxidize in the weather? Are they immune to the impact of the weather through the years?

One last question, then I will stop. "Back in the day" when our transmitters had tubes with a plate tank circuit we used them to drive an rf amplifier which also had a plate tank circuit. We were told it was mandatory to have a heavy ground wire connecting our transmitter directly to the amplifier because heavy currents were flowing between the two tank circuits. We could not rely upon the coax shield running between them. Well, today I have a tube rf amplifier with a plate tank circuit. But my new age transmitter is solid state - no tubes and no plate tank circuit. Even so, are there still heavy currents flowing between my solid state transmitter output stage and my tube rf amplifier plate tank circuit? Or is a heavy wire no longer need but the practice has carried over even though no longer necessary?

Please do not comment saying all of this is useless in the event of a direct or very close lightening strike. We all know there is no way to survive that unless EVERYTHING is disconnected when you shut down your radios - even every 120vac line you use. I am not talking about that issue. So, what say you? I regret this is so long. But it took this much to get these questions out of my head.

Ward Silver's N0AX book on Grounding and Bonding is published by the ARRL and provides answers to all of the questions posted. He regularly gives presentations on the subject and it is well worth watching.

Agree with Ron W7HD that every quarter wave you will have an "open" ground at RF. Also Gene points out Ward's suggestions of making the lightning go around the house and equipment rather than through it.

As for the "drai" comment .... there is a lot of literature with misleading theories .... I will not take the time to refute them her .... just read the book, it explains it all very eloquently and is well worth the couple of bucks ARRL charges for it.

73, George NG7A

I went big on lightning protection. My tower is connected to fifty 8ft. copper ground rods thermite welded to 500 ft of 2 inch copper strap, all bonded to 6 inch copper strap from the copper Polyphaser entry panel and to the casita Ufer ground. In addition, every line coming in or going out has Polyphaser arrestors inline, including the rotator cable. And the AC panel, which supplies the hamshack only, has a giant Polyphaser arrestor. If I have been hit by lightning in the past 17 years, I don't know about it. No damage so far.

W8TK

I have a polyphaser strike counter on my 100Ft tower (on 90 Ft hill) which shows 105 counts in the last 17 years. It counts about 5-7 times for each direct strike because the charge goes back and forth untill it decays. It doesn't seem to count at all for near strikes which have produced the only damage I've had which has been minor. The minor damage was caused by arrestors that were gas tube only and did not incorporate an L/C network. I've been blown out of bed by direct strikes and the ends of my 80 M beam are charred. I leave 6 radios on 24/7/365.

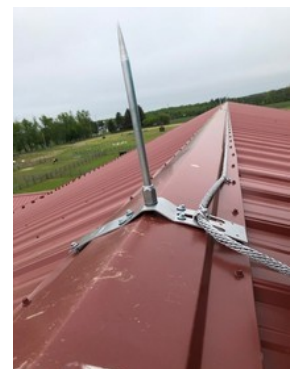
Extensive grounds at each tower (3) to shunt the majority of the charge there and a Ufer ground with ring ground around the house. All lines, rotor, relays, coax, power, etc have arrestors at single point entry.

AB7AA

Hi Bill,

With having charred ends on your 80m beam & that many apparent strikes...

Have you considered installing silicon caps on the element tips? Lightning likes to seek out "points/sharp edges"; i.e. that is why lightning rods usually have pointed tips! (As seen here)



73 - John - N7GHZ

I'm aware of this and that is why I'll keep it just as it is. I want it to strike there as opposed to elsewhere. It's setup to take it there.

AB7AA

I have a 50 ft tower that I installed in 1980. When I dug the hole for the base, I put in 3 8' ground rods tied to the tower legs with 1" braid. I haven't yet seen a lightning strike at my location, although there have been several about 1000 ft away. I live in the so-called "zone of protection" from a mountain 1 mile east of me. I do need to insert bleeder resistors on my dipoles, since wind and blowing dust generate massive amounts of static electricity. Many times before doing this I watched the coax ends arcing. I then placed NE-2 bulbs across the connectors to dissipate the static. Finally, I resorted to bleeder resistors (110K 2W) directly on the dipole center conductor, which alleviated the static.

Ron W7HD

Curiously,

Having worked on 3 different Aircraft Carriers, and seeing all of the arrestors & such... and with all of that floating steel, planes, equipment, etc., I never once saw or heard of lightning hitting - well, anything on the ships - - - and we went through several very wicked lightning storms!

What I really found odd about that, was with our huge profile above the water with no strikes, and yet, I also saw 3 planes hit by lightning mere moments after we launched them! One had to immediately dump fuel & live ordinance & make an emergency barrier trap landing. That strike blew the refueling probe clean off of plane, started a fire & cracked the right side wind screen. That was a scary 8 minutes for everyone! Especially the 3 minutes after it landed of trying get the fire put out!!!

73 - John - N7GHZ

You are forgetting that all those arrestors and such were actually bleeding off the static charge. That was why we had them on radar towers and antennas, which are usually on the highest point of the highest hill/mountain around - to **prevent** strikes. Thus the lightning had to hit something NOT attached to the ship.

Ron W7HD

Great points Ron.                      73 - John - N7GHZ

OH MY! I am glad I opened this topic on grounding. I have learned a great deal. The photographs and stories told are great. Yes, I have Ward Silver's book on grounding. A very good read. Thanks for the link to his video presentation - not aware of that. Looks like Tortolito ARC is the club I have been looking for. I hope this spirit of sharing continues on whatever topic arises. Thanks for being contributors instead of merely consumers. Paying forward really works. Reading a book is good. Hearing from actively engaged hams where I live is better.

You will probably find that the odd form factor of the 705 doesn't work very well. You can have the radio on its back so the display faces the ceiling or you can have it on the bottom so display faces your umbilicus. I found a cheap and easy solution. There are 4 holes on the bottom so you can secure the radio to a mount. The screw holes are tapped to accommodate a metric M4 thread. I



bought two M4 screws, about 2" long and now I can position the radio so it's looking right at me. Photos attached.

Tom W8TK



**1st FT8 10M contact was 1645 miles on 3 watts from my IC-705 to my new AL-705 loop set up in the living room. Color me impressed. And this is in the minimum solar cycle!**

-- Ron W7HD

## Hello Group!

Quick dipole question.

I am building an inverted v for 40 meters to take on vacation to Alpine in two weeks.

Aside from the usual generic dimensions for a horizontal dipole, have any of you confirmed that the dimensions for the V antenna are longer or shorter?

I ask this because I have found a few references on the internet net stating that the V dimensions are slightly different.

Thanks for the indulgence on this simple concept question.

Bob KA7VPR

Regarding the length - I believe the length is slightly shorter than a standard dipole, depending on how close to horizontal it is when erected. If it has a steep angle, the length will be shorter (perhaps 5%), if it's closer to horizontal, the length will be only slightly shorter (perhaps 2 or 3%). As with most homebrews, the best thing is probably to make it slightly long and then set it up and trim down gradually.

Regarding the specific angle - the general rule of thumb with an inverted vee is to try to make the angle between the legs at least 90 degrees. However what is best is really dependent on your situation and objectives. At wide angles (closer to horizontal), the antenna will likely be more directional broadside to the antenna. At narrower angles, you're approaching a vertical and it will probably perform more omnidirectionally.

An important factor is also how high the ends of the dipole legs are from the ground. I prefer at least 6' when possible.

I use an inverted vee on most of my SOTA activations and I think they are great antennas. With a tuner it can easily perform on multiple bands. I've set it up under so many different scenarios, from very wide angles on broad summits with trees, to very narrow angles on sharp rocky summits, sometimes it's been 30 feet high and others it's 5 feet at the center and half the legs laying on the ground, and it has always performed well no matter what.

Good Luck and I'd enjoy hearing about your results.

73, Keith Schlottman KR7RK

The angle also effects the feedpoint impedance. A horizontal dipole at 1/2 wavelength height has a feedpoint impedance of 75 ohms. At an angle of 90 degrees the impedance is closer to 50 ohms.

Bob AF9W

Have you had any experience with the same "V" dipole but mounted as a sloper? Reason being that I am going to try mounting the same "V" from the eaves of my two story home, and have the ends slope downward, ending up at about 6ft above the ground. This would slope the "V" antenna at about 60 degrees with respect to the ground I guess. I'm trying this because I may soon be getting friction from my HOA about the rotatable triband dipole I have had up for 12 years. I'm looking for stealth alternatives.

Let me know your thoughts if any.

Thanks!

73' Bob KA7VPR

Just about anything will work. For all the time we lived in Saddlebrooke I used a random wire end fed using a 9:1 balun. The balun was mounted 19' at the peak of my house and ran 53' back to 3' off the ground facing east. The 50' coax worked as the counterpoise. I tuned the antenna with the internal tuner in my KX3/KXPA100 but you don't need a super tuner to make the antenna work. In 5 years from 2012 to 2017 I made 205 DX QSO's (not separate countries just Q's outside of the US). It also worked all over AZ for the AZ Traffic and Emergency Net. The antenna used #26 antenna wire from The Wireman and was invisible except when the hummingbird perched on it. Keep the antenna away from your gutters if you have them, the first antenna I put up at Saddlebrooke was too close to the gutters and would not tune for beans.

Bob AF9W

This next weekend - Sat. Dec. 5 & Sun. Dec. 6 - will be the FT ROUNDUP - this contest setup specifically for FT8 & FT4 modes.

The folks who set up this contest have went above & beyond by providing very good setup & preparation guides to explain in detail how to setup your computer, how, to run the contest mode & how to finalize your log & sent it in.

By the way - in the final log instructions, they say that entering the club is not needed as they are not really running that portion this year, but I think it would be a great idea to still input - "Tortolita Radio Club" just so that we can show our support of the club and get our name out there.

All of the specifics are here: <https://www.rttycontesting.com/ft-roundup/preparation/>

Enjoy these instructions, and the contest!

Hope to see you on the air.

73 - John - N7GHZ

Hey folks,

FYI, I just completed an awesome FT8 contact on 40 Meters. FR4OM - Reunion Island

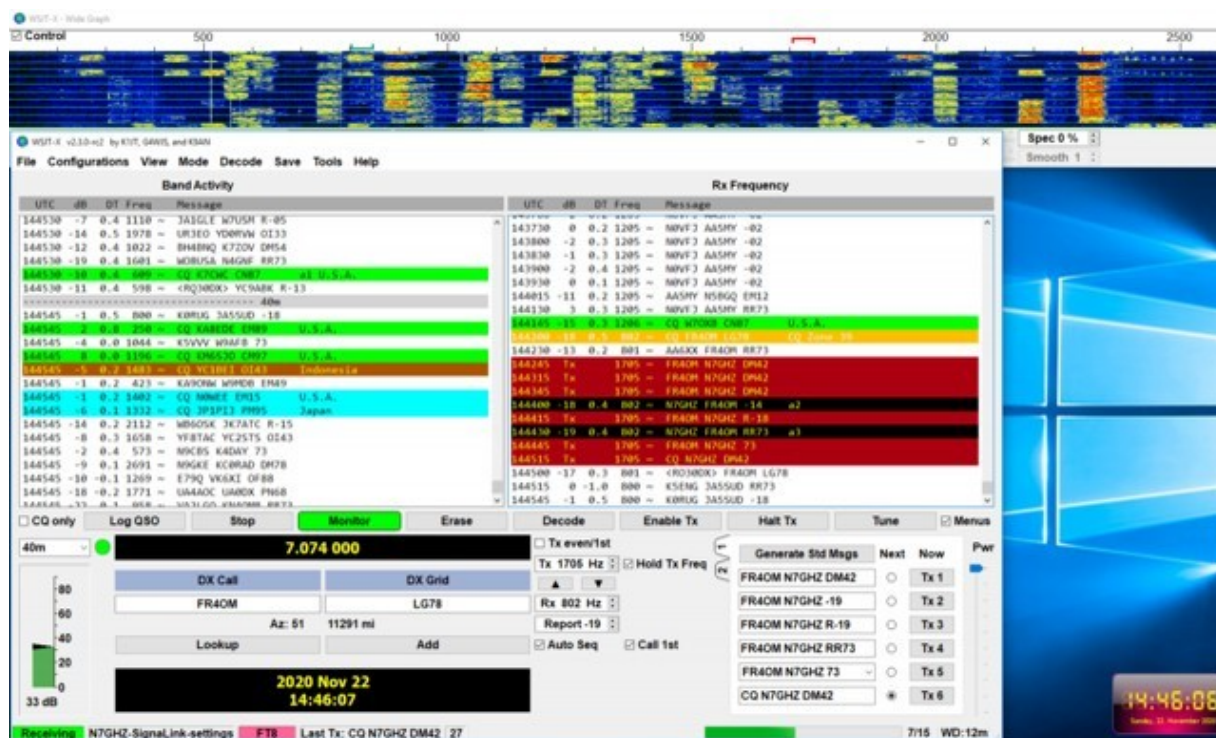
Yay! Woo-Hoo!!!!

I am very excited about this QSO, as it represents for me (or for us here in the Tucson area), the furthest I can transmit on Earth, from land-point to land-point!

Would have to find someone on a ship in the Indian Ocean to get any more distance. 11,922 miles according to QRZ.com. Also a new CQ Zone for me, Zone 39.

Not bad for a 36 year old Kenwood & a modest Off-Center-Fed-Dipole antenna! - Thanks Gary - KT7AZ for his design & build on the antenna.

John N7GHZ



19-Nov-2020

A SpaceX Dragon capsule carrying four radio amateurs autonomously docked with the I.S.S.

"Well, the ISS is loaded with hams now," Amateur Radio on the International Space Station (ARISS) US Delegate for ARRL Rosalie White, K1STO, said on Tuesday. "These four arrived very early this morning Eastern Time: NASA astronauts Victor Glover, KI5BKC; Mike Hopkins, KF5LJG, and Shannon Walker, KD5DXB, as well as Japan Aerospace Exploration Agency (JAXA) astronaut Soichi Noguchi, KD5TVP."

tnx to n7ghz



**From left to right: Shannon Walker, KD5DXB; Victor Glover, KI5BKC; Mike Hopkins, KF5LJG, and Soichi Noguchi, KD5TVP.**

### It pays to advertise!

That's an old slogan among businessmen, but it works for ham outings too. Unless you are planning your outings to correspond to contest dates, you may be lonely on the airwaves unless you tell folks where, why, and when you will be operating. Today I posted an upcoming outing (just 2 of us) on eham.net, qrz.com, and Parks on the Air websites. Here's how:

Eham.net From the home page, go to Community>Forums>Special Event Stations. Scroll down to the bottom of the page and click on New Topic. Post your info there, including what your event is, date, times, frequencies and modes, QSL information. Eham actually keeps track of how many views your message gets. You might have to register to post.

QRZ.com From the home page, go to News>Special Events, Contests, etc. At the bottom of that page, click Post New Thread and provide the same information as for eham. QRZ.com will also keep track of how many hits your post gets. I posted a few hours ago and already have 27 views. Again, you might have to register to post.

POTA (Parks on the Air) website is parksontheair.com. Only specific parks are included, and from the home page you can click on Maps and find what's nearby. You must register (it's free) to post your park activation and there is comprehensive information on how to get started, how to post your announcement, how to upload your logs. There are lots of statistics and awards in case you're interested in that.

During NPOTA and afterward we found that lots of hams look for special events, summits, and parks, and advertising your activities will insure lots of contacts. Offering certificates is even better but it's a lot of work. Hard to think about since Logbook of the World is so easy!

And you should obviously post your info right here on the ToRC groups.io page so your fellow club members can find you.

73 de W8TK  
Tom Kravec



**Sent:** Saturday, November 14, 2020 2:12:57 PM

**To:** ToRC@groups.io <ToRC@groups.io>

**Subject:** [ToRc] Lessons learned today

1. Social distancing doesn't have to shut down outings. K7AZT and I went to a park this morning, brought our own table, chairs, Easy-up shelter. We tossed his home-brew end fed half wave antenna up into a tree, powered the TS590 from a lead acid battery, used a laptop for logging. We made 150 CW contacts in 4 hours, including 2 in Alaska and one in France.

2. A good outing is a busy outing. We posted our outing in advance on Parks on the Air website as well as QRZ.com and eham.net. We had non-stop action all morning. Back in the day but after NPOTA we had some events in which we made only a dozen QSOs all day. Not nearly as much fun.

3. Lots of folks participate in Parks on the Air. It's worth the hassle of getting registered and uploading logs.

4. This reflector is a good way to announce your outing and solicit a partner if you desire. Two is not a crowd.

73 de W8TK

Tom Kravec

QRZ: POTA K-4571 activation 11/14

KT7RC, Tortolita Radio Club members K7AZT and W8TK will activate Juan Bautista de Anza National Historical Trail K4571, US-AZ on November 14. QRG 14040 CW only 1600-2100Z. QSL via LoTW. Spots welcome.

Parks in the POTA program can be found on the [parksontheair.com](http://parksontheair.com) website. Click on MAP and find Tucson. POTA parks appear as yellow dots on the map. Some in our area include Picacho Peak SP, Oracle SP, Catalina SP, Saguaro NP, Chiricahua NM, Tumacacori NP. We were at Columbus Park which is not a POTA park but the Juan Bautista National Historic Trail, which runs along the bike path there, is POTA park K-4571.

I'm new to POTA and will figure out how to submit my log today. We used N1MM for logging so it should be easy.

W8TK



## Space.com: Arecibo radio telescope, an icon of astronomy, is lost.

The National Science Foundation (NSF) will decommission [Arecibo Observatory](#)'s massive radio dish after damage has made the facility too dangerous to repair, the agency announced today (Nov. 19).

Full story here:

<https://www.space.com/arecibo-observatory-radio-telescope-to-be-destroyed>

tnx to n7ghz

## PURPOSE

### TORTOLITA RADIO CLUB TORC

A group of amateur radio operators aiming to just have fun

located south of the Tortolita mountains near Marana

Serving the greater northwest Tucson area and beyond.

- No formalities
- No regular meetings - just occasional weekend outings
- Occasional newsletters will cover items of interest to the group
- **NO DUES**
- No repeaters
- Emphasis is on **having fun**
- **No bureaucracy**



**Newsletter editor:** Ron Herring W7HD

Material in this newsletter is public domain and may be freely shared.

Credit may be given as follows: ***Courtesy of Tortolita Radio Club***

Of course, we are just starting out, so there is a lot yet to come. Your feedback and articles are very much wanted. Please feel free to email me with **suggestions and articles** at [w7hd.torc@gmail.com](mailto:w7hd.torc@gmail.com) ...

If you are contributing an article, please include a photo of yourself as an attachment. The members would really like to be able to recognize you if they see you out in public (should that ever happen).

The word *tortolita* means little dove and is used here as a reference to the Tortolita Mountains north of Tucson, AZ USA.

The cactus field photo is courtesy of Chris Seger KI7DET.

The flag photo is courtesy of Ron Herring W7HD and was taken from my front porch.