



March 2021

ARCOver

A Community Service Organization Dedicated to Amateur Radio Since 1970

In this issue:

- ◆ President's Message
- ◆ 2021 Club Officers
- ◆ Meeting Info
- ◆ Up, Up and Away!
- ◆ Spacewalk Could Return ARISS Ham Station
- ◆ Approaches to Tackle Noise Problems
- ◆ Amateur Radio Helping to Fill
- ◆ Quantum Receiver Can Detect
- ◆ Some Patty's Day Humor



**LEAPING LEPRECHAUNS-
SO LUCKY TO HAVE SBARC!**

E-mail: W6SBA@arrl.net



Website: <http://www.w6sba.org>

President's Message

SBARC members,

The vaccinations are moving along and I have heard some members wanting to do a park get together. I think this should be doable before long. I am hoping that with the number of vaccines in the pipeline that the next group of people can get into line. I think this will go a long way to getting more confidence of getting into public spaces with others more frequently. I am hoping they ramp up the process as soon as possible. Stay positive and optimistic.

We are capturing a list of members who have had both C-19 vaccination shots in order to gauge the possibility of planning a park meetup and charcoal ignition event. Let us know at the net or via email if you have received your shots. Then we will be able swap some in person ham radio success stories. One of those topics will likely be about all those the balloon flights.

It's been an enthusiastic effort for the balloon team with the ongoing balloon launches. I say on going because since starting this activity a few years back it has continued moving steadily forward. Using the APRS positioning system and now moving to WSPR on 20m HF, they will have more global awareness of the balloons position. Many countries lack the ham radio APRS ground station and/or internet. The HF mode allows an impressive check in from possibly thousands of miles away. Well the ballooning successes continue to impress the club members with what ambitious efforts hams will do for a weekend project. Be sure to read Tom's latest ballooning recap on the following page.

For the March meeting, Bob Brehm-AK6R from Palomar Engineering will do his presentation on "End Fed Antenna Secrets for Portable, Emergency and Permanent installations". Palomar engineering makes some quality balun/unun ferrite products. This is area for any ham with interest in HF should have some knowledge of. In short the balun's and unun's are impedance transformers. That piece of wire we like to string up is nowhere near 50 ohms. These devices bring that end fed or half wave wire into an impedance range where an antenna tuner can bring it to the radio's 50 ohm impedance. And, in some cases an antenna tuner may not be required. As with many antenna designs, there are tradeoffs among different techniques fielded. So tune into our meeting on at 7:30PM March 18th with Bob Brehm and see what may work best for your station.

Upcoming monthly club activities include, the SBARC virtual Zoom club meeting on March 18th at 7:30PM. And, the other things we use to do: The TRW/NGC swap meet remains cancelled until? (We are keeping an eye on this one.) After the swap meet a few of us use to head over to Denny's. These have all been suspended until after the COVID shutdown.

As always, it's your amateur radio club, let us know what you would like to see happening with your club

73's...
Scott-N6LEM



CLUB OFFICERS

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Past Pres: OPEN

March Meetings

March 18th at 7:30 p.m.
on Zoom



Expect an email with the invite to the meeting. Click the link in the email and Zoom software launches to join.

Bob Brehm-AK6R from Palomar Engineering will do his presentation on "End Fed Antenna Secrets for Portable, Emergency and Permanent installations". (Palomar Engineering close to Palomar Mountain close to San Diego)



Bob is the Chief Engineer with Palomar Engineering; their specialty is RFI kits, Antennas and accessories, Baluns/Ununs, Ferrite beads, toroids and much more. Bob was first licensed as WN6QFA and as so many of us in those days you upgraded and you became WB6QFA when you got your Tech license, he now holds an Extra class license which he earned in 1997. His first rig was a Viking with 20 crystals for 80, 40 and 15 meters just what a 15 year old kid wanted to get started. This is how so many of us got started and off and running he was. He is now pretty big contester and has been awarded many rewards in CW, RTTY, SSB and also holds General Radiotelephone Operators License. He now also restores old tube gear and get on the bands regularly. As a matter of fact, he is now the auctioneer for many clubs here in the Southern California area. The latest reward won was "Oceanside Yacht Club Ugly sweater" which said 'We Fish you a Merry Christmas'. The couple have been lifetime boating people and just another of his hobbies.

Please join us this **Thursday March 18, 2021 at 7:30pm** via Zoom.



Well we ended last year with a failure and a fantastic success. The failure was a balloon we launched for Joanne KM6BWB and the school kids that leaked off Mexico and sank gracefully into the Pacific Ocean. That made the second failure for Joanne's STEM class and was a hash reminder that things don't always go the way you would like them too. The fantastic success was Greg's N6RRY balloon that was launched on November 14th 2020 and so far has circled the globe 5 times. After being in the air for about 4 months we think it may be lost but we will wait a bit before calling this flight finished. Also another success involved Jerry KJ6JJ who managed to fix the software on a number of transmitters that we had been unable to get to work for some time. A huge thank you to Jerry.

In February 2021 we launched our first WSPR transmitter transmitting on 20 and 30 meters under two 36 inch Mylar balloons with Bruce's callsign KK6BJ. This was a big learning experience for us because the transmitter had a 34 ft 20 meter vertical very thin wire dipole under the balloons. To track the balloons progress we used two programs - one that put little balloon symbols on a map (WSPRD) and the other that showed who was receiving our balloons 10mw signals (WSPRnet/map). The longest transmission was over 3200 miles to a station in Europe.

As I write this we plan to launch another WSPR transmitter tomorrow (March 13th) under two 36 inch Mylar balloons with my callsign KI6RC hoping to get more experience with this type of transmitter and maybe go all the way across the Atlantic. Also on March 20th (spring equinox) we will launch an SBS13 circumnavigation APRS balloon for Joanne's students with the hope that this one makes it all the way around the world. Callsign is KM6BWB-3.

Stay tuned for many more ballooning adventure this year. 73

Tom, KI6RC

Spacewalk Could Return ARISS Ham Station in ISS Columbus Module to the Air

ARRL.com 03/09/2021

Amateur Radio on the International Space Station (**ARISS**) reports that efforts to determine what's keeping the ham station in the ISS Columbus module off the air have been unsuccessful thus far. The radio equipment works, but no signal appears to be reaching the external ARISS antenna. The station, typically operated as NA1SS, has not been usable since new RF cables were installed during a January 27 spacewalk extravehicular activity (EVA) to support the commissioning of the **Bartolomeo** payload hosting platform installed last spring. During the January EVA, the coax feed line installed 11 years ago was replaced with another built by the European Space Agency (ESA) and Airbus.



An astronaut works outside the ISS during a March 5 spacewalk. [NASA TV]

ARISS has scheduled a March 10 news conference to discuss efforts to restore operational capability to the Columbus module ham station. The news conference will provide insights into some of the cable troubleshooting already conducted, ARISS said. During a March 13 spacewalk (EVA), astronauts Mike Hopkins, KF5LJG, and Victor Glover, KI5BKC, plan to return the ARISS antenna feed line cabling to its configuration prior to the January 27 spacewalk.

ARISS International Chair Frank Bauer, KA3HDO, said the ARISS team has been working closely with NASA and the ESA to identify what may have caused the “radio anomaly” keeping the ISS Columbus module ham station off the air.

This past week, astronauts on the ISS performed troubleshooting tests on all four new feed lines installed on the Columbus module. One cable was earmarked for the ARISS station, while the other three are for Bartolomeo. ARISS reported over the weekend, however, that it was unable to establish communication using any of the feed line cables connected to the ARISS radio system, which was tested in Automatic Packet Reporting System (APRS) mode.

The plan to return the ARISS cabling to its original configuration was a “contingency task” for a March 5 spacewalk, but the astronauts ran out of time. On March 5, astronauts Kate Rubins, KG5FYJ, and Soichi Noguchi, KD5TVP, worked on some other Bartolomeo cable/connector troubleshooting. If all goes well, the March 13 spacewalk will complete that work.

ARISS became aware of the station problem after a contact with a school in Wyoming, between ON4ISS on Earth and Hopkins at NA1SS, had to abort when no downlink signal was heard. For the time being, ARISS school and group contacts with crew members have been conducted using the ham station in the ISS Service Module.



Approaches to Tackle Noise Problems Vary, Remedies Elusive

ARRL.com 03/03/2021

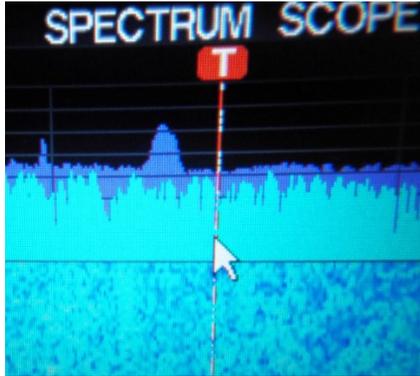
RF noise is a frequent discussion topic among radio amateurs. A proliferation of electronics has cluttered and complicated the noise environment; it's not just power lines anymore.

Unless isolated from civilization, most hams experience RF interference (RFI) — sometimes without even realizing it, although spectrum scopes on modern transceivers make RF noise much more apparent. Various approaches to address the apparently worsening noise floor have been taken around the world, some addressing lax regulation.

“We all want to enhance our ability to copy the weak ones by increasing our signal-to-noise ratio,” Alan Higbie, K0AV, said in his March/April NCJ article, “Tracking RFI with an SDR One Source at a Time.” He suggests practical methods for individual radio amateurs to improve their own noise environment. “We can do that by reducing the noise on each band that we operate. Lowering the noise floor increases the relative signal strength of weak signals. Those in typical residential environments find that locating and eliminating RFI sources is a never-ending process. It is much like weeding a garden.”

The International Amateur Radio Union (IARU) warns against complacency. “Radio amateurs cannot sit back, because even if the desired noise limits are agreed, there are many rogue manufacturers and dealers who will happily sell noise-generating devices, leaving out filter circuits to cut costs,” IARU said in a statement. IARU has urged member-societies to get involved.

The FCC Technological Advisory Council (TAC) — a Commission advisory group — initiated an inquiry in 2016 looking into changes and trends to the radio spectrum noise floor to determine whether noise is increasing and, if so, by how much. The TAC had encouraged the FCC to undertake a comprehensive noise study in 1998, and cautioned the FCC against implementing new spectrum management techniques or initiatives without first concluding one. In 2017, the FCC Office of Engineering and Technology (OET) invited comments on a series of (TAC) spectrum-management questions. ARRL, in its comments, took the opportunity to strongly urge the FCC to reinstate the 2016 TAC noise floor



study, which, ARRL asserted, was terminated before it even got started. ARRL urged the FCC to “depart from the traditional regulatory model” that placed limits only on transmitters and called for “a ‘holistic’ approach to transmitter and receiver performance.”

Greg Lapin, N9GL, represents ARRL on the TAC and chairs the ARRL RF Safety Committee.

“Perhaps the best result that we obtained was an indication that illegal devices, mainly LED lights, were in circulation, and the Enforcement Bureau agreed to look into it,” he told ARRL. “We never heard what they found out, but recently, I was buying some LED bulbs over the internet from a site in Texas, and they were selling non-FCC approved lights — and didn’t seem to care.” Lapin said his complaint went nowhere, and the TAC’s focus has been nudged in the direction of addressing 5G issues.

Some national regulators are paying attention to noise complaints, although not necessarily from users of licensed services. In the UK, regulator Ofcom recently dispatched an engineer just 30 minutes after receiving a report of interference to unprotected license-exempt devices — key fobs in this instance. “On rare occasions, faulty or unauthorized equipment can interfere with nearby technology and prevent it from working properly,” Ofcom said. Unclear is whether interference to licensed services would get the same level of attention.

Participants at the 2017 International Amateur Radio Union (IARU) Region 1 Conference in Germany, devoted considerable discussion to noise issues and the need to monitor the noise floor. The Deutscher Amateur Radio Club (DARC) has been working on developing a noise measurement system that approximates methods used by the International Telecommunication Union-Radiocommunication Sector (ITU-R). DARC reported that 35 of these electrical noise area monitoring systems (ENAMS) have been delivered, and it’s seeking another 20 locations as part of the effort to monitor noise interference on the HF bands. DARC said the ENAMS can help to make scientifically reliable statements about interference levels.

The IARU Region 1 EMC (electromagnetic compatibility) RF Noise Measurement Group meets quarterly to share ideas and experiences. One project under consideration is development of a common database to gather output from various monitoring stations for further analysis.

Continued on page 6

Approaches to Tackle Noise Problems Vary, Remedies Elusive Continued

IARU sees wireless power transmission (WPT) technology as an impending major noise threat, especially from WPT electric vehicle (WPT-EV) charging systems. “For the amateur service, given the planned density of WPT-EV systems, it is calculated that there will be a widespread and serious impact on its operation in the vicinity of WPT systems” from spurious emissions, said a 2019 IEEE publishers article, written by “Amateur radio societies concerned about the HF noise floor.” The article also said, “To ensure a low probability of harmful interference to radiocommunication services, further study is required, including evaluation of real equipment, mitigation techniques and other measures to improve WPT-EV systems.”

The South African Radio League (SARL) is encouraging radio amateurs to set up their own RF noise monitoring systems using a dongle and a Raspberry Pi. The HF noise monitoring system takes 12×1 MHz bandwidth samples every 2 minutes, saving the data to a file.

Amateur Radio Helping to Fill Earthquake Report “Donut Holes”

ARRL.com 02/25/2021

An [article](#) describing how radio amateurs can help fill the information “donut hole” by providing post-earthquake “did you feel it” (DYFI) reports via [Winlink](#) HF radio email appeared on February 22 in the American Geophysical Union (AGU) magazine *Eos*. As the article points out, “Ham radio networks gear up to provide real-time, on-the-ground information about earthquake shaking and damage when other communication pathways are knocked out of commission.” Authors of the article were David J. Wald of the US Geological Survey (USGS), Vincent Quitoriano, and Oliver Dully, K6OLI.

As the article explains, DYFI uses a questionnaire to gather individuals’ experiences and observations, and USGS uses the information to evaluate the shaking intensity at that person’s location. DYFI has been in operation since 1999 in the US and 15 years around the world, during which the USGS has gathered more than 5 million individual DYFI intensity reports.

The article notes that a potential problem is that “public access to it may be compromised as a result of strong earthquake shaking,” with affected individuals experiencing power and communication outages or may be distracted by

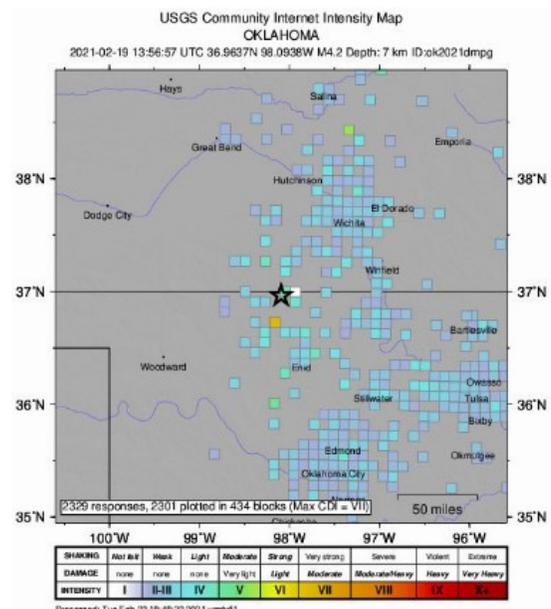
more immediate priorities.

“USGS and other global seismic network operators have witnessed report ‘donut holes’ in areas of strong shaking due to loss of internet communication,” the article said, “most recently during the magnitude 5.7 earthquake that hit near Salt Lake City in March 2020.” The article suggested that “alternative pathways” of communication are needed to “gather important ground-truth shaking data with minimal delay.” And this is where amateur radio groups come into play.

“We now expect to sample the donut hole with the help of amateur radio groups worldwide,” the article’s authors said. “These groups, which already provide emergency communications capabilities to government agencies, hospitals, and other critical users during emergencies and disasters, can mobilize a significant number of licensed radio operators after a strong earthquake, especially near large population centers, ensuring a baseline level of macroseismic intensity reporting, even in heavily affected areas.”

As the article explains, USGS has partnered with [Winlink](#), a radio email platform with more than 28,000 users worldwide, and with ARRL Amateur Radio Emergency Service (ARES®) members. “In June 2020, Winlink experts adapted the USGS DYFI questionnaire to their software platform, and this version is now available to all licensed amateur radio operators.”

This means that during a major earthquake, Winlink users can send their responses via radio to far-away receiving stations if they’ve lost internet service. “These unaffected, out-of-area stations, or gateways, can then forward data via the internet to USGS for immediate analysis,” the article said.



Quantum Receiver Can Detect Huge Swath of the RF Spectrum

03/04/2021

US Army researchers have built a so-called “quantum sensor,” which can analyze the full RF spectrum and real-world signals, a **report** on

Physics.org says. The quantum sensor — technically a Rydberg sensor — can sample the RF spectrum from 0 to 20 GHz and is able to detect AM and FM radio signals, as well as Bluetooth, Wi-Fi, and other RF communication protocols. The peer-reviewed *Physical Review Applied* published the researchers’ findings, “Waveguide-coupled Rydberg spectrum analyzer from 0 to 20 Gigahertz,” coauthored by Army researchers David Meyer, Paul Kunz, and Kevin Cox.

“The Rydberg sensor uses laser beams to create highly excited Rydberg atoms directly above a microwave circuit, to boost and hone in on the portion of the spectrum being measured,” the article explains. “The Rydberg atoms are sensitive to the circuit’s voltage, enabling the device to be used as a sensitive probe for the wide range of signals in the RF spectrum.”

Cox, a researcher at the US Army Combat Capabilities Development Command (**DEVCOM**) Army Research Laboratory, called the development “a really important step toward proving that quantum sensors can provide a new and dominant set of capabilities for our soldiers, who are operating in an increasingly complex electromagnetic battlespace.”

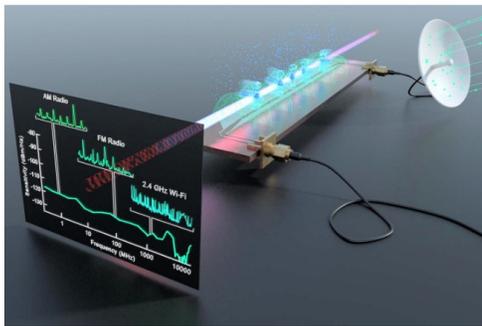
Cox said earlier demonstrations of Rydberg atomic sensors were only able to sense small and specific regions of the RF spectrum, but “our sensor now operates continuously over a wide frequency range for the first time.” The technology uses rubidium atoms, which are excited to high-energy Rydberg states. These interact

strongly with the circuit’s electric fields, allowing detection and demodulation of any signal received into the circuit.

The report says the Rydberg spectrum analyzer has the potential “to surpass fundamental limitations of traditional electronics in sensitivity, bandwidth, and frequency range.

According to Meyer, “Devices that are based on quantum constituents are one of the Army’s top priorities to enable technical surprise in the competitive future battlespace. Quantum sensors in general, including the one demonstrated here, offer unparalleled sensitivity and accuracy to detect a wide range of mission-critical signals.”

The researchers plan additional development to improve the signal sensitivity of the Rydberg spectrum analyzer, aiming to outperform existing state-of-the-art technology. “Significant physics and engineering effort is still necessary before the Rydberg analyzer can integrate into a field-testable device,” Cox said.



A Rydberg receiver and spectrum analyzer detects a wide range of real-world radio frequency signals above a microwave circuit including AM radio, FM radio, Wi-Fi, and Bluetooth. [US Army illustration]



- **What do you get when you cross poison ivy and a four leaf clover?** *A rash of good luck!*
- **Why shouldn't you iron a four leaf clover?** *You don't want to press your luck!*
- **Why do leprechauns hate running?** *They'd rather jig than jog.*
- **Why do leprechauns love to garden?** *They have green thumbs!*
- **Why shouldn't you borrow money from a leprechaun?** *Because they're always a little short.*
- **When does a leprechaun cross the road?** *When it turns green!*
- **How did the leprechaun win the race?** *He took a shortcut.*
- **What did the leprechaun say when the video game ended?** *Game clover!*
- **How can you tell if a leprechaun likes your joke?** *He's Dublin over with laughter!*



CALENDAR

Council Meeting - 4th Wednesday of the month
Call Joe - WB6MYD (310) 328-0817

Club Meeting - 3rd Thursday of the month
March 18, 2021 - 7:30 p.m.

Via Zoom

(look for email invite from
jmlanphen@gmail.com a few days before)

Club Nets - **W6SBA WEEKLY NET**
Every Thursday @7:30pm
(except the night of club meetings)
PVUSD EMERGENCY NET
1st Tuesday of the month
09:30 Hours on the W6SBA repeater

TRW Swap Meet **Cancelled Until Further Notice**

VE Sessions - **Cancelled due to Covid-19**
Contact Betty, N6VZF, with questions
(All VE sessions are scheduled for Room 4 in the Health
Conference Center)

Social Event - **Contact: Joe WB6MYD**
Phone: (310) 328-0817
jmlanphen@gmail.com

CLUB SERVICES

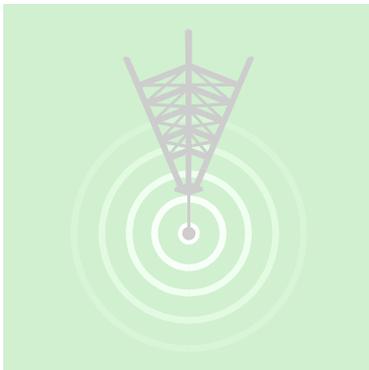
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South Bay Amateur Radio Club Repeater
224.38 MHz · PL - 192.8 Hz Offset -1.6 MHz
(See Calendar for Weekly Net Times)

NEWSLETTER SUBMISSION

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