

## QRM FROM THE PRESIDENT

*Larry Telles, K6SPP*

Well, the calendar is getting very thin and we all know what that means. There are only a few things left till the end of the year. The Christmas party is three months away, but another yearly event is right on our heels. It is the nomination of officers for 2019. I will not be running for a second term. I could use health reasons for the decision, but I won't. Why? It's the easy way out. Especially, a health story with a happy ending.

It all started in September of this year. That is when I had my teeth surgery. Since I had two deteriorating jaw bones, I had to have two implants. The operation of teeth extraction and temporary implants installed was done in one day. During the night I must have gotten up and in doing so, fell hitting my head. When I awoke the next morning it looked like a murder scene in my bedroom and bathroom. I went back to the dentist that morning to get some fixing up.

I didn't think much of the mysterious fall I took as the days progressed. I should have paid attention to my daily headaches. It all came to a head this last Saturday night. I was on my way to make a 2 hour presentation on "Where Movies Came From," at the Jacklin Arts and Cultural Center in Post Falls. At about fifteen miles an hour I rear ended a large pickup truck. I told the law enforcement officer that I felt fine except for my headache. She said she would give me a ticket if I went to the Art Center and no ticket if I went to the hospital for a routine check-up.

At the hospital I was rushed into the operating room when the Cat Scan showed a large amount of blood on my brain. So, Saturday, September 29th, I had an operation to drain my brain which was a success. I did get to go home last Tuesday. I have a great caregiver and complete recovery is only days away.

So, if that's not the reason for running, what is? No one appears to want to do anything. Standing in front of the room, you can hear a pin drop when the word volunteer is used. Some say we are a repeater club, and some say a social club. I know we aren't a DX club. That is, unless you count Spokane as DX. No, I have failed to motivate a group of Amateur Radio Operators in moving their hobby forward. Since I like to see positive results, I will be leaving KARS to finish book number four and start book number five. It has been interesting second Monday night's for the past sixteen years. I am hoping that my successor can do what I failed to do.

73, Larry K6SPP

p.s. 73 is singular not plural.

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### September 2018 Meeting Minutes

The September 10, 2018 KARS meeting was held at the Search & Rescue Building located at 10865 N Ramsey Rd. Hayden, Idaho.

The meeting was called to order at 7:05 pm by Club President Larry Telles (K6SPP). The Pledge of Allegiance was led by David Winton (KI7NPY)

Attendance: Twenty-five members and three visitors were in attendance.

VE Testing: Six people tested and the results were as follows:

Passed Technician	4
Passed General	1
Passed Technician, General, and Extra	1

Minutes: Mitch Killebrew (KB7BYR) moved to accept the August 2018 minutes as written; Jim

Petersen (AD0AZ) seconded; the motion passed by member vote.

Jim Petersen (AD0AZ) reported on the volunteers for the Fair, Canfield weed crew, and the Center Target customer appreciation event. Jim encouraged more participation for next year.

The Treasurer's Report was given by Jim Petersen (AD0AZ):

August 2018

Checking	\$ 664.65
Savings	\$1,077.40
Petty Cash	<u>\$ 83.56</u>
TOTAL	\$1,825.61

Income: Savings interest (\$0.04), 50/50 Raffle (\$7.00), Memberships (\$58.00), Fee Return from Rathdrum Parks & Recreation (\$25.00), Donations (\$5.00), Reimbursement for Fair Parking Pass (\$15.00)

Expenses: Office Max Trifold fliers (\$42.93), Office Max Secure Shred, Vest back panels and name tags (\$48.69), Additional tickets for Fair (\$51.00), Antenna Trailer - parts and repairs (\$24.29), Office Max Additional fliers (\$13.78), Industrial Communications - Repeater - Link Radios (\$970.20)

Mike Slothower (KG7KSJ) moved to accept the Treasurer's report; Steve Murphy (KG7UWB) seconded; the motion passed by member vote.

Larry Telles (K6SPP) announced that the nominating committee will be chosen at the October meeting. Club officer elections will be held at the November meeting. New officers will be installed at the December meeting.

Jim Petersen (AD0AZ) announced that this year's KARS Christmas party will be held at the Rathdrum Senior Center. It will be the same night as the regular club meeting (second Monday).

Evening Presentation: Jerry Hart (W7KR) and Frank Krug (KD7FK) gave an introduction to Morse Code. A sign up sheet was circulated for indicating interest in a Morse code class.

Raffle Results: 50/50 \$8.00 Terri O'Rourke, KI7VAZ (claimed)

Membership \$79.00 Eric Hallgren, KI7OIX (not claimed)

Mike Slothower (KG7KSJ) moved to adjourn; Bob Kesson (K7CGA) seconded. The motion passed by member vote and the meeting was adjourned at 8:26 pm.

Amateur Radio Volunteers in Indonesia Link Earthquake Zone with Outside World

Following a devastating 7.7-magnitude earthquake and tsunami in Central Sulawesi, Indonesia, on September 28, members of International Amateur Radio Union ([IARU](#)) member-society Organisasi Amatir Radio Indonesia (OARI) and other volunteers have been providing emergency communication for community and government interests. The quake and tsunami destroyed the city of Palu, completely cutting power and telephone connections, as well as the cellular communication infrastructure.

New IARU Region 3 Disaster Communication Coordinator Dani Halim, YB2TJV, said Amateur Radio operators in Indonesia immediately responded to the unfolding disaster, establishing an emergency net on 7.110 MHz Amateur Radio volunteers from other regions also pitched in to support radio communication for emergency news on 7.110 MHz and 7.065 MHz OARI has asked that radio amateurs not involved in the emergency response avoid those frequencies. OARI also activated the LAPAN-OARI IO-86 satellite as a back-up communication channel. Some radio amateurs with mobile stations have traveled to the affected region to help.

According to Budi Santoso, YF1AR, on Java Island, the local Palu OARI representative Ronny Korompot, YB8PR, was among the first contacted. Through his mobile station, he reported on conditions and the response, including evacuations. Sutrisno Sofingi, YB8NT, was also heard on 7.110

MHz using an emergency station he assembled at the disaster site. He said Amateur Radio was the only available communication with the outside world.

Amateur Radio also has assisted government agencies following severe damage to the telecommunication infrastructure. Hams operating on 2 meters were communicating information on which roads were open to allow traffic from the outside.

Halim reported that communication was established from the Luwuk Disaster Management Agency some 430 miles from the earthquake's epicenter to obtain information on landslides and blocked roads and highways.

Salmin Sahidin, YB8IBD, in Southeast Sulawesi has been [live streaming audio](#) of the activity on 7.110 MHz via his Facebook page.

The earthquake and subsequent tsunami has claimed upward of 900 lives and caused widespread devastation. Some victims have been reported to be trapped in the debris. The Indonesian National Disaster Mitigation Agency has told news media that, in addition to communication, heavy equipment for rescue operations is limited. - *Thanks to IARU Region 3 and Budi Santoso, YFIAR*

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### AREDN Releases a Major Upgrade to its Mesh Network Software

AREDN just released version 3.18.9.0, a significant upgrade of its mesh operating system. New features in this release include:

- Support for nearly the entire line of Ubiquiti AirMAX commercial wireless routers, including its newer "XW" versions
- Support for new devices from TP-Link and MikroTik bringing vendor diversity to its offering
- A greatly simplified software installation and upgrade process which eliminates unique software installation instructions for specific models
- Thousands of enhancements and bug fixes to OpenWRT, the core-basis of AREDN. The improvements are derived from the last four years of open source development. The current OpenWRT code base brings additional stability and security to the network
- An upgrade to the current version of the Linux kernel, improving the stability of the network and increasing the utilities a control operator has at his/her disposal
- Expanded the maximum number of "local server" IP addresses from 13 to 29, increasing the number of services a ham can offer others on the network
- An enhanced antenna pointing tool that simplifies alignment of high-gain/narrow beam width nodes

This represents the culmination of over 2 years of work and is a major milestone for this all ham/all volunteer project team.

AREDN Inc. is a non-profit, Open Source, software development group which writes and promotes the development of firmware for repurposing Wireless ISP (WISP) devices for use under 47 CFR Part 97 - Amateur Radio Service. The repurposed devices, referred to as "AREDN Nodes" are deployable by licensed amateur radio operators ("Hams") and which interoperate to form a high-speed data network useful to emergency responders and disaster service agencies during times of local and regional disasters. Details can be found on the website at [www.arednmesh.org](http://www.arednmesh.org)

AREDN is a 501(c)(3) public charity. Contributions to the project may be tax deductible. Before contributing, check with your tax advisor to determine if this is available to you.

For more information, contact Randolph W. Smith, [wu2s@arednmesh.org](mailto:wu2s@arednmesh.org)

See the AREDN website for further information and software, [www.arednmesh.org](http://www.arednmesh.org)

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## ARRL, FCC Discussing Issue of Uncertified Imported VHF/UHF Transceivers

ARRL has taken a minor exception to the wording of a September 24 [FCC Enforcement Advisory](#) pertaining to the importation, marketing and sale of VHF and UHF transceivers and is in discussion with FCC personnel to resolve the matter. The *Enforcement Advisory* was in response to the importation into the US of certain radio products that are not FCC certified for use in any radio service, but identified as Amateur Radio equipment.

“While much of this equipment is actually usable on Amateur bands, the radios are also capable of operation on non-amateur frequencies allocated to radio services that require the use of equipment that has been FCC-certified,” ARRL said. “Such equipment is being marketed principally to the general public via mass e-marketers and not to Amateur Radio licensees.”

ARRL said the upshot is that the general public has been purchasing these radios in large quantities, and they are being used on the air by unlicensed individuals.

“Radio amateurs have complained of increased, unlicensed use of amateur allocations by people who are clearly unlicensed and unfamiliar with Amateur radio operating protocols,” ARRL said. But while it supports the general tenor and intent of the Enforcement Advisory, ARRL said it disagrees with the FCC on one point.

“In several places, the *Enforcement Advisory* makes the point that ‘anyone importing, advertising or selling such noncompliant devices should stop immediately, and anyone owning such devices should not use them,’” ARRL pointed out. “The Advisory broadly prohibits the ‘use’ of such radios, but our view is that there is no such prohibition relative to licensed Amateur Radio use - entirely within amateur allocations - of a radio that may be capable of operation in non-amateur spectrum, as long as it is not actually used to *transmit* in non-amateur spectrum.

ARRL has had extensive discussions about this issue with FCC Wireless Bureau and Enforcement Bureau staff, and those discussions are ongoing.

“It is important to protect the flexibility of the Amateur Service as essentially an experimental radio service, but it is also very important to stop the unlawful importation and marketing of illegal radios in the United States and the use of those radios by unlicensed persons,” ARRL maintained. “We will keep our members informed as our discussions with FCC on this subject continue.” (ARRL News)

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## “Black Swan 18” Exercise to Test US Government/Amateur Radio Interoperability on 60 Meters

“Black Swan 18” is a communications exercise aiming to test how well responders, emergency management agencies, and non-government organizations (NGOs) activate, operate, and complete communication missions, specifically in terms of the volume, accuracy, and speed of radio traffic. The scenario for the October 4 - 10 Black Swan 18 will be a series of winter storms and associated events. ARRL Field Organization teams have been invited to adapt this activity as the basis of their annual Simulated Emergency Test (SET). Operational periods by participating organizations should not exceed 48 hours.

“In a high-impact disaster, response will need to include many organizations bringing their unique expertise and resources to bear in a coordinated fashion,” the Black Swan 18 announcement explains. “Black Swan 18 will test this ability to operate across geography and among complementary organizations. Cooperating forces include the Ohio Military Reserve (2nd Battalion), the ARRL Ohio and Iowa sections, and Air Force MARS.”

For this exercise, communication between US government radio stations and Amateur Radio stations is authorized on the five channels at 5 MHz where the Amateur Service has secondary status.

Exercise communications must yield to real-world emergency communications. Interoperability will remain in effect for the duration of the exercise.

The exercise will run in three stages:

1. “Build-Up” is October 4 - 5, when organizations involved in preparation for large events or response to localized emergencies may wish to participate.

2. “Intense Action” is October 6 - 7, when most organizations will be establishing operating stations and handling radio traffic in support of emergency preparation, response, and recovery. Organizations that cannot participate during the “Intense Action” timeframe may run their own exercises in any 48-hour window during the scenario.

3. “Recovery” is October 8 - 10, when organizations preparing for and engaged in recovery operations may wish to participate.

Localized severe weather events and effects may cause activation in the week before or the week after the scheduled timeframe.

Ohio Military Reserve will provide exercise controllers on SHARES stations NNO5HA, NNO5HD, and NNO5HG. This activation has been approved by the FEMA Spectrum Manager. (ARRL News)

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### Digital Mobile Radio Hotspots May Be Interfering with Satellite Uplinks, AMSAT Reports

This week, AMSAT News Service (ANS) cited an August 27 report from AMSAT Vice President-Operations Drew Glasbrenner, KO4MA, saying that a digital mobile radio (DMR) signal has been interfering with the AO-92 (Fox-1D) satellite’s 435.35 MHz uplink frequency. Glasbrenner said hotspots, repeaters, terrestrial simplex, and “anything not satellite” should never transmit in the segments 145.8 - 146.0 MHz or 435 - 438 MHz by international band plan. Well-known satellite enthusiast Patrick Stoddard, WD9EWK/VA7EWK, told ARRL that one DMR hotspot operating on the AO-92 uplink frequency in the St. Louis area has shifted to another frequency. But, he added, “I think there are still issues, since not all hotspots will report their frequencies and positions to websites such as [BrandMeister](#) or via APRS, where they appear on other sites such as <http://aprs.fi>.”

“There are others surely operating near satellite uplinks,” Stoddard added. “For many, the 435 - 438 MHz satellite subband is a big piece of quiet real estate in a busy part of the 70-centimeter band for weak-signal work, repeater links, amateur TV, and other possible uses.”

Stoddard points out that FCC Part 97 addresses Amateur Radio operation in these segments, although regulations in many other countries may not be as detailed. §97.3(a)(7) defines Auxiliary Stations as, “an amateur station, other than in a message forwarding system, that is transmitting communications point-to-point within a system of cooperating amateur stations.”

Stoddard said this would include remote bases, EchoLink and IRLP nodes, and hotspots used for digital voice modes, as well as stations using these hotspots and nodes. Auxiliary stations may not transmit in the 145.8 - 146.0 and 435 - 438 MHz satellite subbands (among others in the 2-meter and 70-centimeter amateur bands), per §97.201(b).

- §97.3(a)(40) defines a repeater as, “an amateur station that simultaneously retransmits the transmission of another amateur station on a different channel or channels.” Stoddard said that because most hotspots operate on a discrete frequency, they would not qualify as repeaters, even if they operate like a repeater, per §97.205(b).
- §97.101(a) stipulates, “In all respects not specifically covered by FCC Rules, each amateur station must be operated in accordance with good engineering and good amateur practice.” Stoddard remarked, “Whether the hotspot is interfering with a satellite downlink in a particular area, or it is interfering with the satellite uplink affecting a much larger area, this would not be good amateur practice.”

- In addition to subbands where hotspots are not permitted, Stoddard said, §97.101(b) is also relevant. It states, “Each station licensee and each control operator must cooperate in selecting transmitting channels and in making the most effective use of the Amateur Service frequencies. No frequency will be assigned for the exclusive use of any station.”

Stoddard noted that frequencies used by satellites are usually incapable of being changed and are coordinated in advance of launch, while hotspots typically are frequency agile, and the frequencies used by those systems can be changed to avoid potential interference to satellites and other stations. - *Thanks to AMSAT News Service, Patrick Stoddard, WD9EWK/VA7EWK*

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## IARU Region 1 Volunteers and Partners Getting Behind WRC-19 50 MHz Agenda Item

International Amateur Radio Union ([IARU](#)) volunteers are continuing their work toward a favorable outcome for World Radio Conference 2019 (WRC-19) Agenda Item 1.1, which seeks a 6-meter allocation for the Amateur Radio Service in Region 1 in the International Telecommunication Union (ITU) *Radio Regulations* Table of Frequency Allocations. The effort is aimed at aligning the band with the 50 MHz allocations in ITU Regions 2 and 3. In a news release, IARU Region 1 ([IARU R1](#)) President Don Beattie, G3BJ, [described](#) extensive work in various forums and the ITU aimed at gaining support for a 6-meter band in Region 1, rather than the current country-by-country allocations.

“IARU has represented the global voice of Amateur Radio in these meetings, arguing that new applications in Amateur Radio require significant bandwidth at 50 MHz and has set out a proposed utilization of the band which supports its claim,” Beattie said. He added that the IARU has also engaged in extensive work on sharing studies using propagation models recognized by the ITU and the European Conference of Postal and Telecommunications Administrations (CEPT).

“The Amateur Service has met strong opposition from a few nation states who argue that the 50 MHz band is already allocated to other services in their countries - following the closure of many broadcasting stations in recent years which operated in this band - and believe that sharing the band presents problems,” Beattie said.

CEPT Project Team D has prepared two Agenda 1.1 options. The majority of CEPT administrations actively participating in discussions preferred one proposal for a 2 MHz secondary allocation. The second option, the result of a major compromise and preferred by IARU and the European Radio Amateurs’ Organization ([EURAO](#)), would see a 500 kHz primary allocation of 50.0 - 50.5 MHz, paired with a secondary allocation of 50.5 - 52.0 MHz. Beattie said either option would be an improvement over the status quo.

Additional meetings lie ahead, including a CEPT Conference Preparatory Group (CPG) meeting in November, and the ITU Conference Preparatory Meeting (CPM) in February.

“It is hoped that the cooperation between IARU and EURAO will continue in future CEPT activities, which are relevant to Amateur Radio,” Beattie said. (ARRL News)

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## IN NEW ZEALAND, 'CAR QSOs' NOT EXACTLY MOBILE CONTACTS

NEIL/ANCHOR: Our final story comes to us from New Zealand. It's about amateur radio contact with cars - but this has nothing to do with operating mobile. Jim Meachen, ZL2BHF explains.

JIM: Any ham who's ever chased a rare DX or tried for a special event in a pileup knows the frustration of the QSO that got away - but have you ever considered all those contacts you never wanted in the first place?

That's what happened recently on 434.050 MHz in New Zealand where a repeater transmitting on that frequency turned up some unintended contacts. Not far away from the repeater, motorists in the business district of Invercargill discovered one morning they were unable to get into their locked cars.

The vehicles had been secured with keyless entry fobs so common these days with newer cars - remotes that operate by short-range radio transmission. One local auto dealer was quoted on the website, The Stuff, as saying that people had begun coming in for replacements for their car remotes, believing their devices had malfunctioned.

After local police contacted the Radio Spectrum Management compliance office of the Ministry of Business Innovation and Employment, an investigation determined that the culprit was a repeater registered to amateur radio operator Daniel Erickson, ZL4DE. The news report on the website noted that the repeater was allocated the transmit frequency of 434.050 MHz in its license - but, as it turns out, so are the car remotes. According to the RSM compliance manager Fadia Mudafar, hams have primary use of the frequency range between 433.050 and 434.920 MHz - the same frequency range as the car remotes, which are approved for short-range secondary use.

The result? Unwanted QSOs with the cars.

Well, the repeater has gone off the air for now until a solution can be worked out - and soon enough, everyone should be back in the driver's seat.

For Amateur Radio Newsline, I'm Jim Meachen, ZL2BHF.

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### Investigation into International Space Station Leak Continues

NASA has issued a statement regarding a leak affecting the International Space Station ([ISS](#)). On August 29, a mysterious 2-millimeter hole was discovered on a *Soyuz* capsule docked to the ISS, resulting in a pressure leak.

The *Soyuz* capsule last carried to the ISS cosmonaut Sergey Prokopyev, and astronauts Serena Auñón-Chancellor, KG5TMT, and Alexander Gerst, KF5ONO. It is scheduled to return them to Earth in December.

The hole, which appeared to have been drilled, was repaired by the crew. Roscosmos said this week that the hole was not drilled by accident, opening the possibility of sabotage. Roscosmos Director General Dmitry Rogozin earlier ruled out a manufacturing defect.

“[This] indicates that this is an isolated issue which does not categorically affect future production,” the NASA statement said. “This conclusion does not necessarily mean the hole was created intentionally or with mal-intent.”

Roscosmos has claimed the hole may have been drilled by a technician on the ground.

NASA and Roscosmos continue to investigate the incident to determine the cause, and a November spacewalk is planned in order to gather more information.

On October 11, US Astronaut Nick Hague, KG5TMV, and Russian Cosmonaut Aleksey Ovchinin will head to the ISS aboard a Russian *Soyuz* MS-10 spacecraft. NASA Administrator Jim Bridenstine is scheduled to attend the launch and plans to meet with Rogozin at that time. (ARRL News)

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### MARS Members to Support Defense Department Radio Communication Readiness Exercise

Military Auxiliary Radio System (MARS) members will support a Department of Defense HF radio communication exercise October 24 - 26. The readiness exercise will test the ability to communicate via voice and military standard communication protocols, simulating the loss of conventional communication systems. MARS members will interface with the Amateur Radio community to collect information at the county level regarding publicly available information.

Amateur Radio operators are asked to monitor 60-meter channel 1 (5,330.5 kHz, USB) at 0001 UTC on October 24, for a high-power broadcast of updated information regarding this exercise and how the Amateur Radio community can participate.

During the exercise, MARS members will communicate with Amateur Radio operators on all five 60-meter channels, as well as on other Amateur Radio bands. [Contact](#) MARS for more information regarding this exercise. As a simulation, this exercise will not affect any public or private communications or infrastructure. The exercise will end at 2359 UTC on October 26.

Additionally, MARS members will participate in the HF automatic link establishment (ALE) on-the-air exercise taking place October 12 - 22. (ARRL News)

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#### Online Fundraising Campaign Backs ISS Radio Upgrades

[ARRIS](#) and [AMSAT](#) are supporting a [FundRazr campaign](#) to raise \$150,000 for critical ham radio infrastructure upgrades on the International Space Station (ISS).

“ARRIS is in critical need of infrastructure upgrades to ensure that programs such as talking to astronauts in space using Amateur Radio can continue,” ARISS International President Frank Bauer, KA3HDO, said. ARISS seeks several upgrades, including new Amateur Radio communication and experiment capabilities, such as an enhanced voice repeater, updated digital Automatic Packet Reporting System (APRS), and slow-scan television (SSTV) with image uplinks and downlinks in both US and Russian segments; next-generation radio systems that will support easier mode and capability transitions, and a multi-voltage power supply to support present and future radio capabilities.

Bauer points out that ARISS needs to build 10 next-generation radio systems to support the development of on-orbit operations, training, and long-term maintenance. This includes two units for on-orbit use (one unit each for the US and Russian segments), two flight spares, three units for training, one unit for testing, and two units for ground-based maintenance and troubleshooting. - *Thanks to AMSAT News Service via Frank Bauer, KA3HDO*

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#### Radio Amateurs Receive Images from Chinese Lunar Satellite

Some earthbound radio amateurs and sky watchers have received images from a tiny Chinese satellite now orbiting the moon. In May, China launched the DSLWP-A and DSLWP-B microsattellites - also known as *Longjiang-1* and *Longjiang-2* - into a lunar transfer orbit, although *Longjiang-1* was apparently lost in the process and likely remains in deep Earth orbit. They were deployed as secondary payloads with the *Queqiao* relay satellite as part of the Chang’e 4 mission to the far side of the moon. DSLWP stands for “Discovering the Sky at Longest Wavelengths Pathfinder.” The satellite will test low-frequency radio astronomy and space-based interferometry, and while it carries Amateur Radio and educational payloads, no transponder is aboard.

The Chang’e 4 mission will be the first-ever attempt at a soft landing on the far side of the moon. The Chang’e-4 lander and rover are scheduled to launch in December. The Harbin Institute of Technology (BY2HIT) developed and built the DSLWP spacecraft and is overseeing that mission. The microsat also carries optical cameras from Saudi Arabia.

An open telecommand protocol allows radio amateurs to take and download images. The spacecraft transmits on 70 centimeters (435.400/436.400 MHz) with 250/500 bps GMSK using 10 kHz wide FM single-channel data, with concatenated codes or JT4G. JT4 uses four-tone FSK, with a keying rate of 4.375 baud; the JT4G sub-mode uses 315 Hz tone spacing and 1,260 Hz total bandwidth.

According to an [article](#) in *GBTimes*, *Longjiang-2* (DSLWP-B) used its own propulsion system to slow down and enter lunar orbit, while the relay satellite “continued past the moon to its special destination.” *Longjiang-2* has used a student-developed camera to take images of the moon, Mars, the sun, and other celestial objects. Data and images have been downloaded by hams and satellite tracking enthusiasts around the world, including the US, Brazil, China, the Netherlands, and Italy.

The Harbin Institute of Technology team also operates [LilacSat-1](#), a 2U Amateur Radio CubeSat launched as part of the European QB50 initiative, and [LilacSat-2](#) (CAS-3H), an Amateur Radio and technology test satellite.

The *Queqiao* communications relay satellite is required for the lunar far-side landing to facilitate communication with a not-yet-launched lander and rover because the moon's far side never faces Earth, and some significant scientific measurements from the dark side of the moon require real-time contact with Earth. *Queqiao* was developed by the China Academy of Space Technology (CAST).

The Harbin Institute of Technology Amateur Radio Club has invited more radio amateurs to get involved with the DSLWP mission, and QSL cards have been designed for different flight phases for amateurs who successfully receive telemetry or make contact. (ARRL News)

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### Remembering the Launch of Sputnik 1 - Earth's First Artificial Satellite

October 4 marks the 61st anniversary of the launch by the Soviet Union of *Sputnik 1*, Earth's first artificial satellite. The Soviets heralded the launch as a national triumph, and the space race between the USSR and the US began.

*Sputnik 1* was a 58-centimeter diameter, polished aluminum sphere sprouting four antennas and transmitting a 1 W signal on 20.005 and 40.002 MHz, putting it within the range of nearly any radio amateur. Orbiting the planet about once every 96 minutes, *Sputnik 1* could be seen from Earth. Following the launch, the US National Institute of Standards and Technology's HF radio station WWV even halted its nighttime 20 MHz transmissions to avoid interfering with the satellite's signal.

Scientists studying it gained information about such things as the density of the upper atmosphere, deduced from orbital drag. The propagation of its signals also helped to better understand the ionosphere. The US launched its first artificial Earth satellite, *Explorer 1*, on January 31, 1958. (ARRL News)

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### Spray-On Antennas Could Be the Wave of the Future, University Researchers Believe

Researchers at Drexel University's College of Engineering [report](#) a breakthrough in nanomaterials technology that promises to make installing an antenna as easy as applying sunblock or bug spray. The University reported the research in a *DrexelNOW* article, "Drexel's Spray-On Antennas Could Be the Tech Connector of the Future." The advance could mean wearable and invisible antennas that could find their place in the next generation of the Internet of things (IoT), and even have Amateur Radio applications.

"The ability to spray an antenna on a flexible substrate or make it optically transparent means that we could have a lot of new places to set up networks," said Drexel Wireless Systems Laboratory Director and engineering professor Kapil Dandekar, a co-author of the research published recently in *Science Advances*.

"This technology could enable the truly seamless integration of antennas with everyday objects which will be critical for the emerging Internet of things," Dandekar said.

In their paper, Dandekar and his colleagues laid out a method for spraying invisibly thin antennas made from a type of two-dimensional metallic material called MXene - a conductive, two-dimensional titanium carbide material - which can be dissolved in water to create an ink or paint. They said the exceptional conductivity of the material enables it to be employed as an RF radiator even when applied in a very thin, nearly invisible coating. The MXene antennas perform as well as those now being used in mobile devices, wireless routers, and other devices, the Drexel researchers said. In addition, the MXene materials were shown to be 50 times better than graphene and 300 times better than silver ink antennas in terms of preserving the quality of RF transmission.

“Current fabrication methods of metals cannot make antennas thin enough and applicable to any surface, in spite of decades of research and development to improve the performance of metal antennas,” said Yury Gogotsi, director of the A.J. Drexel Nanomaterials Institute, who initiated and led the project PhD. “We were looking for two-dimensional nanomaterials, which have sheet thickness about 100,000 times thinner than a human hair; just a few atoms across, and can self-assemble into conductive films upon deposition on any surface. Therefore, we selected MXene as a candidate for ultra-thin antennas.”

“The MXene antenna not only outperformed the macro and micro world of metal antennas, we went beyond the performance of available nanomaterial antennas, while keeping the antenna thickness very low,” said Babak Anasori, a research assistant professor in the A.J. Drexel Nanomaterials Institute. “The thinnest antenna was as thin as 62 nanometers - about a thousand times thinner than a sheet of paper - and it was almost transparent.”

Unlike existing nanomaterial fabrication methods that require several steps, the Drexel research team’s spray-on antennas can be fabricated in a single step by airbrush spraying a water-based MXene ink, Anasori said. — *Thanks to DrexelNow (ARRL News)*

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### US ARDF Team Tops its Own World Championships Medal Count in Korea

Team USA took home 10 medals from the just-concluded 2018 Amateur Radio Direction Finding (ARDF) [World Championships](#), the highest medal count since the US team began participating in the international event 20 years ago. The 19th World ARDF Championships took place September 2 - 8 near the resort city of Sokcho in Korea's Gangwon Province. Hidden transmitters were scattered in forests encompassing 1,000 acres or more. The US has been represented at every ARDF World Championships event since 1988, with competitions taking place every 2 years.

On September 4, the first day of competition, the US won its first medal of this year as Ruth Bromer, WB4QZG, captured individual 3rd place in the W60 category in the 80-meter [foxoring](#) competition. The next day, the team’s M50 competitors - Vadim Afonkin, KB1RLI; Nicolai Mejevoi, and Bill Wright, WB6CMD - won bronze medals in the classic 2-meter team competition. That same day, the team of Ken Harker, WM5R — the Team USA Captain and the new International Amateur Radio Union (IARU) Region 2 ARDF Coordinator - and Joe Burkhead won bronze in the M40 category on 80 meters. Team awards are based on the aggregate scores of individual team members, who are not permitted to assist one another on the courses.

Afonkin took an individual gold medal for his 1st place finish on 80 meters in the M50 category. In the same event, the M50 category team of Afonkin, Mejevoi, and Wright came away with bronze medals in the 80-meter team competition.

This marked the second time that ARDF Team USA had competed in Korea. Before traveling to the competition, a [weekend training camp](#) for Team USA members and other ARDF enthusiasts took place August 10 - 12 at Mt. Pinos in the Los Padres National Forest of California.

[Complete results](#) of the 2018 ARDF World Championships are posted on the Deutscher Amateur Radio Club website. For more information on ARDF, visit the [Homing In](#) website of US/ARRL ARDF Coordinator Joe Moell, K0OV. [Follow ARDF Team USA](#) on Facebook. - *Thanks to Joe Moell, K0OV*

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### YLS Prep for Activation of Oklahoma's USS Batfish

NEIL/ANCHOR: A group of YLS plans to honor 2 submarines lost in World War Two and is looking for even more YLS to join them. Here’s Heather Embee, KB3TZD.

HEATHER: The USS Batfish Amateur Radio Club is getting ready to welcome a group of YLS on board the submarine in Oklahoma to call CQ as WW2SUB in October. The YLS will be honoring the

USS Wahoo and the USS Dorado which are among the 52 U.S. submarines lost during the Second World War. The lost subs are being honored by the Batfish's amateur club.

The YLs will be operating from Oct. 12th through the 14th, even sleeping on board and experiencing life on the submarine, which now houses an exhibit that honors military veterans and is permanently kept in Muskogee, Oklahoma's War Memorial Park.

The YLs aren't just looking for contacts and QSL cards - they're also in search of other YLs who'd like to join them on the air. Michelle Carey, W5MQC said that any YL who wants to join the operation that weekend should send an email to her at w 5 m q c at yahoo dot com (w5mqc@yahoo.com). Michelle said that the YLs will most likely be operating on 20 and 40 meters ' mostly SSB. According to club trustee Wade Harris KF5IF, although YLs have operated from the Batfish before, this is the first time for a group of YLs to do so as a formal event.

The weekend operation is being done under the auspices of the Young Ladies Radio League, the YLRL, where Michelle is District 5 representative, but any YL can participate regardless of whether she is a member of the league or not. Michelle also noted that any YL who does not yet have her license but is interested in experiencing what it's like to be on the air can also stop by and receive some guidance from a licensee.

She called the USS Batfish weekend operation "a unique opportunity for us to come together and help each other out while calling CQ and honoring those lost during World War Two." For more information about the Batfish radio club visit their website at w w two sub dot org (ww2sub.org)

For Amateur Radio Newslite, I'm Heather Embee, KB3TZD.