RCA Amateur Radio Club
Indianapolis, IN

www.w9rca.org

SEPTEMBER 2020 MONTHLY NEWSLETTER

A VIRTUAL ZOOM MEETING WILL BE SCHEDULED FOR
TUESDAY SEPTEMBER 8 AT 7:00 EDT
INVITATIONS TO JOIN WILL BE EMAILED BY SEPTEMBER 7

RCA ARC NEWS

THE SEPT 8th MEETING – For the September 8th meeting we shall again use a Zoom virtual meeting. The meeting will start at 7PM and is being hosted on the Indiana ARRL Section Zoom courtesy of the Indiana SCM Jimmy Merry, KC9RPX.

You will receive an email message with a link, meeting ID and password by September 7th. If you can access your emails by your smart phone, then you can join using it. If you join using your desktop or laptop and do not have a video camera, then it will join you with audio only assuming you have some type of microphone connected to the computer. If not, then you will be logged as listen only. You can also use your phone and call in using the numbers listed in the email for the session.

AUGUST MEETING SUMMARY – Thanks to all those who participated in the August Zoom meeting. Jim, K9RU, spoke a little about Field Day. The official debriefing meeting will be held this coming Thursday. The final score is expected to be announced. It'll be good! The new protocol for license testing seems to be working out pretty well. More work for the exam team however. The Virtual Hamfest over the past weekend was deemed a success and the presentations will be available online until Sept 9. The talks were reported to be quite good you might want to take a listen.

AMATEUR RADIO LICENSE TEST SESSION

Time: Saturday, Sept 12, 2020, Starting at 12:00 pm **by appointment only**.
(Registration, FRN, form NCVEC 605 filled out and a mask all will be required)
Location: Salvation Army EDS Training Facility, 4020 Georgetown Rd
Indianapolis, IN 46254-2407
Contact: **Jim Rinehart, k9ru@arrl.net, 317 721-1458**

HAMFESTS, OPERATING EVENTS, VOLUNTEER OPPORTUNITIES

Sept 12-13	WAE SSB Contest
Sept 12-13	ARRL EME contest
Sept 12-13	WAE Phone

Sept 13-14	ARRL VHF Contest
Sept 26-27	CQ WW DX RTTY
Oct 16-18	Jamboree on the Air
Nov 7	Hoosier Hills Hamfest, Bedford, IN
Nov 14-15	Ft Wayne Hamfest (Sunday Free)
July 9-10, 2021	Indianapolis Hamfest

For more information: http://www.indyhams.org/events

FCC PROPOSES TO REINSTATE AMATEUR RADIO SERVICE FEES

Amateur radio licensees would pay a $50 fee for each amateur radio license application if the FCC adopts rules it proposed this week. Included in the FCC's fee proposal are applications for new licenses, renewal and upgrades to existing licenses, and vanity call sign requests. Excluded are applications for administrative updates, such as changes of address, and annual regulatory fees.

The FCC proposal is contained in a *Notice of Proposed Rulemaking* (*NPRM*) in MD Docket 20-270, which was adopted to implement portions of the "Repack Airwaves Yielding Better Access for Users of Modern Services Act" of 2018 — the so-called "Ray Baum's Act."

The Act requires that the FCC switch from a Congressionally-mandated fee structure to a cost-based system of assessment. In its *NPRM*, the FCC proposed application fees for a broad range of services that use the FCC's Universal Licensing System (ULS), including the Amateur Radio Service that had been excluded by an earlier statute. The 2018 statute excludes the Amateur Service from annual regulatory fees, but not from application fees.

"Applications for personal licenses are mostly automated and do not have individualized staff costs for data input or review," the FCC said in its *NPRM*. "For these automated processes — new/major modifications, renewal, and minor modifications — we propose a nominal application fee of $50 due to automating the processes, routine ULS maintenance, and limited instances where staff input is required."

The same $50 fee would apply to all Amateur Service applications, including those for vanity call signs. "Although there is currently no fee for vanity call signs in the Amateur Radio Service, we find that such applications impose similar costs in aggregate on Commission resources as new applications and therefore propose a $50 fee," the FCC said.

The FCC is not proposing to charge for administrative updates, such as mailing address changes for amateur applications, and amateur radio will remain exempt from annual regulatory fees. "For administrative updates [and] modifications, which also are highly automated, we find that it is in the public interest to encourage licensees to update their [own] information without a charge," the FCC said.

The FCC also proposes to assess a $50 fee for individuals who want a printed copy of their license. "The Commission has proposed to eliminate these services — but to the extent the Commission does not do so, we propose a fee of $50 to cover the costs of these services," the FCC said.

The Ray Baum's Act does not exempt filing fees in the Amateur Radio Service. The FCC dropped assessment of fees for vanity call signs several years ago.

Deadlines for comments and reply comments will be determined once the *NPRM* appears in the *Federal Register*. File comments by using the FCC's Electronic Comment Filing System (ECFS), posting to MD Docket No. 20-270. This docket is already open for accepting comments even though deadlines have not yet been set.

FIRST ELEMENT OF ARISS NEXT-GENERATION RADIO SYSTEM INSTALLED AND OPERATING ON ISS

The initial element of the Amateur Radio on the International Space Station (ARISS) next-generation radio system has been installed onboard the ISS, and amateur radio operations using the new gear are now under way. The first element, dubbed the InterOperable Radio System (IORS), was installed in the ISS *Columbus* module. The IORS replaces the Ericsson radio system and packet module that were originally certified for spaceflight in mid-2000.

"Finally! It's been a scramble the last few days with coordination over the weekend and yesterday with astronaut Chris Cassidy, KF5KDR," ARISS-US Delegate for ARRL Rosalie White, K1STO, said. "But the new ARISS radio system is now installed, set up, and functioning. What a long road we've traveled over the past 5 years!"

Initial operation of the new radio system is in FM cross-band repeater mode using an uplink of 145.99 MHz (CTCSS 67 Hz) and a downlink of 437.800 MHz. System activation was first observed at 01:02 UTC on September 2. Special operations will continue to be announced, ARISS said.

The IORS was launched from Kennedy Space Center last March onboard the SpaceX CRS-20 resupply mission. It consists of a special, "space-modified" JVC-Kenwood D710GA transceiver, an ARISS-developed multi-voltage power supply, and interconnecting cables. The design, development, fabrication, testing, and launch of the first IORS was the culmination of a 5-year engineering effort by the ARISS hardware team of volunteers.

ARISS says the system "will enable new, exciting capabilities for ham radio operators, students, and the general public." Capabilities include a higher-power radio, voice repeater, digital packet radio (APRS) capabilities, and a Kenwood VC-H1 slow-scan television (SSTV) system.

A second IORS will undergo flight certification for later launch and installation in the Russian Service Module. The second system enables dual, simultaneous operations, such as voice repeater and APRS packet. It also provides on-orbit redundancy to ensure continuous operations in the event of an IORS component failure.

"Next-gen development efforts continue," ARISS said. "For the IORS, parts are being procured and a total of 10 systems are being fabricated to support flight, additional flight spares, ground testing, and astronaut training." Follow-on next-generation radio system elements include L-band repeater uplink capability — currently in development — and a flight Raspberry-Pi, dubbed "ARISS-Pi," that is just in the design phase. The ARISS-Pi promises operations autonomy and enhanced SSTV operations, ARISS explained.

ARISS this year marks 20 years of continuous amateur radio operations on the ISS. The largely volunteer organization welcomes donations to the ARISS program for next-generation hardware development, operation, education, and administration. – ARRL

RADIO AMATEUR TAKES PART IN HISTORIC FIRST COMMERCIAL HUMAN SPACEFLIGHT TO ISS

Bob Behnken, KE5GGX, was one of two NASA astronauts who made spaceflight history over the weekend. Behnken and Doug Hurley were the first astronauts since the 1970s to make a water

landing, after their Crew Dragon capsule splashed down in the Gulf of Mexico on Sunday. On May 30, the pair made history as the first live crew to be launched

into space in a commercial vehicle, for a stay on the International Space Station (ISS), marking the return of human spaceflight to US soil for the first time in nearly a decade.

A SpaceX Falcon 9 vehicle carried the crew into orbit from Cape Canaveral. The so-called "Demo-2" was the last major test for SpaceX's human spaceflight system, to be certified by NASA for operational crew missions to and from the ISS. Four huge parachutes carried the Crew Dragon capsule to a safe splashdown near Pensacola, Florida, on Sunday, August 1.

"On behalf of the SpaceX and NASA teams, welcome back to planet Earth," SpaceX Engineer Michael Heiman radioed to the crew after their landing. "And thanks for flying SpaceX."

NASA Administrator Jim Bridenstine proclaimed that the US was entering a new era of human spaceflight, noting that NASA was no longer the only option for US space travel. "We are going to be a customer," he said. NASA has contracted with two companies -- SpaceX and Boeing -- to ferry astronaut crews to and from the ISS.

While part of the space station crew for 2 months, Behnken and Astronaut Chris Cassidy, KF5KDR, the sole American onboard when their *Endeavour* capsule docked, carried out four spacewalks to install new batteries on the ISS.

The SpaceX Crew Dragon vehicle was designed for short-term missions, and Behnken and Hurley's mission had only been expected to last a week. As a result, Behnken did not receive Amateur Radio on the International Space Station (ARISS) training on the ISS ham radio gear so he could take part in school contacts.

IARU ANNOUNCES HF DIGITAL MODE BAND PLAN REVIEW

An International Amateur Radio Union (IARU) working group has been formed to develop solutions to reduce congestion within very popular mode segments while preventing mutual interference between "incompatible modes" as much as possible. The working group includes representatives of the three regional band-planning committees, marking the first time the three IARU regions have joined together to directly coordinate band-planning efforts.

"Because frequency allocations and amateur radio operating interests vary in different parts of the world, the development of band plans -- voluntary guidelines on the use of the spectrum that is available to radio amateurs -- is a responsibility of the three IARU regional organizations," the IARU explained in announcing the working group. "Each of the three regions has a band-planning committee to focus on this work."

The IARU says this approach to band planning has generally kept pace with the evolution of amateur radio operating, but the explosive growth in HF digital modes, particularly FT8, has led to perceived overcrowding of HF digital-mode band segments.

The new working group has already had fruitful discussions with the *WSJT* Development Group headed by Joe Taylor, K1JT. Additional discussions including other HF stakeholders will be held as part of a fundamental review of the different HF digital modes, and how they can best be categorized and arranged to share the limited spectrum available.

In recent years, moves have been made to bring the regional band plans into alignment wherever possible. Final approval of any band plan revisions typically occurs during regional conferences of IARU member-societies, held every 3 years on a rotating basis.

Due to recent administrative changes, however, revisions can be implemented without having to wait for the regional conferences.

TECHNOLOGY AND TECHNIQUE MAKING HAM RADIO TESTING POSSIBLE DURING PANDEMIC

Amateur radio license testing continues during the pandemic, with a combination of remote Volunteer Examiner (VE) test sessions and careful in-person session planning. In Hawaii, VE Team leader and Section Manager Joe Speroni, AH0A, said he and his team passed the 100-candidate mark on August 10 for video-supervised remote test sessions. Speroni said the most recent session administered exams to 10 candidates simultaneously.

"Candidates from all Hawaiian Islands, Puerto Rico, Guam, and US military bases in Okinawa have had an opportunity to sit for licenses," he told the ARRL Volunteer Examiner Coordinator. "The high pass rate of 95% is most likely due to candidates having had time to prepare for the exam." Speroni also said his VEs' willingness to contribute their time has made the program a success and available to a wide geographical range.

"Zoom meeting video lends itself to handling three candidates per session, and each requires three VEs," Speroni explained. "The 1:1 ratio of candidates to VEs makes planning important. Fortunately, the team of 15 VEs has volunteers from Oahu, Maui, the Big Island, California, and the Pacific. Often, hams from Okinawa and Guam are helping to license and upgrade hams in Hawaii."

The COVID-19 pandemic has affected licensing numbers as well as testing protocols. ARRL VEC Manager Maria Somma, AB1FM, reports that through the end of July, overall FCC license activity was down by 15% compared to the same period last year. New amateur licenses are down by 12% so far in 2020, with 15,849 new licensees compared to 17,947 in 2019. "Upgraded licenses are down by a staggering 23% -- 6,501 versus 4,984," Somma said. "The year-end prediction of 7,500 upgrades is much lower than in previous years, which have averaged around 9,500."

On the other side of the US, Rhode Island Section Manager and VE Bob Beaudet, W1YRC, reports his club, the Blackstone Valley Amateur Radio Club, conducted a "pandemic-compliant" open-air test session on August 8.

"Our governor in Rhode Island has directed citizens not to congregate in groups greater than 15 outdoors," Beaudet said, estimating that group size remained at around that number at any given time as candidates arrived and left. "Some came early and left as new people arrived," he said. "Also, we were rather widely spread out in the parking lot." Everyone wore masks and observed appropriate social distancing. The VEs grading and processing applications were also spread widely apart. "We planned to keep applicants a car width apart from one another, but many applicants came in rather large trucks," Beaudet recounted. "That changed our parking pattern a little."

The session accommodated one candidate who was severely vision impaired and successfully upgraded to a General-class license, with a VE reading the questions and recording his answers. *-- Thanks to Joe Speroni, AH0A, and Bob Beaudet, W1YRC*

BOARD OF DIRECTORS ELECTS NEW ARRL CEO DAVID MINSTER, NA2AA

The ARRL Board of Directors has elected David Minster, NA2AA, of Wayne, New Jersey, as ARRL's new Chief Executive Officer, starting on September 28. Minster is currently Managing Partner at Talentrian Partners, a management consulting firm serving the consumer goods and luxury goods industries.

Minster began his career as a software engineer, moving into management at Unilever, as a Chief Information Officer of this globally recognized portfolio of brands that includes Elizabeth Arden Company, Chesebrough-Ponds Canada, Thomas J. Lipton Co., and others. From there, he moved to fine jewelry manufacturer and retailer David Yurman, where he served as COO and CIO. More recently, Minster served as CEO of jewelry brands Scott Kay and Judith Ripka.

"Building a culture of accomplishment and accountability is what I do best," he said. "My initial focus will be working with the Board on establishing strategic goals and concrete plans to navigate ARRL through the digital transformation required for the coming decades of its Second Century. This includes exciting and innovative ways to be engaged in amateur radio, while growing activity and membership."

Minster got his Novice license, WB2MAE, in 1977, when he was in his teens. He progressed from Advanced to Amateur Extra and, after a stint as NW2D, he settled on the vanity call sign NA2AA in the 1990s as a way to honor a mentor, N2AA, and the contest station that he used to frequent, K2GL, in Tuxedo Park, New York.

Minster's ham radio pursuits have ranged far and wide over the years. His background includes National Traffic System training and participation in public service events, as well as contesting from home, club stations, and contest stations in the Caribbean -- particularly on Bonaire, where he is a member of PJ4G. Primarily a CW operator, Minster collects unique and vintage bugs and keys.

Minster earned a bachelor's degree in computer engineering from The Ohio State University and has a special interest in satellites, digital communications, remote operation, and ham radio computing and software. He has written keyer software for the commercial market, and contest logging, packet, and satellite telemetry software for personal use.

In addition to being an ARRL member, Minster is a member of AMSAT, the Frankford Radio Club, the Straight Key Century Club, CWops, and the North American QRP CW Club.

"I spend every day of my life, one way or another, engaged in amateur radio. It is more than just a hobby for me; it is my community. It is where I live; where I have built lifelong friendships, and friendships that span the globe. Amateur radio allows me to dream and to experiment. I can't wait to bring my energy and boundless enthusiasm in service to ARRL."

ARRL President Rick Roderick, K5UR, said, "We are excited to welcome David as our new CEO, and look forward to his progressive leadership. His experience in management and operations, plus his activities in amateur radio, will serve our organization and members well."

Minster will succeed Barry J. Shelley, N1VXY, who was CEO in 2018, and who has been serving as ARRL's Interim CEO since January 2020. Shelley had been ARRL's Chief Financial Officer since January 1992.

ARRL 2020 SIMULATED EMERGENCY TEST (SET) SCHEDULED FOR OCTOBER 3 - 4 WEEKEND

The 2020 ARRL Simulated Emergency Test (SET) will take place October 3 - 4. The annual, nationwide exercise provides Amateur Radio Emergency Service (ARES) volunteers the chance

to test personal emergency-operating skills and communication readiness in a simulated emergency deployment. ARRL is asking participants to adhere to Center for Disease Control (CDC) and local health department COVID-19 guidelines by staying home, maintaining safe distances when around people, and following recommended cleaning and disinfecting practices.

ARRL Field Organization leadership at the Section and local levels -- as well as many other volunteers who are active in public service and emergency communication -- are developing emergency scenarios with a variety of agencies and organizations they've partnered with in the past during real emergencies and disasters.

Given the ongoing pandemic, an in-person emergency exercise may not be possible this year, but volunteers are encouraged to adapt to the circumstances. Station and skills readiness are tenets of the Amateur Radio Service. Any time we spend on the air will contribute to developing and practicing our personal radio communication capability.

Volunteers with ARES, the National Traffic System (NTS), the Radio Amateur Civil Emergency Service (RACES), SKYWARN™, Community Emergency Response Team (CERT), Salvation Army Team Emergency Radio Network (SATERN), and other allied groups and public service-oriented amateur radio groups are among those eligible to participate in the SET to practice emergency operation plans, nets, and procedures.

ARRL has long-standing relationships with several national organizations including the American Red Cross, the National Weather Service, the Federal Emergency Management Agency, and the Salvation Army, among others.

This year's SET can be a chance to reach out to these partners -- at a safe distance and/or via online meetings and teleconferences -- to establish or review plans and develop working relationships.

ARRL Field Organization leaders have the option of conducting local or Section-wide SETs on dates other than the October 3 - 4 focal-point weekend, but no later than the end of the calendar year. Contact your local ARRL Emergency Coordinator or Net Manager or ask your Section Manager.

Additional information about SET and the reporting forms are available on the ARRL website.

ARECIBO OBSERVATORY REFLECTOR DISH DAMAGED WHEN CABLE SNAPS

An auxiliary cable that helps to support a metal platform above the Arecibo Observatory radio telescope's reflector dish in Puerto Rico snapped in the early morning hours of August 10, causing a 100-foot gash in the reflector dish. Operations at the world-famous observatory, which is managed by the University of Central Florida (UCF), have been halted until repairs can be made. When the 3-inch cable fell, it also damaged about a half-dozen panels in the Gregorian dome above the dish and twisted the platform used to access the dome. The cause of the cable break is not yet clear.

The main collecting dish at Arecibo is among the world's largest single-dish radio telescopes. The reflective dish is 1,000 feet in diameter, 167 feet deep, and covers an area of about 20 acres.

"We have a team of experts assessing the situation," Observatory Director Francisco Cordova said. "Our focus is assuring the safety of our staff, protecting the facilities and equipment, and restoring the facility to full operations as soon as possible, so it can continue to assist scientists around the world."

UCF manages the National Science Foundation (NSF) facility under a cooperative agreement with Universidad Ana G. Méndez and Yang Enterprises Inc.

Home to one of the most powerful telescopes on the planet, the facility is used by scientists around the world to conduct research in the areas of atmospheric sciences, planetary sciences, radio astronomy, and radar astronomy. Arecibo is also home to a team that runs the Planetary Radar Project supported by NASA's Near-Earth Object Observations Program in NASA's Planetary Defense Coordination Office, through a grant awarded to UCF.

The facility has endured many hurricanes, tropical storms, and earthquakes since it was built 50 years ago. Repairs from Hurricane Maria in 2017 are ongoing. Through it all, the facility has continued to contribute to significant breakthroughs in space research in the area of gravitational waves, asteroid characterization, planetary exploration, and more.

The largest single-dish radio telescope in the world for decades, Arecibo was bumped into second place in 2016 by the Five-hundred-meter Aperture Spherical Telescope (FAST) in China.

The Arecibo Observatory Radio Club operates KP4AO at the site, mostly on special occasions. -- *Thanks to UCF and other sources*

QSO TODAY VIRTUAL HAM EXPO TO BECOME TWICE-YEARLY EVENT

The QSO Today Virtual Ham Expo over the August 8 - 9 weekend appears to have been an unmitigated success, so much so that another virtual event will be held next March.

"It was far better than we expected," Virtual Ham Expo Dhair Eric Guth, 4Z1UG/WA6IGR, told ARRL. "We had over 26,000 registered and over 14,000 on the platform both days."

Guth said event sponsors and exhibitors that he's heard from so far "are thrilled with the turnout, engagement, and responses that they received." He said they're also enthusiastic about the second QSO Today Virtual Ham Expo, set for March 13 - 14, 2021. "Our plan is to offer this twice a year," Guth added.

The show, an ARRL-sanctioned event, was developed on the vFairs virtual conference platform, and cleverly re-created the atmosphere of a typical large hamfest, with several tracks of forum sessions on a wide array of topics. Those who had registered but did not log into the live event can see it all on demand until September 9.

"All of the services, except the chat, are running," Guth noted. "The doors are still open."

Dozens of video presentations are available to replay, including the keynote given by the Editor of ARL's *National Contest Journal,* Dr. Scott Wright, K0MD, "COVID-19: Amateur Radio's Impact on Problem Solving to Create a Global Response to the Pandemic." Presentations from other ARRL member-volunteers span technical and operating interests, including "Everything you need to know about Lithium Batteries" with Marcel Stieber, AI6MS, and an introduction to creating Arduino-based projects for home and ham radio, with Glen Popiel, KW5GP. Presentations highlighting young ham involvement and development include "Youth in Ham Radio," moderated by Carole Perry, WB2MGP, with six youth presenters.

Guth said a poll would be sent to determine what visitors enjoyed most. "However, my guess will be that the speakers were fantastic, along with the moderators for the live Q&A afterwards," he said. Exhibitors will also be polled for their post-show impressions.

Icom, a principal sponsor of the event, had team members from around the globe staff their exhibits. Icom America Senior Sales Manager Ray Novak, N9JA, said the event supported their new product launches including Icom's new IC-705 HF - 430 MHz all-mode 10-W transceiver, which just received FCC certification.

"We really enjoyed the virtual event," said Novak. "It is our goal to see this grow and to have hams from the various countries attend in anticipation of this becoming a multilingual event as we all are starving for ham radio events during this pandemic."

Kevin Zanjani, KI6DHQ, of Bioenno Power, also gave the virtual event high marks. The show, he said, "was quite exciting and a great platform to interact with customers and the entire ham radio community during these times." Bioenno Power, based in Southern California, is a provider of Lithium-Polymer (LiPo) batteries and solar-power devices. Zanjani said the chatroom was very effective to engage with customers. "Many also dropped by to say hello as well, so we found that nice."

Icom, a principal sponsor for the event, had team members from around the globe staff their exhibits -- including representatives from the US, Japan, and Europe. Icom America Senior Sales Manager Ray Novak, N9JA, said the event supported their new product launches, including Icom's new IC-705 HF - 430 MHz all-mode 10 W transceiver, which received FCC certifications a few days before the event opening. "We really enjoyed the virtual event," said Novak. "It is our goal to see this grow and to have hams from the various countries attend in anticipation of this becoming a multilingual event, as we are all starving for ham radio events during this pandemic."

Product Development Manager Bob Inderbitzen, NQ1R, was among the ARRL representatives engaging with event attendees using text and video chat. He described the experience as having some similarities and some differences from an in-person convention.

"Our team answered questions about ARRL membership programs and services, amateur radio licensing, and even had some fun challenging visitors to our booth with ham radio trivia," he said. Physically located at ARRL Headquarters in Newington, Connecticut, Inderbitzen treated more than 500 visitors to live, online tours from inside Hiram Percy Maxim Memorial Station W1AW.

"It was fun to see a screen full of smiling faces, and to answer questions in real time. The experience had an on-air feel," Inderbitzen said. A short welcome video greeted visitors at the ARRL booth.

Guth said the organizers' challenge going forward is to reduce the workflow in putting the show together. "But all in all, it was a lot of work, I have a great team, the volunteer speakers and moderators were out of this world, and I am grateful to our sponsors and exhibitors for footing the bill," he added. Read more.

GERMAN SATELLITE DEMONSTRATES ORBIT CONTROL ON A 1U CUBESAT

The University of Wuerzburg Experimental Satellite 4 (UWE-4) successfully used its propulsion system in order to conduct orbit control. The 1-unit (1U) CubeSat is equipped with an electric propulsion system called NanoFEEP, developed by the Technical University in Dresden. This marks the first time in CubeSat history that a 1U CubeSat has changed its orbit using an onboard propulsion system. Several maneuvers were performed within 11 days, between June 23 and July 3, lowering the CubeSat's altitude by more than 100 meters (328 feet), compared to an average of 21 meters (69 feet) with natural orbital decay.

Coincidentally, on July 2, the UWE-4 team received a "conjunction data message" from the US Air Force, indicating a potential safety threat from a non-operational Iridium satellite, although UWE-4 was already below the Iridium satellite at the projected time of conjunction.

Lowering the altitude of a spacecraft in low-Earth orbit (LEO) has the negative effect of reducing its lifetime, because low-Earth-orbiting (LEO) satellites usually burn up during re-entry. "Thus, this experiment is a concept demonstration of a deorbiting maneuver shown at the smallest class of spacecraft in LEO," the university said.

While satellites are not yet required to carry propulsion systems to facilitate a planned deorbiting, such an obligation is under serious discussion, due to the vastly increasing number of satellites in mega constellations. "The experiment of UWE-4 presents a deorbiting solution for the fraction of space debris of operational, but unused, satellites of today and for the mega constellations of tomorrow," the university said. AMSAT notes that US regulations make the ability to deorbit a requirement for high-Earth-orbit amateur satellites in the future.

The first activation of the NanoFEEP thruster on UWE-4 took place in early 2019. UWE-4 transmits telemetry on 435.600 MHz.

HAM-ASTRONAUTS TO CREW BOEING, SPACEX COMMERCIAL MISSIONS FOR NASA

Ham-astronauts abound among crew members assigned to pioneering commercial space missions by Boeing and SpaceX. Jeanette Epps, KF5QNU, is the latest astronaut assigned to the Boeing Starliner-1, a four-passenger vehicle that will undertake its first mission to the International Space Station (ISS) in 2021. Others on the crew will include veteran Sunita Williams, KD5PLB, and Josh Cassada, KI5CRH. Another crew member is yet to be named.

Epps, Williams, and Cassada will spend 6 months on the ISS. The flight will follow NASA certification after a successful uncrewed Orbital Flight Test-2 and Crew Flight Test with astronauts. The spaceflight will be the first for Epps and Cassada and the third for Williams, who spent long-duration tours on the ISS for Expeditions 14/15 and 32/33. NASA assigned Williams and Cassada to the Starliner-1 mission in August 2018.

Jeanette Epps, KF5QNU. [NASA, photo]

Four veteran astronauts are preparing to launch this fall on the SpaceX Crew 1 mission. They are Victor Glover, KI5BKC; Mike Hopkins, KF5LJG; Shannon Walker, KD5DXB, and Soichi Noguchi, KD5TVP, of the Japan Aerospace Exploration Agency (JAXA).

Boeing Starliner 1 crew members Josh Cassada, KI5CRH, and Sunita Williams, KD5PLB.

NASA and SpaceX are targeting no earlier than October 23 for the first operational flight with astronauts of the Crew Dragon spacecraft and Falcon 9 rocket as part of the agency's Commercial Crew Program. The SpaceX Crew-1 mission will be the first regular rotational mission to the space station following completion of NASA certification.

Astronauts Bob Behnken, KE5GGX, and Doug Hurley traveled to the ISS on a SpaceX Crew Dragon in late May, marking the first time that humans traveled aloft via a commercial spacecraft.

NASA's Commercial Crew Program is working with the US

NASA's SpaceX Crew-1 crew members in the company's Crew Dragon spacecraft during training. From left to right: Shannon Walker, KD5DXB; Victor Glover, KI5BKC; Mike Hopkins, KF5LJG, and Soichi Noguchi, KD5TVP. [SpaceX, photo]

aerospace industry as companies develop and operate a new generation of spacecraft and launch systems capable of carrying crews to low-Earth orbit and to the space station. Commercial transportation to and from the station will provide expanded utility, additional research time, and broader opportunities for discovery on the orbital outpost, NASA says.

"As commercial companies focus on providing human transportation services to and from low-Earth orbit, NASA will concentrate its focus on building spacecraft and rockets for deep-space missions," the space agency said.

Some of the ham-astronauts will be available for ham radio contacts from the ISS with schools and educational groups via the Amateur Radio on the International Space Station (ARISS) program.

SOLAR MINIMUM MOST LIKELY OCCURRED IN DECEMBER 2019

Sunspot Index and Long-Term Solar Observations (SILSO) in Belgium said this month that the minimum between Solar Cycles 24 and 25 “most probably” took place last December. SILSO, a part of the Royal Observatory of Belgium and formerly known as SIDC, cited as evidence the January 2020 increase in the 13-month smoothed sunspot number — the first upswing since the Cycle 24 maximum in April 2014.

“[F]or now, this latest smoothed value in January 2020 is the very first point indicating a rise of the activity. So, the date of the minimum still needs a full confirmation over the coming months,” SILSO said on its website. “For now, preliminary smoothed values, limited to less than 13 months, hint at increasing values over coming months. If the rising trend indeed continues, this [December 2019] date will become fully definitive.”

SILSO said another indication of the transition between the two solar cycles can be drawn from counting individual sunspot groups that belong to either the old or new solar cycle. “While most sunspot groups belonged to the last solar cycle [Cycle 24] until September 2019, the dominance switched to groups of the new cycle in November 2019,” SILSO said.

SILSO said that in terms of the number of active regions, the minimum between Cycle 24 and Cycle 25 falls in October 2019. “This is close to December 2019,” SILSO said. It attributes the difference to three factors:

- The sunspot number also takes into account the total number of spots, and thus the size of the emerging active regions.
- The time of the minimum depends on the respective trends of the declining phase of the past cycle, and of the rising phase of the new cycles, over the 12 months surrounding the minimum.
- The date of the minimum has a significant uncertainty range. Near minimum the activity hardly varies and is close to minimum during a few months. “The date of the minimum is thus always less sharply defined than the date of the maximum of the cycles, which are more sharply peaked,” SILSO explained.
- “This late-breaking upward trend is now expected to accelerate over the coming months,” SILSO predicted. “So be prepared for a more eruptive and interesting sun!”

SILSO is preserving the longest record of solar activity, which spans the last 4 centuries.

US DEPARTMENT OF DEFENSE TO SHARE 3450 - 3550 MHZ WITH 5G COMMERCIAL OPERATIONS

The FCC will auction sharing rights to the upper 50 MHz of the 3300 - 3500 MHz secondary amateur radio allocation to commercial 5G interests in the wake of the Department of Defense (DoD) agreement to share spectrum at 3450 - 3550 MHz. The entire band currently supports a variety of military operations, and amateur radio has a long history of peaceful coexistence with the Department of Defense as a secondary user of this spectrum.

Late last year, the FCC proposed to delete the amateur 3300 - 3500 MHz secondary allocation as well as the amateur-satellite allocation at 3400 - 3410 MHz. The FCC could auction the 100 MHz of spectrum in early 2022. This latest move makes a contiguous band of spectrum from 3450 - 3980 MHz available for commercial 5G networks.

"For a number of years, the National Telecommunications and Information Administration (NTIA) and FCC have focused on the 3450 - 3550 MHz band as the spectrum most conducive to sharing with commercial users," said ARRL Washington Counsel David Siddall, K3ZJ. "Monday's statements announced that a framework for sharing has been worked out."

In December 2019, the FCC adopted a *Notice of Proposed Rulemaking* (*NPRM*) in WT Docket 19-348 proposing to delete the 3300 - 3500 MHz secondary amateur band. ARRL strongly opposed the move in its comments on the *NPRM*, which put forward the FCC's plans to remove "existing non-federal secondary radiolocation and amateur allocations" in the 3300 - 3500 MHz band and to consider options for relocating incumbent non-federal operations.

Siddall said the spectrum below 3450 MHz presents a more difficult government/commercial sharing scenario, and that future sharing there remains uncertain. "We continue to argue that the amateur secondary allocation should not be deleted in this band," he said. "We recognize

that our access is secondary, and ask only to be given a chance to use our considerable technical skills to work around whatever future uses may be implemented in this spectrum."

"Together with the spectrum being made available for 5G in the C-band as well as the 3.5 GHz band, we are now on track to have a 530-megahertz swath of mid-band spectrum available for 5G from 3.45 to 3.98 GHz," FCC Chairman Ajit Pai said in a statement. "The FCC looks forward to moving quickly to adopt service rules for the 3.45 GHz band and then hold an auction to bring this prime mid-band spectrum to market." Read more.

SHORTS

The Japan Telecommunications Ministry (MIC) announced that effective August 20 all stations permitted to transmit on Japan's 160-meter allocation may now use SSB. The current Japan Amateur Radio League (JARL) band plan suggests 1848 - 1875 kHz carrier frequency for LSB. -- *Thanks to Kenji Rikitake, JJ1BDX/N6BDX*

The Antique Wireless Association (AWA) 2020 Virtual Conference presentations are available on YouTube. New videos will be added daily through August 14. -- *Thanks to Mark Erdle, AE2EA*

The Russia-Ukraine "radio war" and the Russian over-the-horizon radar (OTHR) "Contayner" were the most frequently reported amateur band intruders during July, according to the International Amateur Radio Union Monitoring System (IARUMS). IARUMS characterized the ongoing broadcast radio war transmissions between the neighboring nations as "spiteful and provocative." Clandestine stations have appeared on 7.055, 7.090, and 7.110 MHz.

IARUMS has determined that the heavy harmful interference from the Contayner Russian OTHR is coming from a location east of Moscow. Contayner OTHR signals have been monitored on various frequencies on 40, 20, and 15 meters, with a typical occupied bandwidth of about 12 kHz.

"Sometimes, we also found the 20 kHz wide OTHR from the UK base in Cyprus, but less than in previous years," reported IARUMS Region 1

Coordinator Peter Jost, HB9CET, in the July newsletter. "Due to some band openings at 10 meters, some of us [also] heard several driftnet fishing buoys."

Owing to vagaries in ITU *Radio Regulations* footnotes that relate to amateur radio frequencies, however, not every signal classified as an intruder is actually an intruder. It could be a signal that complies with the regulations, Jost pointed out to readers.

"The numerous footnotes of the ITU *Radio Regulations* must always be taken into account," Jost said. "For example, the 14,250 - 14,350 kHz range is primarily assigned to the fixed service in some countries. Since we cannot determine the origin of signals with absolute certainty, they are usually recorded as intruders, even if there is the possibility of an exception, due to a footnote."

The latest IARU-R1 Monitoring System newsletter includes reports from German radio amateurs on the large number of fishery buoys operating on 10 meters, where amateur radio is primary.

THANKS FOR READING !

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