RCA AMATEUR RADIO CLUB

AFFILIATED CLUB

INDIANAPOLIS, INDIANA

MEMBER

JULY, 2015 MONTHLY NEWSLETTER

THE NEXT MEETING OF THE RCA AMATEUR RADIO CLUB WILL BE
TUESDAY, JULY 14th, 6:30 PM AT G.T. SOUTH'S,
5711 E. 71st STREET, INDIANAPOLIS, IN

INDIANAPOLIS HAMFEST, SATURDAY, JULY 11, 6AM TO 3PM,

MARION COUNTY FAIR GROUNDS

RCA ARC NEWS

SUMMARY OF THE JUNE MEETING – Thanks to all who attended the June meeting. We discussed the status of the eight tables we've bought for the Indy hamfest. Jon, KC9GUM, reported he has lots of stuff to sell. We'll need help loading stuff on Friday afternoon before the hamfest. Meet at K9RU's QTH about 3PM. We could use another pickup truck. Field Day setup will start approx 10AM on Saturday. The IRC will be emailing information about equipment, scheduling, etc. Dave, N9KZJ, reported the USS Indianapolis station worked 500-600 QSOs, 38 ships on Ships Weekend. Jim, AF9A, brought the new Yaesu Fusion repeater for everyone to take a look at.

HELP NEEDED AT INDY HAMFEST MANNING THE RCA ARC FLEA MARKET TABLES – We will need help loading and moving our stuff to the Hamfest Friday afternoon (July 10th) and evening. We will start loading at K9RU home, 1455 Shannon Ave, Indianapolis, IN at 3PM. We should be at the Marion County Fair Grounds, 7300 East Troy Ave. to unload around 5PM.

Help will be needed to man the tables starting at 6 AM Saturday thru noon. We will need some help moving the remaining stuff back to K9RU's home after the hamfest. – K9RU

EQUIPMENT FROM DAVE BROWN'S ESTATE – The following items were Dave Brown's, W9CGI SK. These, as well as some power supplies and other miscellaneous items will be available for sale at the RCA ARC booth at the Indy Hamfest. The price is the asking price and it is negotiable. If you are interested, you can e-mail K9RU k9ru@arrl.net or come early on Saturday.

They are in very good shape, with manuals, but no boxes.

Yaesu FT-990 -- $550 100W, 10 - 160M includes the desk mic and external speaker.
Yaesu FT-726R --- $350 6M, 2M & 440 MHz, 10W, SSB, FM & CW.
Yaesu FT-2800 -- $60 50W, 2M FM
Yaesu FT-857D -- $475, 100W 160M – 6M, 50W 2M & 20W 440MHz, SSB, CW & FM includes power supply and boom mic headset (No separation kit)
Yaesu FT-8900 -- $350 Quad Band FM, 10M, 6M, 2M, & 440MHz
Alinco DX-70 -- $350 SSB/CW 6M - 160M, 100W includes power supply.
Yaesu VX-5 -- $100, includes charger

Yaesu VR-500 -- $100, general coverage HT receiver
Wouxun KG-UV-920P -- $200, 2m/440 FM dual band with remote control and cross band capability.
LGC AT-100 Pro $125, Automatic antenna tuner
Buddi Dipole -- $100, portable HF dipole

ARRL FIELD DAY AT CAMP BELZER – This year Field Day was a joint effort with Indiana Radio Club, Indianapolis Motor Speedway ARC, Hoosier DX and Contest Club and the RCA ARC.

We ran a 3A setup with two Phone and a CW HF station also a GOTA HF station and 6 meter VHF station.

The CW station operated from K9DC's RV, the GOTA station was located in the field between the Phone and CW stations. The Phone and VHF occupied a shelter house.

Over the years the RCA ARC has run in 1A and since joining in with the IRC we moved up to 2A. This is the first 3A we have attempted and it worked out well.

A lot of the credit goes to WY9T, Bill Kennedy who did the scheduling. The additional manpower for 3A was a concern, but Bill's e-mails encouraging everyone to sign up for a time slot worked.

I don't have the totals, but I think we did 2800 QSOs. All the equipment work as planned and the weather was nice, but a little cool in the evening.

Tom Chance, K9XV gets a lot of credit for organizing all the equipment and thanks to Jim Keeth, AF9A for the use of his Honda generator and of his Pro II.

Pictures of FD will be posted to the w9rca.org website. -- Jim K9RU

NEXT TEST AMATEUR RADIO LICENSE TEST SESSION – The next scheduled RCA/IRC test session:

Time: Saturday, July 11th, 9:00AM
Location: Indianapolis Hamfest, Marion County Fairgrounds
Contact: Rhonda S. Curtis, (317) 363-7457, Email: ws9h@arrl.net

HAMFESTS, OPERATING EVENTS, VOLUNTEER OPPORTUNITIES

July 11 Indy Hamfest, Marion Co. Fairgrounds, http://indyhamfest.com

THE AMATEUR RADIO PARITY ACT OF 2015 INTRODUCED IN THE US SENATE

A companion Amateur Radio Parity Act of 2015 bill has been introduced in the US Senate. Mississippi Republican Sen Roger Wicker introduced S. 1685 on June 25, with Connecticut Democratic Sen Richard Blumenthal as the initial cosponsor. The Senate bill joins an identical measure in the US House, H.R. 1301, which was introduced in March by Illinois Republican Rep Adam Kinzinger. Both measures would direct the FCC to extend its rules relating to reasonable accommodation of Amateur Service communications to private land-use restrictions.

"Introduction of the Senate bill is a huge step toward achieving fairness for amateurs affected by private land-use regulation," said ARRL President Kay Craigie, N3KN. "For them and for the future of Amateur Radio, I thank everyone who contributed to making this progress. Now let's finish the job!"

Wicker said the bill he introduced with Blumenthal's cosponsorship would allow for transparency and equality in the regulatory process. He said in a June 29 media release that the legislation would ensure that Amateur Radio operators are able to continue to provide "critical communications support at no cost to taxpayers.

"This would be particularly beneficial in Mississippi and other rural states," Wicker said. "During Hurricane Katrina, Mississippians learned firsthand the value of Amateur Radio, and its ability to provide information that could save lives in times of natural disasters."

According to Wicker, the measure "ensures increased access to, and availability of, critical resources and communication tools" to first responders. Added Blumenthal, "We have seen the effectiveness of these systems, and the need to provide these emergency response systems to Americans, regardless of where you live, is evident."

Wicker pointed out that private land-use restrictions prevent many hams from installing functional outdoor antennas. "This bill would call on FCC to apply the reasonable accommodation policy evenly to all types of residential land-use regulations and offer Amateur Radio operators the ability to negotiate with subdivisions that now have restrictions that preclude Amateur Radio antennas completely," he said. "This could be accomplished without taking any jurisdiction away from homeowners associations and would protect neighborhood aesthetics."

S. 1685 has been referred to the US Senate Committee on Commerce, Science, and Transportation, chaired by Sen John Thune (R-SD).

The House version of The Amateur Radio Parity Act of 2015 had attracted support from 83 cosponsors, as of July 1. --ARRL Letter

FCC INVITES COMMENTS ON PROPOSED RULES FOR NEW LF AND MF AMATEUR ALLOCATIONS

The FCC is inviting comments on its recent proposals to authorize Amateur Radio operation on two new bands -- an LF allocation at 135.7 to 137.8 kHz (2200 meters), and an MF allocation at 472-479 kHz (630 meters). Amateur Radio would be secondary on both bands. Comments are due August 31. Reply comments -- ie, comments on comments filed -- are due by September 30. The FCC allocated 135.7 to 137.8 kHz to the Amateur Service in accordance with the *Final Acts* of the 2007 World Radiocommunication Conference (WRC-07). The proposed new allocation at 472 to 479 kHz would implement decisions made at WRC-12.

"The Commission is proposing service rules for the Amateur Service in the 135.7-137.8 kHz and 472-479 kHz bands with the principal goal of enabling sharing of this spectrum among licensed amateur stations and unlicensed PLC systems," the FCC said on April 27 in a 257-page Report and Order, Order, and Notice of Proposed Rulemaking. The combined proceeding addresses three dockets -- ET-12-338, ET-15-99, and IB-06-123 -- affecting various radio services in addition to the Amateur Service. The detailed proposals appeared in *The Federal Register* on July 2.

Amateur Radio would not be permitted in either band until the FCC determines, on the basis of comments, the specific technical and operational Part 97 rules it must develop. Amateur Radio would share both allocations with unlicensed Part 15 power line carrier (PLC) systems operated by utilities to control the power grid, as well as with other users.

With respect to the new 630 meter band, the FCC has concluded that Amateur Radio and PLC systems "can successfully coexist in the band," and noted that there has been no reported interference to PLC operation resulting from experimental operations there. The FCC said PLC systems and anticipated Amateur Radio use of both 630 meters and 2200 meters "have characteristics that make coexistence possible." In general, the FCC wants to hear from the public regarding power limits, antenna placement and height, and geographical limitations for operation in the proposed LF and MF allocations. The FCC has said that the "cornerstone" of the technical rules it's proposing for both bands is "physical separation between amateur stations and the transmission lines" carrying PLC signals.

The FCC has said that if it concludes, after considering the record, that Amateur Radio and PLC systems cannot coexist on 135.7-137.8 kHz, it would "defer the adoption of service rules, and amateur users will have to continue to use the experimental licensing process to operate in the band."

In 2012, the ARRL submitted a *Petition for Rule Making* asking the FCC to allocate 472-479 kHz to the Amateur Service on a secondary basis and to amend the Part 97 rules to provide for its use. Several countries, including Canada, already have access to the band.

The FCC said the addition of the new LF and MF allocations "would provide new opportunities for amateur operators to experiment with equipment, techniques, antennas, and propagation phenomena but with signals having larger bandwidth and higher power."

In addition, the FCC has raised the secondary Amateur Service allocation at 1900 to 2000 kHz to primary, while providing for continued use by currently unlicensed commercial fishing vessels of radio buoys on the "open sea." The Commission is seeking comment on technical requirements to govern operation of the Part 80 radio buoys.

Interested parties may submit comments, identified by ET Docket No 15-99, via the FCC Electronic Comment Filing System (ECFS). The ARRL will file comments in this proceeding. --ARRL Letter

FCC SPEEDILY DISMISSES PETITIONS TO ALTER AMATEUR SERVICE RULES

Acting with near lightning speed, the FCC has dismissed two petitions for rule making calling for separate amendments to the Part 97 Amateur Service rules. Willison H. Gormly, WD0BCS, of Des Moines, New Mexico, filed both petitions on June 16, and the FCC turned them away on July 1. Gormly had requested that the FCC amend §97.301(e) of the rules by dividing it into separate sub-paragraphs for technician and Novice class privileges. He had also asked the FCC to amend §97.305(c) to authorize spread spectrum emissions in the 2 meter band.

"The rule changes you propose were previously rejected by the Commission," Scot Stone, deputy chief of the Mobility Division in the Wireless Telecommunications Bureau, told Gormly in the FCC's dismissal letter. "Your petitions do not demonstrate or even suggest that any relevant circumstances have changed such as to merit reconsideration of these decisions."

The FCC noted that while §97.301(e) had been divided into two paragraphs in the past, these were consolidated when the Commission streamlined the rules in 1999. Gormly argued that the present configuration was confusing, but the FCC pointed out that §97.301 "has been in this arrangement for a number of years without any reported difficulty."

Regarding Gormly's second petition, the Commission noted that it had sought comment in 2004 as to whether it should expand the bands authorized for spread spectrum to permit such emissions on the 50 MHz, 144 MHz, and 222 MHz bands. Agreeing with the majority of comments, the FCC subsequently determined that authorizing spread spectrum was not warranted on 6 meters and 2 meters, "because of concerns over the compatibility of spread spectrum emission types and other Amateur Radio operations in those bands," the FCC explained in its denial letter. Read more. --ARRL Letter

PATTERN OF CQ WW CONTACT PADDING PROMPTS DISQUALIFICATIONS, REVIEW OF PAST CONTEST LOGS

The CQ World Wide Contest Committee said on June 25 that it plans to review all past CQ WW contest logs, after its investigation revealed a pattern of routine QSO padding on the part of one top-scoring CQ WW participant. This follows in the wake of the disqualifications of some two dozen 2014 CQ WW SSB contest operators in April, and another 30 contestants in the 2014 CQ WW CW event. Among the latter group of DQs was the TO7A entry of Dmitry V. Stashuk, UT5UGR, of Kiev, Ukraine, for unclaimed use of assistance. TO7A had claimed the top Single Operator, High Power score.

"During the public discussion around this disqualification, a section of the log on 160 meters was pointed out as being suspicious," the committee said. "Further checking revealed a run of 47 QSOs that were added to the log when TO7A could not be detected

on the air by RBN [Reverse Beacon Network] or SDR recordings. In total, as many as 123 QSOs representing 22 additional multipliers were padded into the log." The CQ WW Contest Committee said the "particular pattern" of the suspicious contacts made it clear that they were added deliberately after the contest to fill in rest or break periods.

The contest committee subsequently decided to dig more deeply into past contest logs submitted by UT5UGR, many of them competitive entries, including one for a record continental score, and it uncovered evidence of log padding going back to 2008, when UT5UGR placed third in the world in the Single Operator, High Power category from V31WA in the CQ WW CW.

As a result, *CQ* has disqualified UT5UGR's entries in which they detected log padding and removed them from the official score database. In addition, any entry into a *CQ*-sponsored contest until July 2020 in which UT5UGR is the operator or listed as a participant will be reclassified as a checklog.

"This violation of the trust that underlies radiosport competition cannot be ignored," *CQ* said. The CQ WW Contest Committee has announced that new log checking processes were being developed to improve the detection of log padding. "We intend to test these methods against all submitted logs from 2011-2014. If other entries are found to have added unverifiable QSOs, we will address them on a case by case basis," *CQ* said.

Stashuk did not respond to an ARRL e-mail seeking comment. Read more.

CEDAR CONFERENCE PARTICIPANTS DIG INTO SCIENCE OF INTEREST TO RADIO AMATEURS

It was a meeting of the minds as more than 300 scientists -- many of them radio amateurs -- met at the University of Washington in Seattle during the week of June 21 for the annual National Science Foundation-sponsored Coupling, Energetics, and Dynamics of Atmospheric Regions (CEDAR) Conference. CEDAR is a broad-based, community-guided upper-atmosphere research program. The program focuses on the science of atmospheric regions from the middle atmosphere (~30 km altitude) through space. This region includes the ionosphere, and the CEDAR workshop discussed issues highly relevant to Amateur Radio HF propagation.

"The middle atmosphere is particularly difficult to study, as it is generally too high for sounding rockets and balloons, and too low for most satellites," explained Nathaniel Frissell, W2NAF, a graduate student at Virginia Tech who attended the CEDAR workshop. "Thus, it is difficult to make in-situ measurements, and remote sensing techniques are very important." Frissell said it's also very difficult, because of its size, to take sufficient measurements that truly characterize the whole Earth-space system.

Noteworthy topics at the CEDAR workshop included ionospheric and neutral atmospheric response to geomagnetic storms and space weather, atmospheric gravity waves and traveling ionospheric disturbances, and the coupling of the ionosphere and middle atmosphere to space. Frissell delivered a presentation, "Using Amateur Radio Signals with the CARINA Satellite," during the conference, in collaboration with Magda Moses, KM4EGE, a Virginia Tech undergraduate; Ethan Miller, K8GU, of JHU/APL; Steve Kaeppler, AD0AE, of SRI, and the Reverse Beacon Network (RBN). Frissell said his presentation prompted the recent experiment that had the Canadian CASSIOPE satellite listen for Field Day signals.

Scientists on hand at the CEDAR event represented many major ionospheric and upper-atmosphere research programs.

Moses' workshop poster presentation, "Experiment Design to Assess Ionospheric Perturbations During a Solar Eclipse," discussed how solar eclipses offer an opportunity to determine the dependence of the ionosphere on sunlight. She is working with her advisor, Gregory Earle, W4GDE, and Frissell. A total solar eclipse will occur over the US in August 2017. Moses' plan is to observe whether unique ionospheric responses may be witnessed during an eclipse. "This will be accomplished using a nationwide network of GPS receivers as well as coherent scatter radars and a variety of techniques involving

Amateur Radio," her poster explained. The experiment would make use of the RBN and involve an Eclipse QSO Party.

"These conferences are extremely important, because the only way we have a chance at gaining understanding of the Earth-space system is to have the entire scientific community work together to identify strategies for making progress," Frissell said. He noted that many CEDAR talks were about building networks of instruments and sharing data to tackle problems of common interest. "This is one reason I think using the RBN -- and similar networks -- is important," he said, "because they provide a global view that complements other observational techniques." Read more. --Nathaniel Frissell, W2NAF, ARRL Letter

NEW WORLD DISTANCE RECORDS SET ON 2.3 AND 3.4 GHZ HAM BANDS

Two California radio amateurs -- one of them in Hawaii -- have set new world distance records on the 2.3 and 3.4 GHz microwave amateur bands. Wayne Overbeck, N6NB, operating from a radio-equipped rental car on the Big Island of Hawaii, worked Gregory Campbell, W6IT, operating from Overbeck's own fixed station near Orange, California, on both bands -- a distance of more than 4024 km (2495 miles). The contacts blew away records that had stood for more than 20 years, and more than doubled the previous distance records for a two-way voice (SSB) contact at those frequencies, Overbeck said, adding that most previous microwave distance records have been set using CW.

"Ours was the first-ever SSB contact between Hawaii and the mainland on 2304," Overbeck noted. He said Chip Angle, N6CA, and KH6HME (SK) made the first transpacific SSB contact on 3.4 GHz in the 1990s.

The record-setting contacts occurred on June 19 (June 18 in Hawaii) on 2.3 GHz at 0257 UTC and at on 3.4 GHz at 0300 UTC. W6IT was in grid square DM13cs, while N6NB/KH6 was in BK29hq. According to the database of distance records maintained by Al Ward, W5LUA, the old records were 3982 km, set on by N6CA and KH6ME on July 14, 1994, on 2.3 GHz (CW) and on July 28, 1991, on 3.4 GHz (SSB).

Overbeck flew to Hawaii carrying gear for all bands from 144 MHz through 10 GHz "in two large suitcases, plus a roll-aboard and a backpack" -- weighing about 150 pounds in all. In Hawaii, he rented a small SUV and built a rover-style station that included a rotating roof platform, constructed using parts obtained from a home improvement store.

Overbeck said that when a tropospheric duct formed that could convey signals thousands of miles across the Pacific, he drove around the slopes of Mauna Loa -- 13,000 feet up --and selected several promising sites for long-haul DX, "not necessarily the highest possible sites," he added. "By Thursday, June 18, the duct seemed to be peaking," he said.

W6IT activated N6NB's fixed station and quickly worked N6NB/KH6 on six bands, including 2304 and 3456 MHz for world records. Overbeck said he also heard W6IT on 902 MHz and 5.7 GHz, but local, non-amateur interference in California -- likely from Part 15 Wi-Fi devices -- prevented W6IT from hearing N6NB/KH6 on those bands.

A video of the record-setting 2304 GHz contact between N6NB/KH6 and W6IT (recorded from the Hawaii end of the circuit) is online. --ARRL Letter

AMATEUR RADIO BECOMES PRIMARY ON 1900 – 2000 KHz on August 6th

Amateur Radio will be upgraded on August 6 from secondary to primary in the 1900-2000 kHz segment of 160 meters in the US. That's the effective date of theWRC-07 implementation *Report and Order* and WRC-12 *Order* portions of a lengthy FCC document released on April 27. Both **portions** appeared on July 7 in the *Federal Register*; the *Notice of Proposed Rule Making* (*NPRM*) of the same proceeding was published in the *Federal Register* on July 2. The FCC also made a secondary allocation of 135.7-137.8 kHz to the Amateur Service, but this band will not be available until service rules have been adopted.

"The FCC action with respect to 1900-2000 kHz reduces the possibility that we might suffer in the future from new radiolocation deployments," said ARRL CEO David Sumner, K1ZZ. "On the other hand, we will have to put up with radio buoys that have been operating illegally in the band but that now have been 'regularized' by the Commission."

The FCC said that while it had believed there was no non-Federal RLS use of the 1900-2000 kHz band, the record indicated there are maritime users, including the US "high seas" migratory species fishing fleets, making use of radio buoys in the Atlantic and Pacific oceans as well as within 200 nautical miles of the coast. It did not identify these users in the WRC-07 proceeding, however, "because they did not appear in its licensing database," it said.

"Apparently, fishing vessels have operated radio buoys in US waters under the belief that a ship station license issued under Part 80 of the Commission's rules permits operation of the buoys," the FCC *Order* continued. The FCC said a Part 80 license applies only to stations in the maritime services and does not authorize operation of radio stations requiring a Part 90 license, "such as the radio buoys at issue here."

The FCC said its action regarding 1900-2000 kHz supports increased use of 160 meters as reported by commenters in the proceeding and provides "spectrum support" for Amateur Radio emergency communication. The FCC said its action also offers the Amateur Service "the long-term security that primary status entails."

In removing the primary RLS allocation, the FCC added a new footnote to the US *Table of Allocations* that provides for radio buoy operations in the 1900-2000 kHz segment on a primary basis in Region 2 (the Americas) and on a secondary basis in Region 3, which limits operations to the open sea.

"The Commission nevertheless recognized the public benefit associated with the use of radio buoys by the US commercial fishing fleet," the FCC continued. It adopted a waiver of the Part 80 and Part 90 rules to authorize offshore radio buoy use by commercial fishing vessels, concluding that the granting the waiver was in the public interest. "Use of these radio buoys allows such commercial fishing vessels to locate their fishing lines and nets more quickly, which saves them fuel and time and reduces the likelihood that fishing lines and nets will be lost," the FCC said.

The FCC said that since the buoys "appear to use low power and narrow bandwidths," they should have "minimal impact" on Amateur Radio users of the 1900-2000 kHz segment.

The FCC also concluded that it is in the public interest to establish a secondary Amateur Radio allocation at 135.7-137.8 kHz — 2200 meters, although the new band is not yet authorized for amateur use. "In accordance with the WRC-07 *Final Acts*, the Commission also restricted use of this secondary Amateur Service allocation to amateur stations transmitting a maximum equivalent isotropically radiated power (EIRP) of 1 W." The Commission is **inviting comments** until August 31 on how it should structure operational rules for that allocation as well as for a proposed 472-479 kHz allocation, 630 meters.

SHORTS

CONDITIONS FOR THE ARRL VHF CONTEST WERE DISAPPOINTING – Band conditions for Indiana, especially for 6 meters, were dissappointing but other areas of the US did better. We seemed to be in a hole with signals going over us. This contest usually has some of the best 6 meter opening of the year. The following weekend, conditions were great for the SMIRK contest, with 6 meters open to all the 48 states, Mexico, and the Caribbean. Canary Islands was also in the mix. – K9RU

EO-80 (QB50P2) FM TRANSPONDER TESTING IS SUCCESSFUL – AMSAT-Francophone has reported successful testing of the FM transponder on EO-80 (QB50p2). Two 2U CubeSats, QB50p1 and QB50p2, launched in June of 2014 into a polar orbit at an altitude of approximately 420 miles. QB50p2 is equipped with a secondary FM transponder payload developed by AMSAT-F.

On June 16, the primary ground control station in the Netherlands activated the

transponder on QB50p2 for one orbit. AMSAT-F reports that CW telemetry was received at the École Polytechnique near Paris, and the FM transponder, with an output of 1.5 W, was activated, with strong signals heard on Earth.

Although the transponder was turned off at the end of that single orbit, it is anticipated that it will be activated permanently within a few weeks, possibly at the 500 mW or 1 W level.

EO-80 frequencies: 145.880 MHz, 1200 bps BPSK or CW telemetry; FM transponder, 435.080 MHz (210.7 Hz tone) uplink; 145.840 MHz downlink (also 9600 bps FSK data).

QB50p1 (EO-79), also known as FUNcube-3, is equipped with a linear transponder for SSB and CW. Initial testing was successfully completed in April, and its transponder should also be enabled full-time in a few weeks. -- *AMSAT News Service*

US NAVAL ACADEMY CUBESATS GET OSCAR NUMBERS – AMSAT has announced that two US Naval Academy-sponsored CubeSats have been assigned OSCAR numbers. BRICsat now will be known as NO-83, and PSAT has been designated as NO-84. OSCAR Number Administrator Bill Tynan, W3XO, made the assignments in response to a request from Bob Bruninga, WB4APR, at the Naval Academy.

The two satellites were among several that were launched on May 20 from Cape Canaveral.

PSAT (NO-84) is a student satellite project, named in honor of USNA alumnus Bradford Parkinson of GPS fame. Its payloads include an APRS transponder for relaying remote telemetry, sensor, and user data from remote users and Amateur Radio environmental experiments or other data sources back to Amateur Radio experimenters via a global network of Internet-linked ground stations.

PSAT's digipeating capabilities are essentially the same as PCSat (NO-44) and the Amateur Radio packet system on the International Space Station. PSAT is on 145.825 MHz (1200 baud APRS), and BRICsat is on 437.975 (1200/9600 baud AX.25).

BRICsat-P (NO-83) -- the Ballistic Reinforced Communication Satellite -- is a low-cost 1.5 U CubeSat built in the US Naval Academy Satellite Lab in collaboration with George Washington University. It was designed to demonstrate on-orbit operation of a micro-cathode arc thruster (µCAT) electric propulsion system and carries an Amateur communication payload.

PSAT and BRICsat also carry 300 mW Brno University PSK31 transponders -- 28.120 MHz up/435.350 MHz (FM) down. The PSK31 transponder, PSAT's primary mission, permits dozens of simultaneous users to operate full duplex and maintain a continuous group dialogue throughout a pass. --*ARRL Letter*

KEYSIGHT TECHNOLOGIES DONATES SPECTRUM ANALYSIS SOFTWARE TO ARRL LAB – Keysight Technologies (formerly Agilent) has donated software that will augment the feature set of the ARRL Laboratory's MXA-9020A spectrum analyzer. The donation includes *89600 VSA* vector signal analysis software. According to ARRL Lab Senior Test Engineer Bob Allison, WB1GCM, *89600 VSA* gives the MXA-9020A the ability to measure the parameters of digital signals. Keysight also contributed its *BenchVue* software, which can control the instrument and capture data and images without requiring programming.

"With the help of Keysight and ARRL Laboratory technical advisors, the ARRL Laboratory will be able to develop test methods to better quantify the performance of digital Amateur Radio transceivers," Allison said.

Under the direction of Keysight Vice President Bob Witte, K0NR, application engineers Ken Voelker, K0KV, and Tom Holmes, N8ZM, delivered the *89600 VSA* software to ARRL Laboratory Manager, Ed Hare, W1RFI, and Allison at the close of the 2015 Dayton Hamvention®. The donated software includes provisions to assess additional modes of operation, including the ability to analyze I/Q signals and to measure noise figure, pulse signals, and phase noise.

"The Lab is grateful to Keysight for this significant donation, which provides us with previously unavailable capabilities to analyze the characteristics of digital signals, said Hare. --ARRL Letter

***THE ARRL EXTRA CLASS LICENSE MANUAL* NOW AVAILABLE ON KINDLE –** The ARRL has just released a digital edition of *The ARRL Extra Class License Manual* in Kindle format, in addition to the print manual. The Kindle edition from Amazon completes the suite of ARRL license manuals available in e-book format.

The ARRL also offers Kindle editions of The ARRL Ham Radio License Manual, The ARRL General Class License Manual and its question-and-answer study guides, ARRL's Tech Q&A, ARRL's General Q&A, and ARRL's Extra Q&A.

The ARRL Extra Class License Manual is also available in softcover (ARRL Item No 5170, retail $29.95) from the ARRL Store or from your ARRL Publication Dealer, or call 860-594-0355 (toll free in the US, 888-277-5289) to order.

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