



Legacy Amateur Radio Club

RCA AMATEUR RADIO CLUB

INDIANAPOLIS, INDIANA



AFFILIATED CLUB

MARCH, 2016

MONTHLY NEWSLETTER

THE NEXT MEETING OF THE RCA AMATEUR RADIO CLUB WILL BE
TUESDAY, MARCH 8th, 6:30 PM AT [G.T. SOUTH'S](#),
5711 E. 71st STREET, INDIANAPOLIS, IN

RCA ARC NEWS

SUMMARY OF THE FEBRUARY MEETING – Status of the repeater: Working properly. Very few digital QSOs taking place. Two new voice IDs were added to call attention to the fact that the Yaesu Fusion digital modes are active. The 6m beacon is partially installed and needs to be finished, hopefully in warmer weather. Jim, K9RU, reported the 147.21 repeater is temporarily at K9LZJ's remote station in Greenfield. Reminders: The Brownsburg Hamfest, VE testing on Saturday, and the IRC meeting Friday evening. A discussion on the possibilities of linking C4FM repeaters was discussed. Conclusion, we don't know enough about it. Tales of operating during the January VHF contest followed.

NEXT TEST AMATEUR RADIO LICENSE TEST SESSION

Time: Saturday, March 12th. Exams start at noon. Walk in allowed.
Location: Salvation Army EDS Training Facility
4020 Georgetown Rd
Indianapolis IN 46254-2407
Contact: Rhonda Curtis, Phone: (317) 363-7457 e-mail: ws9h@arrl.net

INDY MINI-MARATHON, MAY 7 - AMATEUR RADIO VOLUNTEERS – It is not too early to start thinking about volunteering to help out with the amateur radio communications for the Mini-Marathon. This is a lot of fun and there are the 500 Festival "perks", such as the free t-shirt, volunteer day passes at the IMS track, etc.

For more information contact:

Michael R. Palmer, N9FEB, N9FEB@comcast.net
(317) 849-3602 home, (317) 753-8691 cell, www.IndyHams.org

HAMFESTS, OPERATING EVENTS, VOLUNTEER OPPORTUNITIES

Mar 5-6 ARRL DX – SSB Contest <http://www.arrl.org/arrl-dx>
Mar 12 Terre Haute Hamfest <http://www.w9uuu.org>
Mar 26 33rd Annual Columbus Hamfest <http://www.carcnet.net>
Apr 16 North Central Indiana Hamfest <http://nci-hamfest.net>
May 20-22 Dayton Hamvention <http://hamvention.org>
July 8-9 Indianapolis Hamfest <http://www.indyhamfest.com>

Opportunities for public service: <http://indyhams.org/events>

FCC INVITES COMMENTS ON ARRL PETITION THAT SEEKS 80/75 METER ADJUSTMENTS

The FCC has put the ARRL's January *Petition for Rule Making* ([RM 11759](#)) on public notice and invited interested parties to comment on what the League has called "minimal but necessary changes" to 80 and 75 meters. The ARRL petitioned the FCC to fix a "shortfall in available RTTY/data spectrum" that the Commission created when it reapportioned 80 and 75 meters 10 years ago. The League's petition asked the FCC to shift the boundary between the 80 meter RTTY/data subband and the 75 meter phone/image subband from 3600 kHz to 3650 kHz. The proposed change received strong support from ARRL members, and the ARRL Board of Directors adopted it as policy at its July 2015 meeting. At that time the Board also agreed to seek RTTY and data privileges for Novice and Technician licensees within their current 15 meter CW subband, and to do the same on 80 meters, depending on the outcome of the 80/75 meter subband revision.

The petition asks the FCC to make the following changes to the Part 97 Amateur Radio Service rules, with respect to 80/75 meters:

Modify the RTTY/data subband, so that it extends from 3500 kHz to 3650 kHz.

Modify the phone/image subband, so that it extends from 3650 kHz to 4000 kHz.

Make 3600-3650 kHz available for General and Advanced Class licensees, as was the case prior to 2006.

Make 3600-3650 kHz available to Novice and Technician licensees for telegraphy -- consistent with existing rules permitting Novices and Technicians to operate CW in the 80, 40, and 15 meter General and Advanced RTTY/data subbands.

Modify the rules governing automatically controlled digital stations (ACDS), to shift the ACDS segment from 3585-3600 kHz to 3600-3615 kHz, consistent with the IARU Region 1 and 2 band plans.

According to the ARRL, the FCC *Report and Order* in Docket 04-140 released in 2006 departed substantially and without justification from the rules proposed in the FCC's so-called "Omnibus" *Notice of Proposed Rule Making (NPRM)*, with respect to 75 and 80 meters. Among other actions, the resulting changes expanded voice privileges on additional frequencies in various bands, including 75 meters. The FCC shifted the phone/image subband from 3750-4000 kHz to 3600-4000 kHz, trimming the 80 meter RTTY/data subband from 3500-3750 kHz to 3500-3600 kHz and substantially changing "the entire dynamic of this band," the League said.

Although the Omnibus *R&O* had indicated that incumbent licensees would not lose any operating privileges, some clearly did, the ARRL has pointed out. The most substantial adverse effect of the "unexpected and vast expansion" of the 75 meter phone/image subband, the League said, was the elimination of access to 3620-3635 kHz by ACDS. Read [more](#). --ARRL Letter

FCC SEEKS COMMENTS ON PETITION TO GRANT LIFETIME AMATEUR RADIO LICENSES

The FCC is seeking comments on a *Petition for Rule Making* ([RM 11760](#)) that asks the FCC to grant lifetime Amateur Radio licenses. Mark F. Krotz, N7MK, of Mesa, Arizona, filed his request with the FCC last November. He wants the FCC to revise § 97.25 of its rules to indicate that Amateur Radio licenses are granted for the holder's lifetime, instead of for the current 10-year term. Krotz noted that the General Radiotelephone Operator License (GROL) already is issued on a lifetime basis, and he maintained that not having to renew licenses would lighten the FCC's workload.

"It would be mutually beneficial for the FCC and Amateur Radio operators to update Part 97 to grant operator licenses for lifetime," Krotz said in his filing. "The FCC would benefit by reducing

administrative costs."

In 2014, the FCC granted lifetime credit for examination elements 3 and 4, but applicants seeking relicensing under that provision still must pass examination element 2.

Individuals may [submit](#) comments via the FCC's Electronic Comment Filing System (ECFS).
--ARRL Letter

NATIONAL PARKS ON THE AIR UPDATE

Since the creation of the Manhattan Project National Historic Site by the National Park Service (NPS) in mid-November 2015, activating one of the three sites comprising this unit has been impossible, in large part because gaining access to active Department of Energy sites is exceptionally difficult. The only site of the three with any hope of regular public access is Oak Ridge, Tennessee. On February 24, NPOTA administrators decided that any location within the boundaries of the Oak Ridge Reservation, as outlined on the [NPS Manhattan Project](#) website, will count for NPOTA credit. Activators must be sure not to transmit from private property without prior approval.

There are 35 activations on the NPOTA Activations Calendar between February 25 and March 2, including Petroglyph National Monument in New Mexico, and Moore's Creek National Battlefield in North Carolina -- as part of the 240th anniversary celebration of the Battle of Moore's Creek Bridge during the Revolutionary War.

[Details](#) about these and other upcoming activations can be found on the NPOTA Activations calendar.

Keep up with the latest NPOTA news on [Facebook](#). Follow NPOTA on [Twitter](#) ([@ARRL_NPOTA](#)).
--ARRL Letter

AMSAT SEEKS VOLUNTEERS TO SUPPORT PHASE 4 "FIVE AND DIME" GROUND TERMINAL EFFORT

Established less than 1 year ago, AMSAT's all-volunteer [Phase 4 Ground Terminal](#) team has made significant strides in developing an ensemble of solutions to support the so-called "Five and Dime" (5 GHz and 10 GHz) strategy AMSAT has embraced for microwave satellite projects. Prompting the effort is the planned launch of a geosynchronous military satellite in the 2018 time frame, which could play host to an Amateur Radio payload operating on the two microwave bands. The overarching project, which also includes a complementary Phase 4 Space team, is exploring new territory and innovative solutions, and it's seeking [volunteers](#) from among the technically savvy within the Amateur Radio community.

"We're going to make it as awesome as possible," Ground Station team lead Michelle Thompson, W5NYV, told ARRL. The project not only would support the Phase 4B geosynchronous launch, but provide solutions for the Phase 3E high-Earth orbit satellite, and receiver support for AMSAT's entry into the NASA Cube Quest Challenge, which would go to the moon.

Thompson said the compelling technical reason for using 5 GHz and 10 GHz is the ability to use high-bandwidth modes on those bands. In addition, "the 5 and 10 GHz bands are popular elsewhere, and other projects are embracing this band complement," she noted. Another advantage would be to raise Amateur Radio's profile on the two bands and perhaps "shake things up" there for terrestrial use. "The 5 and 10 GHz bands are a compromise that's working really, really well," Thompson said.

The US Air Force will control the geosynchronous satellite. Virginia Tech, Millennium Space Systems ([MSS](#)), FEMA, various clubs, as well as AMSAT and ARRL are partners in, or are supporting, the project. A formal memorandum of understanding is pending.

Cognitive Radios

"We're currently exploring the Amateur Radio implementation of a very advanced and exciting

open standard called **DVB-S2X** for the downlink," Thompson explained, noting it offers a variety of modulation and coding. Earth stations will use their individual radios, transmitting a digital signal -- probably something called Offset QPSK (O-PSK) -- directly to the satellite, with each getting its own channel in a frequency division, multiple access (FDMA) scheme.

"This is an elegant way to design an efficient and advanced communication system and allows technical volunteers to experiment with the basics of cognitive radio -- radio that can sense the environment and adapt to take full advantage of the capabilities the hardware offers," she said.

Groundsats and a "Big Honking SDR"

Phase 4 radios will be designed to work not just with the impending geosynchronous satellite but through terrestrial microwave "Groundsats," which, Thompson said, "are essentially satellite simulators that let you test and use the radio terrestrially." Phase 4 radio designs also could be configured to use modulation schemes that are better able to deal with terrestrial multipath.

Amateur Radio Access Points (ARAPs) -- essentially signal aggregators -- would allow legacy radios, FM handheld transceivers, or emergency traffic providers to use the satellite from any point where an ARAP can be deployed, packaging the input for uplink to the satellite. Hams within ARAP range would be able to use the Five and Dime terrestrial network just as if they were operating through a satellite.

"The Groundsat, which is doing the same job as the satellite payload, has a big honking SDR on it," Thompson said. Groundsat equipment has arrived and is in use in San Diego, North Texas, and at Virginia Tech, and Groundsat development is under way at those sites. A fourth site would be at Morgan State University in Maryland.

Doing It on the Cheap

The name "Five and Dime" also reflects the project's economics. AMSAT Board Member and Virginia Tech Research Professor Bob McGwier, N4HY, recently explained on the AMSAT-BB that the Ground Team's work is "an effort to design an inexpensive ground terminal for amateurs that would cost tens of thousands of dollars commercially, for as much under \$1000 as we can get it."

[If you're interested in DVB-S2, GNU Radio, HackRF, etc., you'll find this stuff interesting!]

To **volunteer** for the Phase 4 Ground Team, provide your contact information on AMSAT's Engineering Team [contact form](#). Weekly "Phase4" engineering updates are available via YouTube, <https://www.youtube.com/watch?v=ZaimBccaaGo> and [FaceBook](#). Additional [development documentation](#) is posted on GitHub. Read [more](#). --ARRL Letter

SATELLITE DXCC NEARLY 20 YEARS IN THE MAKING

It took nearly 20 years, but [AMSAT](#) Vice President of Operations Drew Glasbrenner, KO4MA, finally qualified for Satellite DXCC. Glasbrenner submitted the requisite number of QSLs for checking at the Orlando [HamCation](#) February 12-14, and ARRL Media and Public Relations Manager Sean Kutzko, KX9X, verified KO4MA's achievement.

"It's been a long process getting to satellite DXCC," said Glasbrenner, who got into satellite operating around 1993, and was only on RS-12 (Mode K) for a long time. "This was the Russian satellite payload that used 15 meters up, and 10 meters down."

Glasbrenner's activity stagnated for a long time during and after his college years, but in 1999 he got involved in working the LEO satellites, such as UO-14, AO-27, FO-20, FO-29, and AO-10 "when it was still semi-usable," he added.

"When AO-40 was launched into a high-Earth orbit, I dove into Mode U/S with gusto," Glasbrenner recounted. During the 3 years that AO-40 was active, he spent many late nights and early mornings looking for the next new one. "Eventually I was using a 3-foot solid dish with preamp and downconverter for the Mode S downlink, and this is when some of my most exciting contacts came."

Highlights included working VU2MKP at a few degrees of elevation to the east, right after the

satellite came up, and working KH2GR in the other direction.

When AO-40 went silent, Glasbrenner said he was about a dozen short of DXCC, and he realized that he'd have to be proactive to finish up with just LEO satellites. Many of his new ones came from operators who went the extra mile to operate from places like the Caribbean and Greenland.

Glasbrenner said the absence of operational HEO satellites "makes satellite DXCC nearly impossible for newer operators."

Bernhard Dobler, DJ5MN, has been at the top of the DXCC Satellite standings since 2000, and has 274 entities confirmed. Read [more](#). --ARRL Letter

US AMATEUR RADIO NUMBERS CONTINUES TO SOAR

Amateur Radio is alive and well! Growth in the US continued in 2015, with a record 735,405 licensees in the FCC's Universal Licensing System (ULS) database by the end of the year. That's up 9130 over December 2014, a 1.2 percent rise, continuing a steady increase in the Amateur Radio population in every year since 2007. In 2014, the Amateur Radio ranks grew by a net 8149 licensees. The figures, compiled by Joe Speroni, AH0A, on his FCC Amateur Radio Statistics web pages, exclude expired licenses that are within the 2-year grace period, and club station licenses. Compared with the same month 10 years ago, the Amateur Radio population in the US has expanded by 72,805 licensees — or nearly 11 percent.

As expected, the biggest growth by license class was in Technician licensees, which rose by 6570 in 2015. General ranks increased by 3079, and Amateur Extra numbers went up by 3496. The 2015 overall numbers faltered a little in April before rebounding in July. The introduction of a new General class question pool on July 1 appeared to have only a slight effect on month-to-month numbers in that license class. ARRL VEC Manager Maria Somma, AB1FM, said 2015 was another banner year for ARRL VEC-sponsored test sessions.

"For the second year in a row, we have conducted more than 7000 Amateur Radio exam sessions in a year, an important milestone for the ARRL VEC," she said. "A total of 7358 ARRL-sponsored exam sessions were administered in 2015, compared to 7216 in 2014. The number of exam applicants was down slightly in 2015, compared to the previous year, and the number of examination elements administered also dipped slightly, she noted.

"Since 2014 was a record-setting year, the numbers of 2015 examinees didn't drop so much as return to more typical levels," she explained.

Somma pointed out that the ARRL-VEC also processed and filed nearly 10,100 license renewals and address changes for members in 2015. This is a free service to ARRL members.

Technician licensees still comprise a little less than one-half of the US Amateur Radio population. As of December 31, some 47,850 Advanced and 10,800 Novice licensees remained in the FCC database. The FCC no longer issues Advanced and Novice licenses, and their numbers continue to decline.

Once again, California far and away was home to the largest number of licensees among the 50 states, with 103,938 at the end of 2015, up from 102,735 at the end of 2014. North Dakota remained the state with the fewest number of Amateur Radio licensees, with 1510, up very slightly over the previous 12 months. Club station licenses in the US number 11,599, according to Speroni's web pages. — Thanks to Joe Speroni, AH0A; FCC ULS licensing statistics

TECHNICAL

ARTICLE PROFILES FIRST AFRICAN-AMERICAN RADIO AMATEUR, RUFUS TURNER, W3LF — The computer hardware/software/do-it-yourself blog *Hackaday* has [profiled](#) Rufus Turner, W3LF (ex-K6AI) -- believed to be the first African-American radio amateur and one of the more fascinating personalities in US history. Born on December 25, 1907, in Houston, Texas, Turner "became fascinated by crystal diodes and published his first article about radio when he was 17,"

according to *Hackaday*. He went on to build what *Hackaday* described as "then the world's smallest radio set" in 1925, while still a teenager.

In the day when radio amateurs still were allowed to broadcast, W3LF became the first radio station licensed to an African-American. He broadcast with a 15 W in Washington, DC, and operated another radio station for his church.

Working with Sylvania in the 1940s, Turner helped to develop the 1N34A germanium diode. And in 1949, he wrote "Build a Transistor" for Hugo Gernsback's *Radio-Electronics* magazine ([May 1949 issue](#), p 38) -- at a time when transistors (aka "crystal triodes") not only were cutting edge but not commercially available. His meticulously described project involved the sacrifice of two 1N34A diodes.

In January 1950, his article, "A Crystal Receiver with Transistor Amplifier" appeared in *Radio and Television News*, along with plans for a three-transistor radio. This was in the days before such things had begun to appear on the market.

While he had attended Armstrong Tech in Washington, DC, and he became a licensed professional engineer, he veered into the non-technical sphere of academe later in his life, earning bachelor's and master's degrees in English, and in 1960 -- at age 52 -- becoming an English professor. Read [more](#). -- *Thanks to Hackaday, Southgate Amateur Radio News, Radio-Electronics*

Editor's note: Pretty amazing (maybe it helps if you're old!). This guy describes how to make a transistor out of two 1N34 diodes. He must have had infinite patience! I think I still have the first 1N34 I bought. Take a look at the articles and ads in the May 1949 issue of *Radio-Electronics*. <http://www.americanradiohistory.com/Archive-Radio-Craft/1940s/Radio-Craft-RE-1949-May.pdf>

--AF9A

SHORTS

"Ham Radio Now" Hosting 2015 ARRL/TAPR Digital Communications Conference Video Presentations: Full-length video of all major presentations at the 2015 ARRL/TAPR Digital Communications Conference (DCC) is now online, courtesy of "[Ham Radio Now](#)." This includes the 16 individual talks on subjects ranging from making a *WSPR* transmitter from a Raspberry Pi to advances in HF receiver testing to building your own networked satellite ground station. Each talk runs about 45 minutes. The DCC Sunday "Deep Dive" -- 4 hours on a single topic --covered 3D modeling for Amateur Radio. Saturday night banquet speaker ARRL Contributing Editor Ward Silver, N0AX, posed the question: "Ham Radio... Now What?" DCC videos are grouped in a YouTube [Playlist](#).

New Amateur Extra Question Pool Puts Greater Emphasis on Digital, SDRs, Propagation: The new Amateur Extra class license examination question pool, effective from July 1, 2016, through June 30, 2020, now is available at the National Conference of Volunteer Coordinators ([NCVEC](#)) website. The latest revision contains a few minor corrections that had been released in a February 5 errata of the initial January 8 release. NCVEC Question Pool Committee Chair Rol Anders, K3RA, said the new pool represents a fairly significant change relative to the current question pool, which expires on June 30.

"The primary change is modernization of the pool to place more emphasis on digital communications, digital test equipment, software defined radios, and propagation/space weather," he said. "Also, a number of other topics were added, including questions on some additional antenna types commonly used by radio amateurs." Anders said that room to cover the new topics was made in the question pool by dropping some questions that had been in the expiring pool. Read [more](#).

"Ham TV" System Used for First Time During ARISS Contact with UK School: The "[Ham TV](#)" digital Amateur Radio television system onboard the International Space Station was used for the first time ever this month for an Amateur Radio on the International Space Station ([ARISS](#)) school contact. UK and ESA Astronaut Tim Peake, KG5BVI, inaugurated the system as he spoke

on February 11 with students at a school in Rickmansworth, England. The DATV system in the *Columbus* module of the ISS allowed students at Royal Masonic School, home of GB1RSM, to see as well as listen, as Peake, operating as GB1SS, answered their questions about life in space. The one-way DATV downlink took place near 2.4 GHz, while the two-way FM audio component was maintained on 2 meters. The IK1SLD ground station received the Ham TV signal.

"It was a historic event!" enthused past ARISS-EU Chair Gaston Bertels, ON4WF, who helped shepherd the DATV system into existence after it was first proposed more than 15 years ago.

As students at the all-girls school looked on, Peake's image appeared on a large viewing screen before a fully packed auditorium. Peake's [Principia Mission](#) has been aimed at engaging students on Earth in science, technology, engineering, and mathematics (STEM) subjects. Read [more](#).
--ARRL Letter

IEEE Microwave Theory and Techniques Society Honors Ulrich Rohde, N1UL: Ulrich Rohde, N1UL, has been honored with the 2016 Microwave Application Award by the [IEEE](#) Microwave Theory and Techniques Society. He was credited with "Significant contributions to the development of low-noise oscillators." The Microwave Application Award recognizes an individual, or a team, for an outstanding application of microwave theory and techniques that have been put into practice within the past decade.

Rohde will receive the award at the annual IEEE MTT-S International Microwave Symposium Awards banquet this May in San Francisco.

In 2015 Rohde was named by the IEEE to receive the prestigious [I. I. Rabi Award](#), recognizing outstanding contributions related to the fields of atomic and molecular frequency standards, and time transfer and dissemination. Rohde is the author of some 200 scientific papers and books, and has written articles for *QST* and *QEX*.

VHF Groups Join Forces to Sponsor "Super Conference" The Southeastern VHF Society ([SVHFS](#)), North East Weak Signal Group ([NEWS](#)), and Mount Airy VHF Radio Club ([Pack Rats](#)) are cosponsoring a [VHF Super Conference](#), hosted by the Grid Pirates Contest Group (K8GP) and Directive Systems and Engineering. The conference will take place April 15-17 in Sterling, Virginia.

Early [registration](#) discounts are available. Conference *Proceedings* in printed and digital form will be available after the event. Sign up when registering. All registrations include lunch and all-day beverages.

The event will feature an array of forums and workshops, a test lab, and a conference banquet. A microwave loop Yagi workshop will be offered during the weekend at an additional fee. The workshop will explain how loop Yagis work, how to adjust them, and how to build one. Free shuttle service will be available to the [Udvar-Hazy Air & Space Museum](#).

A second call for papers and presentations for the VHF Super Conference has been issued. The conference sponsors are seeking presentations or papers dealing with all aspects of VHF, UHF, microwave, and higher. Topics may include operating, contesting, homebrewing, software, EME, surplus, antennas, test equipment, amplifiers, and SDR. Photos are encouraged.

Steve Kostro, N2CEI, and Paul Wade, W1GHZ, are coordinating *Proceedings*. Direct [submissions and questions](#) to them via e-mail. --ARRL

The N3FJP logging program is growing an API (Application Programming Interface)! Starting in February 2016, functionality that will enable other programs to "talk" to the N3FJP logging program will start to be incorporated in the software. [Initial functionality](#) includes the ability to get/set text entry fields, get/set the frequency, band, mode, log a contact, check for dupes, and more. See the [N3FJP website](#) for more information.

This year's Armed Forces Day Crossband Communication Test on Saturday, May 14, will include a significant new wrinkle: Select military stations will be using 60 meter interoperability channels to communicate *directly* with Amateur Radio stations on the band. Back this year, select military stations will use crossband Automatic Link Establishment (2G ALE) communication as well as MIL-STD Serial PSK to send the Secretary of Defense Armed Forces Day message. Armed Forces Day 2016 is Saturday, May 21, but the radio event is held earlier to avoid conflicting with Dayton [Hamvention](#), May 20-22.

The annual Armed Forces Day Communication Test is an opportunity to exercise two-way communication capability between Amateur Radio and military stations using a variety of modes, including SSB and CW as well as digital modes. The annual event gives participants — including shortwave listeners (SWLs) — an opportunity to demonstrate their technical skills, and to receive recognition from the appropriate military radio station.

QSL cards will be provided to all stations that make contact with the military stations. The Army, Air Force, Navy, Marine Corps, and Coast Guard cosponsor the joint military/Amateur Radio, with military stations transmitting on military frequencies and listening on Amateur Radio bands.

Amateur Radio stations and Short Wave Listeners interested in trying the MIL-STD Serial PSK mode can [download](#) the software program, *MS-DMT*.

Full details about this year's Armed Forces Day radio activities — including stations, frequencies, times, and modes of operation — will be [posted](#) by April 12 as well as on the US Army MARS [Facebook page](#).

The Radio Club of Argentina ([RCA](#)) and [AMSAT-LU](#) have announced the first satellite contact between Argentinean Antarctica and mainland Argentina on February 28 via SO-50. The RCA's website [reports](#) the historic contact was arranged by the Radio Club of Argentina and AMSAT-LU.

Marcelo Duca, LU1AET, and Federico Mainz, LU5UFM, had studied the passes of various amateur satellites over Argentina. Duca was at Carlini Antarctic Base, May 25 Island, South Shetland, in Argentinean Antarctica, while Mainz was in Miramar, in Buenos Aires Province on the mainland — a distance of nearly 2700 kilometers.

"At the appointed hour, Marcelo (with Carlos, LU1BCE, at his side) made the first call from Carlini Base via SO-50. He got an immediate reply from Federico in Miramar. They exchanged signal reports and talked for more than 2 minutes," The RCA website recounts. Duca was running 15 W, while Mainz was running just 4 W using a hand-held transceiver.

NASA has made [a time-lapse movie of 1 year's observations from its Solar Dynamics Observatory](#). Flares, ejections, its all here; each frame represents 2 hours in the life of the sun. If you have the capability to display it, you can also [download a 4K version](#) (3840 x 2160 at 29.97 frames per second). (Dennis, N6KI)

David, WA1OUI, sends a link to a [video detailing the human implications of living in the National Radio Quiet Zone](#). "It's about the thousands of square miles around the National Radio Telescope in West Virginia [Including parts of Virginia and Maryland -- *Ed.*] that must be radio emission free, and what that does to the inhabitants: no cell, microwave, Wi-Fi, ham radio or anything!"

THANKS FOR READING!

THE RCA ARC MONTHLY NEWSLETTER IS COMPILED AND EDITED BY JIM RINEHART, AND JIM KEETH. ALL MATERIAL CONTAINED HEREIN IS OBTAINED FROM THE SOURCES CREDITED AND EDITED FOR THIS NEWSLETTER. EMAIL TO <mailto:WebMaster@w9rca.org>. Check our web site at <http://www.w9rca.org/>