



RCA Amateur Radio Club

Indianapolis, IN

ARRL Affiliated Club

www.w9rca.org



MARCH 2023

MONTHLY NEWSLETTER

THE NEXT MEETING OF THE RCA AMATEUR RADIO CLUB WILL BE TUESDAY, MARCH 14th, 6:30 PM AT NORTH SIDE EVENTS, FORMERLY THE KNIGHTS OF COLUMBUS, 2100 EAST 71st, INDIANAPOLIS, IN

RCA ARC NEWS

FEBRUARY MEETING SUMMARY – The meeting was on Valentines day and the events center had a big crowd with all the tables reserved. They had missed our meeting on their schedule but were still able to accommodate us. We spent some time before the meeting discussing FT8 operation. Working DX using the Fox and Hound mode and the DXpeditions that were on. Treasurer, Gregg K0GAH, reported we still had funds to sustain the club for several years. AF9A reported there is an issue with the W9RCA repeater CTCSS tone encoder being intermittent. It has been a problem in the past but John, KF9UH has been able to temporarily correct it by reseating circuit cards and connectors in the repeater. We will coordinate a time with John to meet at the repeater and check out the problem. We voted to pay the repeater council dues and K9RU will find out the amount. Brian Smith, W9IND is going to have a ZOOM Field Day and we will find out details for the FD operation this year. Our club will be responsible for manning and setting up the 6 meter station.

AMATEUR RADIO LICENSE TEST SESSION

Date: Saturday, March 11, 2023
Time: Starting at Noon **by appointment only.**
Location: Salvation Army EDS Training Facility, 4020 Georgetown Rd
Indianapolis, IN 46254-2407
Contact: Jim Rinehart Ph:(317) 721-1458
Email: k9ru@arrl.net
Required: FCC FRN and a completed NCVEC 605 license application form.

Laurel VEC test sessions: <https://www.laurelvec.com/?pg=exams>
Online amateur radio license tests sessions:
ARRL online test sessions: <http://www.arrl.org/findonlineexam>
Additional online examination dates and teams : <https://hamstudy.org/sessions>

NEW TO HAM RADIO? NEED A VHF / UHF ANTENNA? Bud, W9GOV, has an almost new Comet GP-3 antenna he would like to give to a new ham who may need a little help getting on VHF/UHF. The antenna is 5 ft 3 in tall and will fit in most attics. Bud wants to help someone like so many hams who have helped him over the years. Email Bud at: budw9gov@gmail.com

HAMFESTS, OPERATING EVENTS, VOLUNTEER OPPORTUNITIES

Salvation Army Open Net, Thursday, 7PM, W9RCA repeater, 146.88 MHz, tone 88.5 HZ

- March 11 Wabash Valley ARA Hamfest, Clay County 4H Fairgrounds, Brazil IN, <http://w9uuu.org/>, Public Contact: Chuck Procarione W9COD, Phone: 812-239-8061, Email: hamfest@w9uuu.org
- March 25-26 CQ World Wide WPX Contest <https://www.cqwpix.com/>
- April 1 Columbus Hamfest, Columbus North High School Cafeteria, Columbus, IN, Public Contact: Mike Idlewine WE9MI, Phone: 812-521-6206, Email: idlewine@comcast.net

WA7BNM expanded contest calendar, <https://www.contestcalendar.com/contestcal.htm>

HAM RADIO OPERATORS NEEDED FOR THE 2023 500 FESTIVAL ONEAMERICA MINI MARATHON, MAY 6TH. – The 500 Festival OneAmerica Mini Marathon is one of America's Most Iconic Half Marathons, running through the heart of downtown Indy with a lap around the Indianapolis Motor Speedway.

Again this year amateur radio operators will work with the Mini Marathon as spotters at different locations around the course.

You will need a 2M or 440 MHz ht and be at your assigned location by 6:30 AM and you should be finished by noon.

The few years off during the COVID-19 pandemic has significantly impacted the pool of amateur radio volunteers. We are currently 16 volunteers short of minimum staffing to support this event. Minimum staffing means 1 operator per position. Ideally it would to have 2 volunteers at each location.

Volunteers need to complete the form: <https://forms.office.com/r/jM35QxzfzD>

For more information contact: Brent Walls, N9BA: bwalls@arri.net I will have event specific event information by mid March. Edited K9RU .

INDIANAPOLIS TO GET A 35,000 SQUARE FEET MICRO CENTER CONSUMER ELECTRONIC STORE – Indianapolis consumer electronic customers will no longer have to make the trek to Chicago or Cincinnati. Micro Center is opening its latest 35,000 sq. ft retail location in Castleton at 5702 E. 86th Street, which is near the intersection of 86th and Allisonville Road. The site is in the Castle Glen Shopping Center and at the location of a now closed Gander Mountain store.

This will be the first and only location of the retailer in Indiana. “We are incredibly excited to bring Micro Center’s likely one and only location to Indianapolis,” said Keith W. Stark, the CEO of ConsortiumRE, the real estate company working with Micro Center.

The company cited Castleton’s status as a super regional trade area, with more than 100 million visitors per year. It also is home to the largest retail concentration in the state, according to the press release.

According to a press release, “Micro Center is among the nation’s leading information technology, communications, and electronic device suppliers, twenty-five large stores in major markets nationwide. Founded in 1979 in Columbus, Ohio, Micro Center has grown steadily and profitably. Our stores are designed to supply the needs of a wide variety of consumers – from small businesses to local schools – with well-trained associates who offer information technology solutions.”

Micro Center specializes in a wide variety of consumer electronics and computers. Known for

“build your own PC” supplies, 3D printers, and major retailer products such as Apple and Samsung.

An opening date is anticipated around back to school time in late July/early August 2023. Micro Center posted a job listing for a general manager position [on its website](#). INDIANAPOLIS (WISH)

VOLUNTEERS NEEDED FOR THE 30TH ANNUAL OWEN-PUTNAM STATE FOREST (OPSF) 50-MILE, 50-KILOMETER, AND 14-MILE TRAIL FOOT RACE. – The OPSF50|50 is organized by Indiana Trail Running Association (ITRA) and permitted by the Indiana Department of Natural Resources. ITRA is an association of trail runners and outdoor advocates committed to preserving, building, and running the beautiful trails in the state of Indiana.

The Start/Finish line is the Owen-Putnam State Forest Horse Campground. 4850 Fishcreek Rd, Poland, IN 47868. Beginning about 7:00 AM Saturday morning Zach KD9HIG will be monitoring 146.58 simplex and the Spencer Repeater 146.985 PL 136.5 for anyone en-route to the OPSF 50 50 in case directions are needed to your post or to answer any questions.

Zach KD9HIG will be on location there during shift changes. He will be wearing a yellow reflective vest with "Amateur Radio Emergency Communications" on the back. As Owen County PIO, he will also be touring around the OPSF taking pictures of amateur radio activities.

Road conditions near Owen-Putnam State Forest: The shortest route from Indianapolis has narrow gravel roads for the last few miles before Horse Campground. See the alternative route for better roads (this will add about 10 minutes to your trip).

Take I-70 W to exit 41, US-231 S. Head south through Cloverdale and toward Spencer to a slight right onto Rocky Hill Road. Turn right onto Cuba Road and continue until you reach a single lane bridge on the the right. Turn right over the bridge then immediately turn left onto Hale Hill Road.

Continue on Hale Hill Road for about two miles. Turn left onto Fishcreek road and Spencer, turn right onto E Hillside Avenue. Continue for about a mile then turn right onto IN-46. Turn right onto Fishcreek road. Continue for about 5 miles and Horse Campground will be on your left.

Please read the volunteer guide prior to the race and contact Zach Minick KD9HIG@yahoo.com, Mobile 765-848-8378 with any questions.

2023 HAMVENTION AWARDS ANNOUNCED

The 2023 Hamvention Awards committee for Dayton Hamvention® has announced this year's award winners.

The Special Achievement Award recipient is Dr. Jason McDonald, N2TPA

Dr. McDonald began a career as a radio frequency engineer before becoming a trauma surgeon. He brings amateur radio to the world through youth projects and Scouting, particularly through Radio Scouting.

He has helped form Scouting clubs around the world. To date, more than 500 youths in these clubs have become licensed and are on the air.

The Amateur Radio Club of the Year is the Delaware Valley Radio Association (DVRA). This ARRL Affiliated Club was formed in 1930 and serves the Trenton, New Jersey, area. DVRA has tripled in size over the last 6 years, due to the wide range of amateur radio activities and events they offer.

The Technical Achievement Award recipient is Dr. James Breakall, WA3FET.

As a Professor of Electrical Engineering at Penn State University from 1989 to 2022, Dr. Breakall developed cutting-edge antenna technology and mentored his students in amateur

radio. Through his mentorship, he inspired 700 of his students to become new licensees. Now a retired Professor Emeritus, he serves as a consultant to the Army, Air Force, and Navy on many antenna-related projects.

Amateur of the Year 2023 is Carsten Dauer, DM9EE.

For 30 years, Dauer has been active in European amateur radio through the World Radiosport Team Championship and Youth on the Air.

Recently, he spearheaded a movement that provides amateur radio equipment to Ukraine by collecting donations and personally delivering them.

You can read more about the 2023 Hamvention Awards at their [website](#) or at ARRL.org.

Dayton Hamvention® is May 19 - 21, 2023 at the Greene County Fairgrounds and Expo Center.
--ARRL

AMSAT RECRUITING ENGINEERING VOLUNTEERS

AMSAT is looking for an electrical engineer with RF experience to join its FOX-PLUS team. The team will be a collaboration of up to 10 electrical, mechanical, software, and systems engineer volunteers.

There will also be an opportunity to design and build the RF communications subsystems for a series of low-Earth orbit 1U - 3U CubeSats to support AMSAT's educational and engineering objectives.

Candidates should have working knowledge of analog and digital communications protocols (e.g., FM, PSK, and FSK) to provide digitally synthesized audio for FM modulated VHF/UHF/SHF voice and telemetry channels. Development opportunities can begin with modification of previous FOX designs and/or with an original design.

Mechanical engineers are also needed to join AMSAT's FOX and GOLF CubeSat teams. There will be a collaboration with an all-volunteer team of up to 12 electrical, mechanical, software, and systems engineers. The positions entail an opportunity to use structural design and analysis skills to develop a series of low-Earth orbit and highly elliptical orbit 1U - 3U CubeSats.

Contributions may include:

- The development of the space frame and deployable solar panel subsystem
- The analysis of the thermal characteristics of the CubeSat and the design of the thermal management system
- Preparation and oversight of the environmental testing procedure
- Management of documentation of the CubeSat's adherence to the launch provider's and space vehicle owner's specifications

AMSAT volunteers typically spend 5 hours per week on their projects and attend a weekly meeting online. An amateur radio license and CubeSat experience are helpful, but not necessary. US citizenship or proof of permanent residency is required.

Interested persons should send an email with their resume/curriculum vitae to volunteer@amsat.org. -- Thanks to AMSAT Assistant VP, Engineering Jonathan Brandenburg, KF5IDY, for the above information

ARRL WELCOMES KEVIN BEAL, K8EAL, AS THE DIRECTOR OF DEVELOPMENT

Kevin Beal, K8EAL, has joined ARRL staff as the Director of Development.

He has a significant background in nonprofit administration, and for the last 17 years, has managed large-scale projects and teams. His previous experience includes various roles supporting organizations and higher education institutions with program management, events, alumni engagement, and fundraising.

Beal has also worked on cybersecurity infrastructure training projects supported by the Federal Emergency Management Association (FEMA) and feels that amateur radio has significant value as an emergency communications tool.

With a father who was an electronics engineer during Vietnam in the US Army Signal Corps, Beal has been surrounded by radio his whole life. "I grew up in a household of spare electronics and communications equipment where at-home repair and soldering were commonplace," he said. He's excited to grow as a licensed ham and was thrilled to make a contact from the Hiram Percy Maxim Memorial Station as W1AW.

He joins ARRL after a career at his alma mater, Norwich University, from which he earned a bachelor's degree and a master's degree in international conflict management and resolution. As a cadet at Norwich University, he participated in the Naval and Marine Reserve Officers' Training Corps (NROTC) as a part of the cadre training new cadets, and he was a member of the Cavalry Troop.

Beal looks forward to getting to know ARRL donors. He and his wife live in Connecticut near ARRL Headquarters with their two daughters and their rescued hound. On most weekends during the winter, he can be found on the road taking his oldest daughter to her next hockey game. --ARRL Letter

TECHNICAL

COULD AI-FUELED AMATEUR RADIO REBUILD LORAN-C?

Loran-C was an incredibly reliable and accurate analog ground-based navigation system, operated by the US Coast Guard. Despite its impressive performance, it had some drawbacks, such as limited coverage, expensive infrastructure requirements, and the need to maintain a large number of radio stations in remote areas. Now with concerns over GPS jamming and hacking should we consider rebuilding the United State's once robust system of [Loran-C](#) stations?

Prior to its decommissioning in 2010, then-USCG [Commandant Thad Allen](#) proposed upgrading the system to [E-Loran](#), a digitalized and automated version of Loran-C that would provide improved accuracy and resistance to jamming and other forms of interference. However, due to a lack of Pentagon concern regarding a potential technology or space war with China and vulnerabilities to Russian hackers at the time, Congress did not fund the proposal and the old Loran stations were removed from service. In order to implement future upgrades, the entire Loran network of stations would need to be rebuilt.

Several countries, including the United Kingdom and Russia, have continued investing in developing E-Loran systems. However, despite the potential benefits of E-Loran, it has not been widely adopted and is not currently in use as a backup to GPS.

The death blow to E-Loran came due to a total lack of interest from Silicon Valley who in 2010 – before the advent of crowd-sharing networks like Uber – favored bits over atoms and mostly did not believe that tiny devices like a cell phones – which work on very short wavelength radio frequencies – could process the large wavelength transmissions of a high-frequency radio system like Loran.

Today however, high-frequency capable chips [are ubiquitous](#) – you can decode HF [navtex and DSD](#) signals [with a \\$30 dongle from Amazon](#) – and the benefits of E-Loran could be substantial.

What benefits? First and foremost is penetration. Right now phone use advanced processing and signal intelligence to [augment GPS](#) to provide a location when you enter a parking garage, building, or even hike in dense foliage. This is required because GPS signals use short wavelengths that don't penetrate structures very well. Loran signals – with their large wavelengths that travel great distances – do.

What's Better About Loran?

Some of the advantages of Loran-C over GPS were:

1. Better performance in high-latitude regions: GPS signals can be significantly degraded in high-latitude regions due to the geometry of the satellites' orbits. In contrast, Loran-C signals are not affected by the satellites' orbits and can provide accurate navigation information in high-latitude regions. This is increasingly important as Arctic security has become a top priority.
2. Higher accuracy for short-range navigation: Loran-C was initially designed for short-range navigation, and it could provide higher accuracy than GPS for distances of up to 1,000 nautical miles.
3. Greater resistance to jamming: GPS signals must use solar panels that can power only weak signals that are vulnerable to intentional or unintentional interference, such as jamming or spoofing. Loran-C signals, which can use hundreds of watts of power, were less susceptible to jamming or spoofing, making it more reliable in certain situations.
4. Availability of backup systems: Loran-C had redundant systems and could provide backup navigation information in case of GPS outages or failures.
5. Being a terrestrial system it can be better defended and repaired during a conflict with a space-equipped adversary like Russia.

In the United States, the Department of Homeland Security (DHS) conducted a [study on the feasibility of establishing an E-Loran system as a backup to GPS in 2008](#). The study concluded that E-Loran had significant potential as a backup system, but the implementation of the system would require significant investment and support from the private sector. Despite the promising results of the study, the E-Loran system was not implemented as a backup to GPS in the United States due to budget constraints and a lack of interest from the private sector.

Could The Loran System be Rebuilt?

With space savvy adversaries like Russia and China becoming increasingly aggressive the Department of Defense has started to reinvest in High Frequency communication systems. While the US Navy and US Coast Guard continue to have [limited interest in terrestrial based radio](#), the US Air Force is investing heavily in "old" radio systems. Just last year the [US Air Force, in partnership with BAE Systems, awarded a \\$176m contract](#) to Ham Radio manufacturer [FlexRadio](#) to return HF radio to the cockpits of it's aircraft and [Ukraine is using ham radios](#) to communicate behind enemy lines. What's old is new again but rebuilding the entire Loran system would require purchasing land, running millions of miles of cable, installation of new radio infrastructure, and training of personnel to operate and maintain the system. This cost would far exceed the few hundred million the USAF is investing in HF.

The Loran system could be rebuilt in densely populated areas with existing infrastructure for less but coverage would be limited. So is there a better way? by John Konrad, [K5HIP](#)

Ham Radio FT8

FT8 is a digital mode of communication used by amateur radio operators for making radio contacts over long distances. It was developed by Nobel prize winning physicist [Joe Taylor](#) (K1JT) and ham radio operator Steve Franke (K9AN) as part of the [WSJT-X software suite](#) for amateur radio communications.

FT8 is designed for weak signal communications and is particularly useful for making contacts under poor propagation conditions, such as during times of low solar activity or when

atmospheric noise is high. The mode uses internet synchronized clocks a fixed-length transmission of 15 seconds, during which the transmission is spread out over multiple subcarriers, providing a high degree of error correction.

FT8 is characterized by its highly automated operation, where the operator simply selects a frequency, sets the transmit power, and lets the software handle the rest. The software performs an exchange of information between the two stations, and the operator receives a confirmation of a successful contact.

FT8 has gained popularity among amateur radio operators due to its ease of use, high degree of error correction, and ability to make contacts over long distances under poor propagation conditions. It is commonly used for weak signal digital modes in the HF bands, such as 6 meters, 2 meters, and 70 centimeters. Today thousands of stations transmit time-synchronized FT8 signals from fixed stations around world that provide reach to every corner of the planet.

Don't build, Crowd Source

Building out a new E-Loran system would likely be too expensive for even the most well funded defense organizations like the DoD or NATO but, with Ham radio operators already emitting accurate time synchronized HF signals from fixed transmitting locations it's possible to triangulate a position already. The problem is noisy. Are all the clocks of these ham radio operators perfectly synchronized? Are they all transmitting from their stated locations? What if a HAM radio operator moves and doesn't update his position with the FCC or operates FT8 from a mobile RV or boat?

This is where AI could help. It is possible for AI to watch out for inaccuracies in the system. It could monitor stations over a long period of time and rate them on their accuracy and signal strength. It could flag and remove errant signals. This, of course, all requires a lot of processing power but each iPhone is more powerful than any supercomputer when GPS was invented.

The programing would be a challenge too but with a Nobel Laureate like Dr. Joe Taylor, intelligent Hams, equipment manufacturers like [FlexRadio](#) and [Elecraft](#), assistance from Apple and Google Oceans and DoD funding it should be possible to harness the system for navigational purposes and provide a redundant backup to GPS while allowing for better locational coverage for our phones.

Conclusion

In conclusion, rebuilding the Loran-C system is a feasible endeavor, albeit one that would require a considerable amount of investment, time, and expertise. This is not an insurmountable task, however, considering the most popular and revolutionary ship location tracking technology of today – web based AIS systems like Marine Traffic – already utilizes ham [radio receive stations around the world](#), and has proven to be a reliable and invaluable asset to the shipping industry. A radio-based navigation system like E-Loran would necessitate licensed and regulated radio transmitters, but luckily, thousands of these stations are already running FT8 on every continent, making it possible to crowd-source an HF navigational alternative to GPS, eliminating the need for the USCG to acquire land and maintain stations. And if the existing equipment isn't accurate enough, the US Navy and USCG could help [FlexRadio](#) develop new ham hardware.
--gCaptain

SHORTS

VOTA operations continue at a brisk pace, with tens of thousands of volunteer and W1AW portable contacts having been made. All points for VOTA scoring must come through Logbook of The World uploads. As announced in the January 2023 issue of QST, this is not a QSL card event (there will not be any W1AW portable state activation VOTA QSL cards issued from ARRL Headquarters). Please do not send W1AW portable VOTA QSL cards for VOTA contacts to ARRL Headquarters. W1AW portable VOTA QSL cards received by ARRL Headquarters will not be acknowledged.

The 6th Annual Amateur Radio Science Citizen Investigation (HamSCI) Workshop will be held March 17 - 18, 2023, in person at The University of Scranton and virtually via Zoom.

The workshop is open to students and citizen scientists, and all amateur radio operators are invited to attend. The theme of the 2023 HamSCI workshop is "Forging Amateur-Professional Bonds." The primary objective is to bring together the amateur radio community and professional scientists. This year, the workshop will feature a working special event amateur radio station using the call sign W3USR. In-person participants can stop by the station to operate or learn about how an amateur radio station works. The Murgas Amateur Radio Club, K3YTL, is organizing and running the W3USR special event station. The 2023 HamSCI workshop is organized by The University of Scranton with generous financial support provided by the United States National Science Foundation and Amateur Radio Digital Communications. HamSCI is an officially recognized NASA citizen science project. Registration for the in-person workshop is now open. and will close on Monday, March 6, 2023. Virtual participation is free of charge. For more registration information visit [HamSCI](#).

2023 Contest University Course Outline Announced - Tim Duffy, K3LR, has announced that the 2023 Dayton Contest University course outline and professor biographies are posted at <https://www.contestuniversity.com/>. Contest University will be held on Thursday, May 18, 2023, from 7:00 am to 5:00 pm, at the Hope Hotel in Dayton, Ohio.

Digital Library of Amateur Radio and Communications books and magazines is a treasure trove. If you are looking for a source for old callbooks or amateur radio magazines this is a great place to start: <https://hackaday.com/2023/02/20/digital-library-of-amateur-radio-and-communications-is-a-treasure-trove/>

There was a nice 6-meter F2 opening on February 16. I logged [the] HC1MD/2 grid FI57 on 50 MHz FT8 at 1916 UTC. I found this opening by checking the DXMaps website. HC1MD/2 had a strong, steady signal. I operated from home using an attic dipole antenna. I also logged HC2FG.

Other area 6-meter operators such as WQ0P (EM19) and KF0M (EM17) also worked stations in Chile. The K index was 4, which I suspect may have helped.

On February 18, a number of North American stations worked Robert Felicite, 3B9FR, around 1600 UTC on 6-meter FT8.

(3B9FR is on Rodrigues Island in the Indian Ocean, off the southeast coast of South Africa)

Conditions were great [during] the ARRL [International] DX CW Contest on 10 meters. I operated [for] a couple of hours [on] Sunday morning [while] running 5 W and a quarter-wave whip fixed mobile. [I] worked [more than one] hundred stations [between] Europe, the Caribbean, South America, and Africa. Many of the Europeans were over S-9."

March1 opening to Hawaii, New Zealand and Australia.

ARRL International DX Contest Log Upgrades are Now Available for HamDash. N3FJP's *ARRL International DX Contest Log 5.1.4* (for US and Canadian users) and the DX version (for users outside the US and Canada), *ARRL International DX Contest Log 3.7.4*, are now available. These upgrades include: Support for HamDash & Ability to sort the Notes list (Ctrl + H) by clicking on the column header. Upgrades are free for registered users. If you are running a version of the software released after January 2021, it will detect the new upgrade and offer to retrieve it for you. If you have any problems with the automatic upgrade, or if you are running an older version, you can install the latest version directly from the website at <https://www.n3fjp.com/intdx.html>

The General - Class Element 3 Question Pool Errata has been released. The National Conference of Volunteer Examiner Coordinators, NCVEC, Question Pool Committee has released the latest errata for the [2023 - 2027 Element 3 General question pool](#), which goes into effect on July 1, 2023. Nine questions were modified (G1B01, G1C01, G1C02, G5C02, G7C10, G9B05, G9C09, G9D09, and G9D10) and two questions (G9C06 and G9D13) were withdrawn from use. The [pool](#) is available as a Microsoft Word document and PDF. These changes are reflected in the new General Pool download file, dated February 1, 2023.

THANKS FOR READING

THE RCA ARC MONTHLY NEWSLETTER IS COMPILED AND EDITED BY JIM RINEHART, K9RU AND JIM KEETH, AF9A. ALL MATERIAL CONTAINED HEREIN IS OBTAINED FROM THE SOURCES CREDITED AND EDITED FOR THIS NEWSLETTER.
