CAARA NEWS

Cape Ann Amateur Radio Association
Gloucester, Massachusetts
MAY 2022 EDITION

PRESIDENT'S COLUMN

by Brandon- NQ1W

Dear Members,

Spring is finally here! Which means road race contests have started. I love participating in these - getting outside into the fresh air and providing a public service. It's been a joy to see so many of our friends from the nets showing up to staff positions along the course or supporting their friends who are. Fred WA1ESU has been doing a great job running the net control operations. If you are interested in helping out, even if only for one event, send him a message at wa1esu@comcast.net, and he will set you up at great locations across our beautiful Cape Ann vistas.

We are also back to holding events at the club house. In the spirit of seeing even greater attendance at these demonstration and training events, could you please share with me topics or activities you would personally enjoy coming to the clubhouse for? Send your suggestions or comments to president@caara.net, and I will do my best to reply to all submissions.

Finally, I am planning an outing in late May outside at Hospital Hill in Rockport, MA to grill and do radio together. Details will be announced shortly. And please let me know if you want to be involved in the planning with me.

I hope everyone has a chance to get out and do something radio related as the weather is getting nicer!

Regards,

Brandon NQ1W

President CAARA

THE EMCOMM MINUTE

By Dean- KB1PGH

I hav been trying to think of what I have not covered in all these years of doing the monthly newsletter articles so I went looking at my ham radio stash and I noticed I haven`t covered Anderson Powerpole connectors. Since I work HF portable all the time I have used them since the beginning for both AC and DC applications. I`m always swapping back and forth between generator and battery power to power my portable set up.

I like anderson powerpoles because they are pretty much foolproof with their black and red colors so you can`t mix up your negative wire from your positive current wires. Not to mention these ease of plugging them together for set up and unplugging them for tear down. Plus I can hook up any radio quickly to any power source as well as RigRunners and things like that. Anderson Powerpoles are also used in lot of RC cars and trucks and the model railroad hobby and the higher amp connectors are used in solar panel arrays. I also wanted to talk about anderson powerpoles because they are the preferred connector system for ARRL ARES.

One other incident spurred me on to write about anderson powerpoles because in my car I used them for my 2 meter /440 rig which I power directly from the car battery. The only problem is I can`t get a wire through the firewall so it goes through the side and the wires connect by the front door so I had hit them with my boot getting out of the car and loosened the powerpole connector from the wire which was a pain to fix because I did not have the right tools. This incident motivated me to get the right tools to repair and install new anderson powerpole connectors. So here are the tools you need to fix and install powerpole connectors. As you can see in the photo we have a basic

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6 Stanwood Street
Gloucester, MA 01930

CAARA Newsletter is a monthly publication of the Cape Ann Amateur Radio Association (CAARA).

It is the policy of the editor to publish all material submitted by the membership provided such material is in good taste, relevant to amateur radio and of interest to CAARA members, and space is available. Material is accepted on a first come, first serve basis. Articles and other materials may be submitted by internet to Jon at jpcrockport@gmail.com . If possible, material should be in Word format. Material may also be submitted as hard copy to Jon-K1TP or any Club Officer.

The opinions expressed in the CAARA Newsletter are solely those of the editor or other contributors and do not necessarily reflect the opinions of either the Board of Directors or membership of CAARA.

Jon Cunningham- K1TP Editor
Dean Burgess- KB1PGH Reporter

Welcome to CAARA:

CAARA, an ARRL affiliated club, operates the 2 meter W1GLO repeater on 145.130 MHz with antennas located on the ATT cell tower in the Blackburn Industrial Complex in Gloucester Massachusetts. It has an average effective radius of 60 miles, and serves Eastern Massachusetts, Cape Cod, Rhode Island, Southern New Hampshire, and maritime mobile stations.

CAARA also operates the W1GLO repeater on 224.900 located at the CAARA clubhouse.

The 443.700 repeater is now on the ATT cell tower in the Blackburn Industrial Complex with greatly enhanced performance running in fusion mode and linked to 10 other repeaters in the New England area.

The Association is one of the few amateur radioclubs that has its own clubhouse. Located at 6 S tanwood Street in Gloucester, with a variety of HF stations with beam, vertical, or G5RV antennas.

Amateur radio exams are held on REQUEST at the CAARA clubhouse. Anyone who is considering a new license or an upgrade, is welcome to test with us. Currently pre-registration is necessary. Contact the head of our VE team Bill Poulin- WZ1L if you have any questions about monthly testing.

Monthly member meetings are held on the second Saturday of each month at noon except for July and August.

Each Sunday evening at 9:00 PM, the club operates a 2 meter fm net on 145.130. This is an open and informal net which disseminates club news and prepares operators for emergency communications work. All are invited to check into the net as club membership is not a requirement.

The club is open every Tuesday from 5- 8PM for CAARA members to stop by and socialize, as well as use the extensive collection of ham radio gear.

wire stripper in the middle with the red handle for about $10.00. Next is the most expensive item and that is the Tri Crimp crimping tool from Powerwerx with the orange handle on the left side of the photo. It costs $45 but it`s worth every penny. It`s not just a regular basic crimper. It`s built especially to crimp powerpoles. It has a built in metal die with a contact positioner that holds the powerpole connector in place while you crimp it on and you`ll know it`s a tight enough crimp because it automatically releases itself.

The next item you see in the photo is the powerpole insertion and extraction tool with the yellow handle which costs $10.00 . This small tool saves you the hassle of getting the crimped wire into the connector and can release the spring inside of the connector to get the old wire connector out.

These tools will crimp wires for 15 amp,30 amp and 45 amp loads as you see the 15 amp wire connectors in the photo as a example. Here`s a couple of tips if your going to buy these tools and connectors. Please try to avoid the Chinese knock off connectors on Amazon. The red and black connectors tend not to click together well. If you go on Amazon get the "Valley Enterprises" connectors. They are the real deal. You can also get the real ones at www.powerwerx.com . They sell all the tools and you can get real fancy and buy the whole set up in it`s own carry case.

When you order the anderson powerpoles make sure you order the black locking pins to hold the black and red connectors together. You can also order the retention clips that will hold the connections together. You can see these in the photo I provided. They do sell caps to put on the end of the anderson powerpoles to keep the dust and dirt out as well. These connectors in the photo are for most amateur radio applications but anderson powerpoles also make connectors all the way up to 350 amps. You can also find and use different color connectors as well other than the red and black if you want. If your looking for pre made dc power cable runs for your equipment that have the anderson powerpole connectors on them you can go to www.powerwerx.com , www.westmountainradio.com and www.qsradio.com . You can also order whatever length power cable you want.

One tip for DC power cable runs try to keep the cable runs as short as possible between your rig and the power source so you don`t get the amp and voltage loss. Your battery may be 12 volts out and your power supply may be 13.8 volts out but he voltage will be lower at your rig with a long power cable run. I always use 10 gauge wire which is thicker so I won`t lose as much voltage or amperage. Since we are talking about the proper feeding of power to amateur radio rigs here`s another tip. Make it a note to to check your fuse holders for corrosion and oxidation on the contacts. This especially applies to the cheap factory power cables with the fuse lines built in. Over time a layer of oxidation will build up inside the fuse holder and you will end up getting power loss before the radio. Just take the fuses out and scrape the blades and the blade contacts and shine them up a bit.

One other tip. Especially since I operate HF portable . Always make sure that you have extra fuses on hand in case they pop. I just keep a small bag of both the small and regular size blade fuses with all different amp limits in my portable kit. Don`t forget that some HF rigs like my Icom 7300 have internal fuses as well so make sure you got back ups for those as well. There`s one last reminder. If you are a ARRL member you can sign up and get the ARRL ARES letter. It gives a few bits of emergency communications news around America and the world. There`s a bunch of emcomm related links as well. It`s a pretty good resource. That`s it for now and I will see you next month, 73

Octogenarian radio ham making solo voyage across Pacific

83-year-old radio amateur Kenichi Horie JR3JJE is using ham radio during his solo journey across the Pacific in his yacht the Suntory Mermaid III

The Asahi site reports:

Octogenarian Kenichi Horie, who aims to become the oldest solo voyager to cross the Pacific, passed Hawaii on April 17, a week ahead of schedule and apparently in good shape and spirit.

Amateur radio fans across Japan tried to communicate with Horie on April 1, with some setting up large antennas. But they could not reach him due to the poor conditions for radio wave transmission.

The following day, some could.

ARISS contact is scheduled with students at Bellefontaine High School, Bellefontaine, Ohio, USA

Amateur Radio on the International Space Station (ARISS) has received schedule confirmation for an ARISS radio contact between astronauts aboard the International Space Station (ISS) and U.S. students at the Bellefontaine High School in Bellefontaine, OH. ARISS conducts 60-80 of these special amateur radio contacts each year between students around the globe and crew members with ham radio licenses aboard the ISS.

Bellefontaine High School (BHS),is a rural, public high school (about 900 students, ages 13-18years) about 50 miles northwest of Columbus, Ohio, in Logan County. BHS's STEM curriculum supports the school's various academic extracurriculars and clubs which include Envirothon, TEAMS (Tests of Engineering Aptitude, Mathematics, and Science), Robotics and their newly formed Bellefontaine High School Amateur Radio Club,call sign W8BCS. Members of the local amateur radio club (W8BCS), the Champaign Logan Amateur Radio Club (CLARC), are providing technological aid and promoting amateur radio to the students as a co-sponsor for radio license classes and license testing. During the school year student activities have used the ARRL curriculum resources, which allow teachers to introduce space-related technology to the classroom. Students also participated in their'Design Challenges' – a program that allows students the opportunity to design various "contraptions" to achieve a task under certain constraints (as would occur in aerospace engineering) to further their understanding of space technology.

This will be a direct contact via Amateur Radio allowing students to ask their questions of Astronaut Kayla Barron, amateur radio call sign KI5LAL. Local Covid-19 protocols are adhered to as applicable for each ARISS contact. The downlink frequency for this contact is 145.800 MHZ and may be heard by listeners that are within the ISS-footprint that also encompasses the relay ground station.

The amateur radio ground station for this contact is in Bellefontaine, OH. Amateur radio operators will use call sign W8BCS to establish and maintain the ISS connection.

Questions that will be asked:

1. How long does it take to get used to gravity after being in space?

2. Can you throw objects, like a football, on the ISS?

3. How close are you to the moon, sun, or earth right now?

4. How do you train to keep healthy in space?

5. What is the weirdest thing you have ever encountered in space?

6. How long can you stay in space?

7. What is the protocol if depressurization occurs on the ISS?

8. Who inspired you to go to space?

9. What happens if someone breaks a bone or gets injured in another way on the ISS?

10. Aside from a clock, how do you know if it is day or night in space?

11. Do you have a tracking device in case an asteroid hits the ISS or another planet?

12. What does the earth look like from the ISS?

13. How does space affect our motor skills?

14. What are some of the side effects of spending long durations in space?

15. What is your favorite part of being in space?

16. What resources do you have available on the ISS if something breaks?

17. What is the hardest thing about going to space?

18. How long and how hard did you have to train in order to be able to go to space?

National Voice of America Museum during 2022 Hamvention

The National Voice of America Museum of Broadcasting in conjunction with the West Chester Amateur Radio Association announce expanded hours for the museum during the 2022 Dayton Hamvention.

The Museum will be open for the following; Thursday May 19th from 1:00 to 9:00PM, Friday May 20th from 1:00 to 9:00 PM, Saturday May 21st from 1:00 to 9:00 PM and Sunday May 22nd from 1:00 to 5:00 PM. Admission is $10.00 at the door. The WC8VOA Amateur Radio station will be available to operate during these times. The Museum is a short drive from Hamvention down either Interstate 75 or Route 42 from Xenia. GPS use Crosley Blvd.

Exhibits include the Robert Drake collection of radios and the recently restored WLWO (W8XAL) transmitter. This transmitter was used to provide the very first broadcast of the Voice of America into occupied Europe on February 1st, 1942. A completed diorama showing antenna configurations of the original operation which occupied nearly one square mile is also on display. Docents and ARS operators will be available to enhance your visit to the museum.

For further information you can visit us at voamuseum.org or wc8voa.org on the web.

You can also find us on Facebook at National Voice of America Museum of Broadcasting. The Museum's regular hours are Saturdays and Sundays 1:00 until 4:00 PM. The Museum is located at 8070 Tylersville Road, West Chester, Ohio 45069.

Below is a picture from NEARFestXXXI. Here is Kevin K1KL, Marwan W1BEY, and Brandon NQ1W checking out Marwan's booth where Kevin and Brandon got a cool lesson on drone aircraft from the very knowledgeable W1BEY.

There were many CAARA members in attendance Friday and Kevin and Brandon got to also meet with Fred and Anita Kemmerer (AO1BC & AO1QB) our ARRL New England Division Director and Assistant Director. Who gave us some great advice on our upcoming grant proposal to the ARRL. All in all a very productive hamfest for CAARA!

APRIL MEMBER MEETING

The member meeting featured Neil talking about digital communication. An interesting talk and we only wish more members would start coming to the meetings now that Covid restrictions have loosened up. We ask all members attending the club events be vaccinated and masks are optional.

ODDS AND ENDS: Cutter bought and replaced door closer's for the front screen door which was damaged in a wind storm. The club was cleaned by a few board members who showed up early and washed and disinfected tables and cleaned the bathroom and kitchen area. This is done before every Board and Member meeting for your safety.

VE testing above and beyond the call of duty. A lady in Rockport asked the BOD if she could get tested for a Tech test. She has no transportation so Bill- VE Team leader, Jon- K1TP, and Jim- W0ZEN arranged to give her the test at the Rockport Public Library. Jon picked her up at her house and took her to the library where she passed the test. Congratulations! She will be at the May meeting and would like to meet the members, see the clubhouse, and an also figure out which handheld to buy to use the repeater…and she wants to learn the Morse Code.

FCC Hiring for Electronics Engineering

The Federal Communications Commission (FCC) has started accepting applications for electronics engineers for Recent Graduates positions in the Pathways Program which is located in the Office of Engineering and Technology in Washington, DC. Candidates should be recent graduates for this one year developmental program which may lead to a term or permanent appointment.

Training will cover the agency's policy and rulemaking processes, technical training for a wide variety of telecommunications services and technologies, and training on engineering and policy principles relevant to the fast paced telecommunications industry. Additional duties, and related training, may also include performing propagation analysis of terrestrial, satellite and/or airborne systems or evaluating the emission characteristics of various transmitters to validate the co-existence with neighboring systems.

W1AW 2022 Spring/Summer Operating Schedule

Morning Schedule:

Time Mode Days

1300 UTC (9 AM ET) CWs Wed, Fri

1300 UTC (9 AM ET) CWf Tue, Thu

Daily Visitor Operating Hours:

1400 UTC to 1600 UTC - (10 AM to 12 PM ET)

1700 UTC to 1945 UTC - (1 PM to 3:45 PM ET)

(Station closed 1600 to 1700 UTC (12 PM to 1 PM ET))

Afternoon/Evening Schedule:

2000 UTC (4 PM ET) CWf Mon, Wed, Fri

2000 " " CWs Tue, Thu

2100 " (5 PM ET) CWb Daily

2200 " (6 PM ET) DIGITAL Daily

2300 " (7 PM ET) CWs Mon, Wed, Fri

2300 " " CWf Tue, Thu

0000 " (8 PM ET) CWb Daily

0100 " (9 PM ET) DIGITAL Daily

0145 " (9:45 PM ET) VOICE Daily

0200 " (10 PM ET) CWf Mon, Wed, Fri

0200 " " CWs Tue, Thu

0300 " (11 PM ET) CWb Daily

Frequencies (MHz)

CW: 1.8025 3.5815 7.0475 14.0475 18.0975 21.0675 28.0675 50.350 147.555

DIGITAL: - 3.5975 7.095 14.095 18.1025 21.095 28.095 50.350 147.555

VOICE: 1.855 3.990 7.290 14.290 18.160 21.390 28.590 50.350 147.555

Notes:

CWs = Morse Code practice (slow) = 5, 7.5, 10, 13 and 15 WPM

CWf = Morse Code practice (fast) = 35, 30, 25, 20, 15, 13 and 10 WPM

CWb = Morse Code Bulletins = 18 WPM

CW frequencies include code practices, Qualifying Runs and CW bulletins.

DIGITAL = BAUDOT (45.45 baud), BPSK31 and MFSK16 in a revolving schedule.

Code practice texts are from QST, and the source of each practice is given at the beginning of each practice and at the beginning ofn lternate speeds.

On Tuesdays and Fridays at 2230 UTC (6:30 PM ET), Keplerian Elementsfor active amateur satellites are sent on the regular digital frequencies.

A DX bulletin replaces or is added to the regular bulletins between 0000 UTC (8 PM ET) Thursdays and 0000 UTC (8 PM ET) Fridays.

Audio from W1AW's CW code practices, and CW/digital/phone bulletins is available using EchoLink via the W1AW Conference Server named"W1AWBDCT." The monthly W1AW Qualifying Runs are presented here as

well. The CW/digital/phone audio is sent in real-time and runs concurrently with W1AW's regular transmission schedule.

All users who connect to the conference server are muted. Please note that any questions or comments about this server should not be sent via the "Text" window in EchoLink. Please direct any questions or comments to w1aw@arrl.org .

In a communications emergency, monitor W1AW for special bulletins as follows: Voice on the hour, Digital at 15 minutes past the hour, and CW on the half hour.

CAARA PUBLIC SERVICE- PROVIDING COMMUNICATIONS FOR THE SAFETY OF YUKAN RACE RUNNERS

Fred-WA1ESU, our new CAARA Public Service director at the first race of the season.

Hanging at the End of the Supply Chain

by Curtis-*AA3JE*

I blame Henry David Thoreau, actually. When in college, an impressionable age, I read "Walden" and was taken by the lyrical descriptions of a simple life in the country, appreciating the natural world, being separate from the distractions and corruption of urban life. It really made an impression on me.

So, in retirement, having observed that most of Massachusetts had either been paved, turned into a strip mall, or filled with million dollar McMansions, I turned my face north to the mountains, which have attracted disenchanted (and ill prepared) southern citizens for over two centuries.

The White Mountains, formed a hundred million years ago, carved up by the last glaciation 20,000 years ago, are a large natural barrier in the middle of New Hampshire, pierced here and there by two lane roads, and by a quirk of nature are home to the worst weather on Earth, barring Antarctica. Unknown to me, climbers practicing for Everest expeditions go to the Whites to get in shape for the big ones.

So, being only so crazy, I bought a retirement home on the side of a mountain, north of the mountains, in the river valley between the Whites to the south and the Greens to the north. The pictures on Zillow were taken on a sunny day in August, showing a great expanse of waving grass rimmed by lush forest, with a view to die for.

No one explained the supply chain problem. Now I am a modern man, used to clicking on an entry on Amazon, and two days later, a happy brown box with a smile on it is dumped in my driveway. So when I went to the store for groceries, I expected the same.

"Do you have any baked beans?"

"Oh no, Margie came in and cleaned us out."

"When will you get any more?"

"Maybe Tuesday, not sure. Deliveries have been difficult. We're trying to buy in Canada."

But then some truckers got their knickers in a knot over COVID vaccinations, and no trucks from Canada.

A trip to the grocery store became an exercise in advanced foraging.

"WHAT IS THIS?"

"Baked pinto beans, very popular in the Southwest."

"Got any meat?"

"Sure, see the service counter. We need to run a credit check before we sell you any."

I discovered that the wise shoppers asked a friend who worked in the store on likely delivery times, and staked out the parking lot. When a semi arrived, which was rare, they rushed in from the parking lot and mobbed the guy wheeling the cart from the back. If you did that, you could get toilet paper.

Hardware was worse.

"You got any 3 conductor 10 gage waterproof?"

"Naw. Sam might have some."

"Sam?"

"Go down Meadow Street fifteen miles past the shopping center, look on the left, just past the gravel pit."

"Can I call and ask?"

"Oh he stopped answering the phone two weeks ago. Too many people calling."

My neighbor's solution has been to wind down to a 19th Century life style. Wood heat, oil lamps and three acres of truck farming.

Makes you think.

Foundations of Amateur Radio

After the chaos ... building the ideal shack

One of the first questions a new amateur asks is "Which radio should I buy?" It's a topic I've discussed at length and the answer "It depends." is unhelpful without doing more research, but after you've done the work, you'll be able to answer it for yourself.

A question that is just as important, but not asked nearly enough, frankly, I've not heard it in the decade I've been part of this community, is: "How should I build my shack?" The answer is just as useful, "It depends."

So, let's explore what precisely your shack design depends on. Let me start with pointing out that I'm not here to give you answers, you can watch hundreds of YouTube videos, read a gazillion web-pages and get no closer than discover how others have answered this question. It wasn't until recently that I understood that it was a question at all, but airing my frustration at the level of dysfunction of my shack unearthed it and in attempting to answer my own question, I started to explore the landscape.

As with choosing a first radio, one of the very first answers you need for yourself about the ideal shack is: "What do you want to use it for?"

That in and of itself is not enough. I had an answer for that, I want to operate my weekly net, I want to do casual HF contesting, have a beacon running and have space for experimentation. It wasn't until Ben VK6NCB suggested that I dedicate a single radio to the weekly net and the contesting and use the other for experimentation, that I discovered that this wasn't going to work for me.

I want to be able to use both my radios at the same time, in a so-called Single Operator Two Radio setup, or SO2R. This will allow me to extend the boundaries of my comfort zone and in doing so, will give me plenty of new things to learn.

So, the question: "What do you want to use your shack for?" is probably the single most important thing you need to discover. If you're like me, the obvious answer is: "Everything!", but reality soon sets in and you might start to create an actual list of things that you want to do. Prompted by Ben's suggestion, I was able to articulate for the very first time something that I didn't want to do. I didn't want to set a radio aside for experimentation. So when you're considering what you want to achieve, also think about what you don't want.

For example, I have no interest in using the 6 meter band at this time. Not because it's a bad band, far from it, it's because I'm not permitted to use it with my current license. Same for the 23 cm band. This means that I don't have to find ways of making my shack accommodate those two bands. My current license permits me access to precisely six bands and the station I'm building only needs to access those bands at the moment. That brings me to the next question for the ideal shack design.

"How long do you expect the layout to last?"

For example, are you going to build a new building for your shack, for the next 50 years, or is it something that's going to last for the weekend? Is your shack going to be moved, or is it something a little more permanent? Are you going to change your needs and should you incorporate some of that into your design, or are you perfectly happy with what you're doing today? You have to remember, this is your shack, not mine, not your friends, yours. It means that it needs to accommodate what you want.

The next question, boring as it might be, "How much money are you going to spend?"

Building a whole new shack out of a catalogue is perfectly fine, but you might discover that the gear you have today is ample to get your shack started. You might leave space for a different piece of kit, or you might decide that the shack needs changing when a new shiny piece of equipment arrives in a nondescript brown box.

Some other things to consider are, "What operating actually looks like?"

I've seen shack videos that look like a tour through a radio museum with more radios than I have keys on my keyboard, sometimes all connected, other times, just stored on shelves to look at.

Are you going to have more than one radio operating at the same time and if so, how are you planning to control them? How many antennas are connected to this shack and how do you track which antenna is connected to which radio?

What are you going to do about power? Does everything run on mains power, or are you going to build a 13.8 Volt supply for all your gear?

Where are you planning to put computer screens, what about keyboard, mouse, Morse key and antenna switching controls? In other words, "What do the ergonomics of your shack look like?"

Remember, there is no right answer. The answer you come up with is yours and yours alone. Look at things that work for you and take note of things that make you wince when you see it in another shack somewhere. That's not to say that you should be dismissive, rather, use the opportunity to ask the shack owner why they made that choice. Who knows, it might cover something you hadn't considered yet.

So, what does your ideal shack look like?

I'm Onno VK6FLAB

SURPLUS CLUB EQUIPMENT AVAILABLE

Immediately after the next CAARA Board of Directors meeting, scheduled to be held on May 14, 2022, the Equipment Committee will make available on a first-come first-serve basis a table of free equipment and parts. Any current member in good standing will be able to come to 6 Stanwood St. to examine and take away what they want for their own personal use. These are items that were either donated or obsoleted that the club cannot use and the Equipment Committee does not want to try to sell. All items are being offered strictly on an as-is basis.

We will not be reserving or otherwise releasing or setting equipment aside before making the table of equipment available at the end of the BoD meeting. If it's on the table it is available to be taken and should be removed from the building immediately.

As a simple reminder BoD meetings are open to any club member. They normally finish at approximately 12 noon.

REMOTE STATION AT CLUB

The CAARA Equipment Committee is pleased to announce a trial offering of a remote operations station to our members using the Remote Hams https://www.remotehams.com software. Licensed amateur radio operators subscribe to the service, and both individuals and groups provide access at their discretion stations open for either public or private use.

We will be making available a station to club members who have been a member in good standing for the previous 12 months, for what we expect will be a 1 year trial period after which the CAARA Board of Directors will review to make this a permanent offering. It should be noted that the Remote Hams service is globally oriented so licensed amateurs who participate in the Remote Hams service by extension are also free to use any other station participating in the service whose owner is willing to authorize their use.

We are offering the service on an as-is where-is. There is no service level in place regarding uptime, reliability, suitability for use, security, time to repair if there is an equipment failure, or availability. You are responsible for providing your own computer and internet

connectivity that meets the Remote Hams requirements to run the client software. No claim is made regarding the peaceful coexistence of the Remote Hams application with other applications on your computer.

Access is ad-hoc and neither the Equipment Committee nor the Board of Directors will broker access to the service but we will at least initially place a per-member restriction of 2 hours of use per day. We reserve the right to modify that restriction depending upon usage of the service. Abuse of the service may lead to corrective action taken.

Because the CAARA service relies upon the Remote Hams service, if Remote Hams discontinues their offering our service will also be discontinued until such time as the Board of Directors authorizes a suitable alternative.

While the intent is to at least offer the service in good faith at least for the next 12 months the Board of Directors may at any time decide to update restrictions on use or to terminate the offering.

Operational guidelines:

This will be a free service during this 1 year period. The only requirements to be approved for the CAARA offering are to be authorized by the Remote Hams administrators to use their service and to be a current member of CAARA in good standing who has been a member of the club for the previous 12 months.

Only voice modes are supported. We will be able to accommodate authorized members who hold an active US Novice or Technician class license as they can legally operate 28.3-28.5 MHz SSB Voice.

The club waives for this specific use the normal requirement that club stations be operated using the club license W1GLO. Members shall operate the service using their own callsign, and as the control operator must operate only within the privileges granted for their license class.

Accounts are not to be shared. Any member found to be sharing their account with other members or with non-CAARA members will be banned from access to the club station.

As noted above, we are initially placing a soft restriction of 2 hours use per day in order to give all authorized members a reasonable opportunity to use the CAARA service, which may be revised up or down as needed. Idle timeouts have been configured to inhibit idle camping on the station. Please not that this restriction will not impact a users ability to access other stations that participate in the Remote Hams community; for example one could use the CAARA station for 2 hours and then immediately look for and use another station that will grant them access.

Users must create an account at https://www.remotehams.com and share the user name (only the user name, not the password) with Larry AJ1Z at kb1vmr@gmail.com so that the Equipment Committee will know of an incoming access request via the Remote Hams client and Larry can update when your access has been enabled along with the specifics needed to connect to the W1GLO station. While not required to use the CAARA offering it is recommended that you use your callsign as your login name as some other participating stations do require it as a condition to get approved for use.

The Remote Hams website also provides the client application binaries, supporting documentation, and technical support via their online forum. We will provide specific information necessary for an authorized user to connect to the service but will not install, configure, or modify software on computers or otherwise provide technical support, although some members may voluntarily choose to provide guidance based upon their own experience.

The station will generally prioritize remote operation vs. physical operation at 6 Stanwood St. but the service may not be made available during events that CAARA is a participant, such as Field Day or Winter Field Day. There may be periods of unavailability before, during, or after such events.

The Equipment Committee may make modifications to the station or service level without prior notice. Emperically we expect the most likely scenario is a change of antenna but in general such modifications are expected to be tied to an attempt at service improvement.

The current station is an ICOM IC-7300 with autotuner with a G5RV Jr. antenna supporting operation on the 10-40 meter bands. The station as currently configured supports 10-40M operation.

Foundations of Amateur Radio

The Science of Amateur Radio

The amateur radio community is as varied as humanity across the globe. It represents an endless supply of ideas and experiments that continue to attract people looking for something new and exiting.

On the face of it, our hobby is about radio and electronics, about propagation and antennas, about modes and contacts, but if you limit your outlook to those topics you'll miss out on a vast expanse of opportunity that is only just beginning to emerge.

Until quite recently, computing in amateur radio was essentially limited to logging and contest scoring. It has evolved to include digital modes like PSK31 and the advent of smaller, faster and cheaper computers in the home has brought the possibility of processing unimaginable amounts of data leading to modes like WSPR and FT8.

In the past I've spoken about how amateur radio means different things to different people. Making contact using a digital internet enabled repeater is sacrileges to one and manna from heaven to another. Between those two extremes there is room to move and explore. Similarly where one uses valves, another expects an integrated circuit. One wants low power, the other wants every Watt they can lay their hands on. Contesting versus rag chewing, nets vs contacts, SSB vs. CW, FT8 vs. RTTY. Each of these attracts a different part of the community with different outcomes and expectations. For some it's about antenna building, others going portable, climbing a mountain, or setting up in a park.

Those are all traditional amateur activities, but the choice and opportunity don't end there.

The longer I play with computers the more I see a convergence in the world, a coming together of technologies and techniques. I've talked about some of this before when in 1994 I produced a competition broadcast promotion for the radio station I was working at, using just a computer in the era of reel-to-reel tape and razor blades. My station manager couldn't quite put his finger on what was different, but with hindsight it represented a landslide change in how radio stations have operated since. Mind you, I'm not saying that I was the first, just the first in that particular radio station.

In many ways computing is an abstract effort. When asked, I like to express it as designing something intangible in an imaginary world using an made up language and getting paid real money to make it happen, well, numbers in my bank account at least.

Within that context, amateur radio is slowly beginning to reap the rewards that come from the exponential growth in home computing power. While the majority of humanity might use the vast amount of CPU cycles to scroll through cat videos online, that access to processing power allows us to do other things as well.

For example, right now I'm playing with the dataset that represents all the WSPR spots since March of 2008. As of now there are around four billion rows of contacts, containing data points like a time-stamp, the transmitter, the receiver, the signal strength, location, direction, and more.

As part of that investigation I went looking for documents containing the words "RStudio" and "maidenhead", so I could consider creating a map in my statistical tool that allowed me to represent my dataset. In making that search I discovered a thesis by a mathematician who was using the reverse beacon network in an attempt to predict which station could hear which transmitter at what time.

In reading the thesis, which I opened because I was looking for an example on how to convert a maidenhead locator into geo-spacial data types in R, a popular statistics platform, I discovered that the author didn't appear to have much, if any, amateur knowledge or experience, but they approached their task, attempting to predict

as a mathematician what we in our community call propagation, based on a public dataset, downloaded straight from the reverse beacon network, created by amateurs like you and I.

This interaction between science and the amateur community isn't new. Sometimes it's driven by science, other times it's driven by amateur radio. There's a team exploring the ionospheric prediction models that we've used for decades, popularly referred to as VOACAP or Voice of America Coverage Analysis Program, based on multiple evolutions of empirical models of the ionosphere that were first developed in the 1960's, headed by both a scientist and an amateur, Chris KL3WX.

With the advent of WSPR and the associated data collection some experiments have started to compare the reality of propagation as logged by WSPR to the predicted propagation as modelled by VOACAP. One such experiment happened in 2018 where Chris and his team at HAARP, the High-Frequency Active Auroral Research Program, set out to make transmissions at specific times and frequencies, using the amateur community logging of WSPR spots to compare their transmissions to the predictions.

Interestingly they did not match. Just think about that for a moment. The tool we love and use all across our community, VOACAP, doesn't match the reality of propagation.

My own playing with WSPR data is driven by the very same thing that I use to be a better contester, a burning curiosity in all things. My VOACAP prediction experience has been poor to date. Setting up my own WSPR beacon is the first step in attempting to discover what my actual propagation looks like, but in doing so, it's also a possible contribution to the wider challenges of predicting propagation based on a dataset with four billion spots. One such approach might be to create an ionospheric prediction map based on actual data and compare that to the models as well as the published space weather maps and combining these efforts into a machine learning project which might give us the next generation of ionospheric prediction tools, but only time will tell.

No doubt I will have to learn more about statistics and machine learning than I expect, but then, that's half the fun.

So, next time you think of amateur radio as being limited to valves, transistors, soldering, antennas and rag chewing on HF, consider that there might be other aspects to this hobby that you have not yet considered.

What other research are you aware of that relates to amateur radio?

I'm Onno VK6FLAB

Radio amateurs to participate in MARS Interoperability Exercise in May

Members of the Military Auxiliary Radio System (MARS) will conduct an HF skills exercise from Monday night, May 2 through Saturday, May 7, 2022 to practice interoperability with the amateur radio community.

A 60-meter high-power broadcast will begin on May 3 at 0200 UTC followed by the FEMA region net. That will continue four more nights at 0200 UTC with the region net. At 1200 local each day (May 3 – 7; Eastern, Central, Mountain, and Pacific) the net will be called by region. See slide (PDF).

MARS members will be reaching out to the amateur radio community via the 60-meters Channel 1 Net (5330.5 kHz). These are directed nets. The nets will be run by region. These are not typical "everyone check into the net" operations. Amateur ops who participate should listen first. Net control will ask for stations meeting specific criteria to check in, e.g., stations in a particular geographic area. Only stations that meet the criteria should check into the net.

In addition to 60 meters, MARS stations will also reach out on amateur frequencies such as 80-meter traffic nets and other bands they may be able to reach.

Thanks to Rob Hurd, N3HU and Chief Army MARS Paul English, WD8DBY

Amateur Radio Newsline Report

BOSNIA'S EARTHQUAKE BRINGS RAPID RADIO RESPONSE

DON/ANCHOR: We begin this week with a deadly earthquake in the Balkans - and a rapid response from area amateurs. Ed Durrant DD5LP has that report.

ED: Hams responded quickly in Bosnia-Herzegovina following a deadly earthquake with a magnitude of 5.7 that struck late on Friday, April 22nd. As hundreds fled their homes, one person was reported dead and at least three others were injured, according to some news reports. IARU Region 1 Emergency Communications Coordinator Greg Mossop GØDUB reported that within minutes, the Association of Radio Amateurs of Bosnia and Herzegovina activated its emergency communications service and hams were mobilised. E70ARA established digital connections between Sarajevo and Zenica using Winlink and also set up a network using UHF and VHF repeaters including portable cross-band equipment. On HF, digital and voice modes were being used on 80m and 40m.

Meanwhile, ongoing reports on the situation were sent via Winlink using the IARU message format. The emergency networks stayed in place until the danger from aftershocks had passed.

(IARU REGION 1, SOUTHGATE, ASSOCIATED PRESS)

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FCC SEEKS COMMENT ON IMPROVING RECEIVERS' REJECTION OF RFI

DON/ANCHOR: In the US, regulators are looking at ways to improve radio receivers' rejection of RFI. Sel Embee KB3TZD brings us up to date.

SEL: The US Federal Communications Commission is asking for public input on ways to achieve RF interference immunity in receivers of radio signals. In a notice of inquiry adopted this month, the FCC has committed itself to explore options for improvement in this area. The commissioners are seeking comment on such things as recent technical advancements in the design of receivers; better ways to assess and rate receiver performance parameters; and insights into industry standards for these measurements that may have been created by the IEEE (I Triple E), ANSI, 3GPP and other standardization organizations.

Until now most FCC spectrum management efforts have concentrated on regulations governing transmitter performance. The FCC said in a press release that its goal is [quote] "to lay the foundation for future actions that could help create a more transparent and predictable radio frequency environment for all spectrum users." [endquote] The commission has expressed its concern most recently as new wireless services are added around the United States, making it all the more critical that service receivers already in place are capable of rejecting signals from outside their intended frequency band. One such ongoing case involves the Federal Aviation Administration's attempts to prevent 5G wireless transmitter towers from interfering with airplane navigation systems.

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FCC CRACKS DOWN ON 'HAZARDOUS' DRONE TRANSMITTERS

DON/ANCHOR: In other actions by the same agency, commissioners are cracking down on what they say are drone transmitters that pose a hazard. Kent Peterson KCØDGY picks up the story from here.

KENT: The US Federal Communications Commission is claiming that public safety could be imperiled by the operation of unauthorized drone transmitters and is seeking more than $3-million in combined fines from the devices' distributor. The agency's complaint, filed in US District Court in Portland, Oregon, charges that at least 65 models of the transmitter were never FCC certified. Certification would have ensured its RF signals did not interfere with the Federal Aviation Administration's aeronautical radar systems or any government transmissions. The FCC's civil complaint against the distributor, Hobby King, states that at least 15 of the transmitters [quote] "created a threat to public safety." [endquote]

The FCC also said that the devices do not serve a legitimate amateur radio purpose.

According to a report posted on the Oregon Live website, Hobby King has told the FCC that it believed no marketing rules exist specifically for this kind of equipment, which is capable of transmitting on amateur and non-amateur frequencies. The FCC countered, however, that its rules forbid radio frequency devices to be sold without first being labeled and authorized, consistent with its rules.

The agency is asking for $2.8-million from Hobby King for its violations. It is also seeking an additional $39,278 plus interest for Hobby King's failure to respond to earlier orders. Hobby King has stated that a required response from the company would have violated its Fifth Amendment right against self-incrimination.

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US GOVERNMENT TO STUDY PROPAGATION USING SATELLITE-BASED SENSORS

DON/ANCHOR: In the United States, officials hope to study HF propagation using satellite-based sensors. Andy Morrison K9AWM brings us that story.

ANDY: A division of the United States Department of Defense is hoping to gain a greater understanding of how HF waves propagate by taking those detailed measurements from inside the ionosphere itself. This takes information-gathering into a new realm because these studies typically rely on data gathered done from systems on the ground.

The US Defense Advanced Research Projects Agency is looking to take the measurements using sensors onboard very low earth orbit satellites. The agency project, named Ouija (Wee-Jah) is designed to get a better model of the ionosphere to address the challenges of electromagnetic noise facing HF radio transmissions of warfighters. The satellites are about 200 to 300 kilometres -- or 125 to 185 miles -- above the Earth. According to an article on the Industrial Equipment News website, the satellite payload will do direct sampling to measure electron density but will also conduct indirect measurements using radio occultation.

Jeff Rogers, the program's manager in DARPA's Strategic Technology Office, was quoted on the website, saying that Ouija's work inside the ionosphere would supplement measurements that would still be taken from the ground. He said the goal was [quote] "to develop and validate accurate, near real-time HF propagation predictions." [endquote]

ARRL, RSGB MAKING CHANGES AT HELM OF NEWS MEDIA

DON/ANCHOR: A veteran journalist and public information specialist has joined the American Radio Relay League as its news editor. John E. Ross, KD8IDJ, will be responsible for the league website's news content, the weekly ARRL Letter and two columns in QST magazine: "Happenings" and "Amateur Radio World." John will also be the voice of the ARRL Audio News which is produced weekly. John fills the vacancy left by the retirement of Rick Lindquist, WW1ME. John has served the league's Ohio Section for the past decade as its public information coordinator.

Meanwhile in the UK, the search is on for a replacement to fill the vacancy this summer when RadCom magazine editor Elaine Richards G4LFM, retires. The monthly magazine is published by the Radio Society of Great Britain. Additional responsibilities include putting together the weekly GB2RS news and overseeing production of the RadCom Basics and RadCom Plus specialist online only publications. Candidates should have experience in both print and digital formats. Applicants can apply on the Redwood website which is rewoodrecruitment - that's one word - dot com. The Society is also seeking a technical editor, following the recent death of Giles Read, G1MFG. For details visit the society website at rsgb dot org stroke careers (rsgb.org/careers).

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HAM RADIO WORKSHOP FROM HURRICANE CONFERENCE NOW ON YOUTUBE

DON/ANCHOR: As hurricane season gets going in some parts of the United States, hams who could not attend a virtual preparedness workshop will still be able to view the proceedings. Randy Sly W4XJ brings us up to date.

RANDY: If you weren't able to log on to the recent Virtual Amateur Radio Workshop at the National Hurricane Conference in Orlando, Florida, you can still have the experience of being there. The 4-hour, 33-minute workshop can be viewed on YouTube along with a schedule of various presentations that were hosted by Rob Macedo, KD1CY, director of operations for the VoIP Hurricane Net. Topics that were covered included the Hurricane Watch Net, the VOIP Hurricane Net, the Canadian Hurricane Center, and the importance of surface reports. There was also a presentation on the

Salvation Army Team Emergency Radio Network known by the acronym SATERN and a discussion of SKYWARN and CANWARN programs.

Rob says in his introduction to the workshop that the 2021 hurricane season in the United States was formidable and that 2022 promises to be at least as challenging.

HAMS PREP FOR ARMED FORCES DAY CROSS-BAND EXERCISE

DON/ANCHOR: May is a busy month in the United States on the amateur radio calendar. There's Hamvention opening on the 20th of May - and just a week before, on May 14th, there's the Armed Forces Day Cross-Band exercise. Jack Parker W8ISH has the details.

JACK: Ham radio and government radio operators will be sharing messages and testing their operating efficiency starting at 1300 UTC on May 14th in an exercise hosted by the US Army Military Auxiliary Radio System, or MARS. They'll be taking part in the Armed Forces Day Cross-Band exercise, an interoperability event with a history that goes back more than 50 years. Hams will be listening for stations on US military frequencies and transmitting on nearby amateur frequencies. Participating hams will be able to confirm their contacts with a QSL card. Hams copying messages from US Army and US Navy stations can request a QSL card online using the form at the website that appears in the text version of this week's newscast at arnewsline.org

Hams seeking a QSL card from US Air Force stations whose messages they have copied should send a request by mail to the Armed Forces Day Celebration, Chief, Air Force MARS, 203 West Losey Street, Scott Air Force Base, Illinois 62225.

According to the Department of Defense website, the numerous military stations transmitting messages will include Travis Air Force Base in California, the Newport Naval Radio Station Museum in Newport, Rhode Island, the US Coast Guard Base in Alameda, California, the Pentagon in Washington DC and the Barrow Army Reserve Center in Kentucky.

Although Armed Forces Day is May 21st, the test is being run a week earlier to accommodate Hamvention.

For Amateur Radio Newsline I'm Jack Parker W8ISH.

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MAINE AMATEURS RECEIVE TRAINING TO ASSIST DISASTER RESPONDERS

DON/ANCHOR: A group of amateurs in the state of Maine feels a little more ready for the next big emergency to come along. They've just completed some important training. Kevin Trotman N5PRE tells us more.

KEVIN: Members of the Aroostook [pronounced: uh-ROO-stick] County Amateur Radio Emergency Services just got another tool to add to their amateur radio kit: Training to function as CERT, the acronym for Citizen Emergency Response Team.

Brian Goff, KC1NHJ, the community outreach planner for the county's emergency management agency, told WAGM-TV that the CERT members provide support to search and rescue personnel as well as those administering first aid. He said even if the hams are not directly involved in providing the actual hands-on assistance, their use of radios is invaluable in getting the word out especially if cell towers may not be working.

Their training took place on a Saturday in the middle of April. The CERT members' first big test will come in just a matter of weeks when they will test their new skills by participating in an emergency drill.

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FCC FILING SYSTEM SHUTS DOWN ON FIRST DAY OF NEW FEE

DON/ANCHOR: On the day the FCC's new ham radio license application fees took effect, a system outage halted the agency's electronic batch filing system and files could not be processed. The ARRL Volunteer Examiner Coordinator sent out a notice to league members making them aware of the shutdown that occurred on Tuesday, April 19th. The FCC had asked that no further files be submitted for exam sessions or license applications until the issue could be resolved. The system was back on line, however, a few days later. The Volunteer Examiner Coordinator sent a notice to league members on Saturday, April 23rd saying that processing was restored and business could proceed as usual. The FCC was expected to begin reducing the backlog even as new files arrived. The FCC has previously said that the new $35 charge was necessary to cover staff costs associated with the application process, even though the review system is largely automated.

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INDIAN ENGINEERING SCHOOL HOSTS 2-DAY INTRO TO AMATEUR RADIO

DON/ANCHOR: One of India's pre-eminent engineering universities was the scene of a workshop on amateur radio basics. Graham Kemp VK4BB gives us that report.

GRAHAM: More than three dozen engineering and science students and their instructors were introduced to amateur radio and all its elements during a workshop held April 5th and 6th in Gujarat, India. Rajesh Vagadia VU2EXP, regional coordinator of AMSAT-India, gave the presentation at PDEU, one of the Indian state's top engineering schools.

In addition to gaining familiarity with various types of amateur radio equipment and the modes of communication, the students watched practical demonstrations, including Slow Scan TV, PSK-31 and Morse Code and learned to operate an HT. They also heard the stories behind many of the QSL cards on display throughout the two-day programme. Some careful planning ahead allowed the students to experience amateur radio contacts using the AO-91 Cubesat and had prearranged QSOs with Lucky, VU2LBW, and Kaustav VU2UUU.

Rajesh wrote that both four-hour days had a packed schedule and he hoped the students had gained insights into amateur radio's popularity and possibilities.

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NOMINATE NEXT 'YOUNG HAM OF THE YEAR'

DON/ANCHOR: We'd like to remind our listeners that it's time to think about the next generation of radio operators and appreciate their skill and dedication. Perhaps one of them will be the next recipient of the Amateur Radio Newsline Bill Pasternak Memorial Young Ham of the Year Award. Consider nominating an amateur radio operator 18 years of age or younger in the continental United States with talent, promise and a commitment to the spirit of ham radio. Find application forms on our website arnewsline.org under the "AWARDS" tab. Nominations close May 31st -- and that's coming up soon.

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WORLD OF DX

In the World of DX, be listening for Michael, DF8AN, operating as FM/DF8AN and TO8N in Martinique, J97MN from Dominica and a yet to be issued call on St Lucia. He is on the air until May 1st on the HF bands using mainly CW and digital. QSL using his home call.

Between May 9th and 14th, listen for Ilya EX/R5AF and Igor EX/R4FCN in Kyrgyzstan (KEER GUH STAN) on 40 through 10m. They will be using CW, FT8 and possibly some SSB. QSL via LoTW, Club Log, eQSL, HAMLog.

Yuris VU3FZC, Deepak VU2CDP and Monoj VU2CPL will operate from the Andaman islands as VU4W between May 3rd and 16th. Listen on the HF bands. For the official VU4W website reference refer to the text version of this broadcast at arnewsline.org. [PRINT ONLY: DO NOT READ: https://www.lral.lv/vu4w/]

John, W2GD, will operate from Aruba between May 24th and 31st from the P40W QTH. He will be using the call P44W. Be listening for him using CW on all HF bands as time permits. He will place special emphasis on the WARC bands. QSL via LoTW and N2MM.

(DX-WORLD.NET)

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KICKER: TURNING 'CHILDREN'S DAY' INTO 'RADIO DAY'

DON/ANCHOR: We end this week with a story that answers a common question these days: How do you get youngsters involved in radio? The answer is simple enough: You get them on the air for some serious DXing. Here's Jim Meachen ZL2BHF to tell us how it's being done.

JIM: Some people wait a lifetime for that special DX contact. But that waiting period isn't part of the equation for youngsters in Japan. Students in elementary, junior high and high school classes are at the top of the list for contacts when the Japanese Antarctic Research Expedition station 8J1RL calls QRZ for Children's Day, a national holiday in Japan. The contacts will take place for several hours on May 5th using 21 MHz SSB. This is the 63rd Japanese Antarctic Research Expedition but for many of the youngsters who'll soon be in the radio operators' log, it is going to be a very big first.

The students in Japan will join the ranks of those who have gone before them at schools in Alberta, Canada; Israel and the United States who, instead of talking to

the South Pole, have briefly mingled their voices with those in space, through Amateur Radio on the International Space Station. Whether young people talk to research scientists down below, or astronauts and cosmonauts up above, the spirit of adventure so dear to youngsters' hearts becomes even more accessible through the gateway of amateur radio.

In that respect, the Japanese holiday of Children's Day, which promotes the health and happiness of young people, is celebrated anywhere in the world whenever a youngster discovers the magic of radio.

Hackaday: Multiband Crystal Set

Dan Maloney KC1DJT writes on Hackaday about a multiband crystal set

Most crystal radio receivers have a decidedly 'field expedient' look to them. Fashioned as they often are from a few turns of wire around an oatmeal container and a safety pin scratching the surface of a razor blade, the whole assembly often does a great impersonation of a pile of trash whose appearance gives little hope of actually working. And yet work they do, usually, pulling radio signals out of thin air as if by magic.

Not all crystal sets take this slapdash approach, of course, and some, like this homebrew multiband crystal receiver, aim for a feature set and fit and finish that goes way beyond the norm.

The "Husky" crystal set, as it's called by its creator [alvenh], looks like it fell through a time warp right from the 1920s. The electronics are based on the Australian "Mystery Set" circuit, with modifications to make the receiver tunable over multiple bands.

Read the full Hackaday post at

https://hackaday.com/2022/04/28/multiband-crystal-radio-set-pulls-out-all-the-stops/

Dogecoin sent via HF and Starlink

A DOGE crypto currency transaction has reportedly been sent via HF radio using a protocol called Radio Doge

In 2019 radio amateurs in Canada and the USA made the first HF cross-border Bitcoin transfer using transmission in the 7 MHz band.

Techstory reports HF radio was used for part of the Dogecoin transfer but no frequency is given.

The report on the Techstory site says:

This technology is named RadioDodge which is a low cost and reliable technology. It works with Starlink internet service. This offline transaction was transmitted over HF radio to a regional hub more than 150 miles away in Colorado, USA.

The process went in such a way that dodgecoin transactions from the regional hub were routed to the dodgecoin testnet using the Starlink satellite. Dodgecoin supporters also expressed enthusiasm about this on social media. One user wrote, "First Dogecoin transaction without internet, using Radio Dodge. Dodge will reach people who do not have internet access through Radio Dodge."

Read the full story at

https://techstory.in/doge-transaction-sent-via-radio-using-a-protocol-called-radio-doge/

The New England QSO Party is coming in one week -

Hope you will have a few hours to operate in this year's New England QSO Party on May 7th and 8th, either from your home station or mobile.

We're trying to make sure Essex County is active on the air so please let us know if you plan to be on for even a short time by sending a note to us at info@neqp.org

The New England QSO Party is 20 hours long overall, in two sections with a civilized break for sleep on Saturday night. It runs from 4 pm Saturday until 1 am Sunday, then 9 am Sunday until 8 pm Sunday. Operate on CW, SSB and/or digital modes on 80-40-20-15-10 meters. For each QSO you'll give your callsign, a signal report and your county/state. Top scorers can earn a plaque and everyone who sends in a log with at least 25 valid QSOs will get a certificate. The goal is to work stations anywhere in the world - and their goal is to work New England stations, so you'll be very popular!

Full rules and other info --> http://www.neqp.org

Many thanks!! Hope you'll join in the fun.

-- Tom/K1KI

Some Ground Considerations for Vertical Antennas Used for Frequency Bands at or Below 10 MHz

Submitted by Paul Krueger -N1JDH

As I operate from a small suburban lot in Gloucester, large antennas at heights above 10 meters are not viable for me, except for verticals. In designing, building and testing some antennas I became very interested in the effects of ground strata on the performance of vertical antennas. This interest was piqued by finding that simulations of antennas were not as accurate as I had expected. I found that the ground strata here on Cape Ann is quite varied, especially with regard to depth of water tables. By locating a radial ground system above a high-water table, one can improve the performance of vertical antennas.

Any serious study of antennas and ground systems requires the use of electromagnetic software. The best full wave solvers use one of the following solution methods: Integral Equations (IE) solved by Method of Moments (MoM), Finite Elements (FE), Finite Differences in the Time Domain (FDTD), and Finite Integration Technique (FIT).

Models should simulate the electromagnetic response of antennas and scatters consisting of wires and conducting surfaces. Simulation tools should be capable of generating a number of wire and surface shapes that can be combined into complex models. Excitation can be voltage or current sources or incident plane waves. Models should be able to take into account elements that are above or buried in a homogeneous ground and take into account impedance loads, networks, and transmission lines. Outputs should include model currents, radiation patterns and near E and H fields. Many researchers consider the Altair FEKO electromagnetic simulation software to be the industry benchmark. There are other alternatives, one of the best one being the Lawrence Livermore Numerical Electromagnetic Code version 5.0 (NEC v5.0). The NEC v5.0 was designed to be embedded in other software tools, but has its own defined visual interface. Another excellent antenna simulation program is AN-SOF. I use both the FEKO and AN-SOF programs.

The effect of radials and other buried ground systems is often not well understood. A vertical monopole antenna is affected by the ground by two distinct and somewhat independent parameters. First the current flowing into the base of the antenna is balanced by an equal current flowing from the ground across the antenna's feed point. This current flows through the ground and incurs loss in the process. The primary purpose of a buried ground system is to reduce this loss by increasing the conductivity of the ground near the antenna. This is accomplished through capacitive coupling.[1] A poor ground system reduces antenna efficiency. Poor grounds reduce the strength of the radiated field, but has no effect on the antenna pattern.

The second effect is often of even more importance. The elevation pattern of any antenna is created by two correlated parameters. First a field travelling directly from the antenna to a point in space above the horizon. Second the field reaching the same point after being reflected from the ground. The relative strength and phase of these two fields create the maxima and minima of the vertical pattern. Vertically polarized waves are affected differently by the ground reflection than horizontally polarized waves. While horizontally polarized waves reflect nearly perfectly from even relatively poor ground (except at high

[1] The greater the capacitive coupling the better the ground system. Thus, increasing the amount of conductive material in the buried ground system, increases the capacitive coupling.

angles), vertically polarized waves do not, and are affected most when reflecting at a low angle. The net effect is that the pattern of a vertically polarized antenna is profoundly modified by the ground reflection.

With real ground, there is very significant loss of the low angle field, as compared to a perfect conducting ground. It should be understood that ground strata below radial fields have a significant impact at lower frequencies (below 10 MHz). Table 2 shows the depth of penetration of waves into the ground for three ground conditions. The first column is representative of seawater, the second of good ground, the third of poor ground.

Frequency	**Conductivity/Permittivity** 4 (mho/meter) /80	**Conductivity/Permittivity** 0.01 (mho/meter) /10	**Conductivity/Permittivity** 0.001 (mho/meter) /5
10 kHz	2.5	50	150
100 kHz	0.8	15	50
3 MHz	0.14	5	17
10 MHz	0.08	2	9

Table 1, Depth of Penetration (in meters) of Waves into the Ground[2]

Many antenna simulations assume a homogenous ground, but that is rare in the physical world. The best modelling programs use exact Sommerfeld integrals in a homogeneous half space region. The limitations of this approach were seen firsthand by the author in the design and construction of a vertical monopole in the year 2020.

A vertical monopole was designed and constructed for use on the 60-meter band. The antenna consisted of a 2-wire cage of 14-gauge insulated wire 14.7 meters in height supported by a non-conducting wooden and fiberglass pole. The ground system consisted of dual 2.5-meter ground rods separated by 1-meter at its base, with 32 (9.2-meter) radials buried at 5 cm below the surface. The physical antenna exhibited a lower resonance frequency, a higher resistance, and a lower reactance than what was predicted by the design simulations.

An earlier inspection of the physical site indicated average ground with conductivity of 0.005 mho/m and a relative permittivity of 13. The discrepancy between the simulated antenna impedance and the actual measured impedance could be explained by an incorrect ground conductivity and permittivity. A follow up inspection and review of land records indicated that although the conductivity and relative permittivity was correct down to about 1 meter, the water table at this site was about 1 meter below the surface.

The elevated water table was modeled as a disc of thickness 0.1 M with a radius of 5 meters around the center of mass of the ground rods, with a relative permittivity of 30 and a conductivity of 0.005.[3] When the simulation was rerun with inclusion of the water table permittivity and conductivity, the results from the simulation more closely matched the actual measured results. Conclusion: ground strata matter.

[2] Reference Date for Radio Engineers, Howerd W. Sams & Co, New York, sixth edition, 1981.
[3] Values for highly moist ground conditions.

Much research has been recorded at HF frequencies that indicates a radial field of 32 radials works quite well with less than 1 dB increase in performance by increasing the number of radials or their length. This is confirmed by experiments conducted by Rudy Severns. His results are presented in table 2 and Figure 2 below.

Number of Radials	*Corrected Signal Strength*	*Relative Signal Strength*
4	–30.1 dBm	0.0 dBm
8	–29.3 dBm	0.8 dBm
16	–28.9 dBm	1.2 dBm
32	–28.0 dBm	2.1 dBm
64	–27.7 dBm	2.4 dBm

Table 2. Test Data for Received Signal Strength with Po = 50 W (130 feet of 12 gauge insulated wire on the surface of the ground, with two galvanized 4-foot ground stakes at the center of the radial field) 160 Meter Band[4]

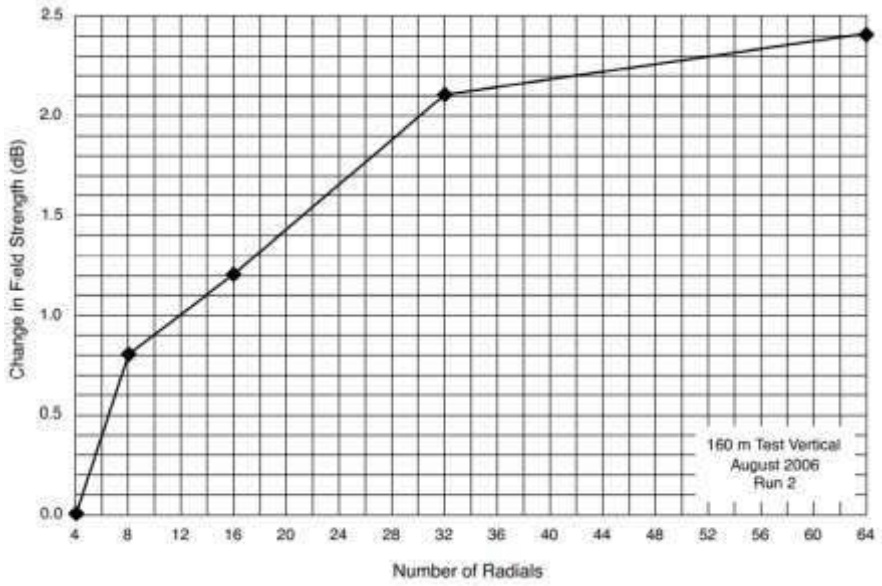

Figure 2 Graph of the typical signal strength change with radial number[9]

One can draw a few conclusions from my results and the work by Severns. As one moves from the 30 to 160-meter bands the existence of a water table below a radial field will improve the performance of a vertical antenna. The higher the water table the better, even a water table 5 meters below the ground surface can help the performance of shortened vertical antennas operating in the 80 and 160-meter bands.

Even if you have limited space for a radial field, it may be possible to build a shortened vertical antenna with a less than ¼ wavelength radial field that performs well on the lower frequency bands. If you can install 32 short ground radials, and the radial field is above a high-water table the antenna may perform

[4] Rudy Severns, " Experimental Determination of Ground System Performance for HF Verticals, Part 5 160 Meter Vertical Ground System," QEX, July/August 2009

adequately. I have had decent success in operating on the 80-meter band using a 14.7-meter vertical with a 9.2-meter radial field, over a high-water table. This antenna uses a remote antenna tuner at its base to minimize VSWR losses across the transmission line back to the transceiver.

I am currently experimenting with a new shortened vertical antenna 9 meters in height, with a coil at the top, and four horizontal wires for a capacitance hat. This antenna also uses the existing 9.2-meter radial field. I have been able to make quite a few contacts into Europe using FT8 on 160 meters using this antenna. I think that the water table is also helping out here as well.