



The *ORC* Newsletter



Official publication of the Ozaukee Radio Club, Inc. Email all contributions to the editor, Bill Shadid, W9MXQ (newsletter@ozaukeeradioclub.org). Permission to reprint articles published in any issue is granted provided the Author (as shown in the article) and the Ozaukee Radio Club Newsletter are fully credited in any publication.

ORC Repeaters on 146.97 (-127.3PL), 224.18 (-127.3PL), 443.75 MHz (+127.3PL) - Callsign W9CQO
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Volume XLI

April 2023

Number 4

From the President

de: Bill Greaves, K9GN



We are fortunate to have Tom KC9ONY Trethewey as our Repeater Vice President. Tom devotes considerable time to amateur radio through the Ozaukee Radio Club, as well as activities in other clubs. Those of you who voted for ORC Club Awards last month may have noticed Tom received the Ham of the Year Award in recent years for significant contributions to ORC success, as well as the Turkey of the Year Award for promoting friendship and good will. Many of you know Tom as the Net Control Operator of the Tuesday evening 8:00 pm net. Tom has also been the ORC Spring Swapfest Chair for several years. Both activities provide a major presence for the Ozaukee Radio Club, and we have Tom to thank. Thank you, Tom!

Tom is also temporarily helping with the audiovisuals for the monthly in-person and zoom club meeting. This activity is seeking a volunteer to take over the duties – no experience necessary; training provided!

I have been paying particular attention to grounding issues in my station design. There are many good information sources as many of you are aware. The series of three articles by Ron Block NR2B, even though they are somewhat long-of-tooth, lay an excellent foundation for station grounding. Other authors frequently reference his work. I came across a new article by him in the March/April 2023 issue of QEX, online through ARRL, titled, "Single Point Ground Panel Location." This 3-page read may be useful to you. I found my station design could use some modifications based on the article.

The old saying about April showers and May flowers actually means: April is here, and Field Day is around the corner. Field Day is Saturday-Sunday, June 23-24, with setup Friday, June 22. ORC has had a strong showing for several years and is looking to continue again this year. Consider putting this weekend in your calendar and joining other members of the club for a day or more, half a day, or even just to observe and see what is happening. My first Field Day was 2021; I learned much, met many ORC members, made a few contacts, and enjoyed myself thoroughly.

This month's pic is fairly sedate. I considered a photo with a week or so of facial hair during a lull in shaving. Be thankful!

See you at the club meeting, both in-person and on Zoom™, April 12 at 7:30pm, with meet-n-greet at 7:00pm, at the Grafton Senior Center – or on Zoom.

73,
Bill K9GN



Jacquelyn Henderson©

A Message from the Editor

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de: Bill Shadid, W9MXQ, Newsletter Editor

Please note Club President, Bill Greaves, K9GN, on Page 1 for his monthly message.

This month starts, close to the front, with two new authors – at least during my tenure as Editor. Gregg Lengling, W9DHI, our Webmaster, goes into great details on the Digital Radio scene with good explanations of D-Star, DMR, and System Fusion. As a recent buy-in to Digital Radio on the FM bands, I found the article interesting and informative. Next, see finely done details of a restoration project for an RF Probe and three AC Vacuum Tube Voltmeters by Chuck Curran, W9KR. Chuck has well known capabilities but what impresses me most is his flare for cabinetry restoration. Take a look at these two fine articles, beginning on page 6.

Tom Trethewey, KC9ONY, our Repeater Vice President, brings us further up to date on the ORC Spring Swapfest. And, for your reference, the very last page of the Newsletter is a copy of the Swapfest Flyer.

I am especially pleased to present a guest article this month from a friend of a couple of us in the ORC ranks, Dr. Lazlo Phynortné, PhD, and his work with the prestigious Rubicon Institute of Technology, in the study of “One Way Radio Propagation.” Please return thoughts to me for submission to Dr. Phynortné.

Check out our regular Contributors, Stan Kaplan with Computer Corner Article 301 talking about “Linux: the Book.” Don Zank, AA9WP, has an article on, “What was old is new again! Included in his article is a three-page excerpt from the June 1991, OZARES Newsletter. It was written by none other than our own Stan Kaplan, WB9RQR, who then was Ozaukee Country ARRL ARES RACES Emergency Coordinator – and editor of Newsletter. (Stan is also a former Editor of this Newsletter.) The reprint follow Don’s article.

Gary Sutcliffe, W9XT, in his regular On the Air Activities! As always, Gary shows the many radio things to do this month. Your Editor, Bill Shadid, W9MXQ, wearing his columnist hat brings Part 2 of the article on the Hammarlund HQ-215 Receiver. That article includes contributions by two fellow collectors of this 1969 vintage radio.

Ken Boston, W9GA, brings you the minutes of the March meeting minutes.

Want to know about future meeting programs? Pat Volkmann, W9JI, has you covered.

Need help to get your thoughts on paper for an article? That is what the Editor does!! Let me know how I can help you. newsletter@ozaukeeradioclub.org

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The ORC Spring Swapfest 2023 is next month!

de: Tom Trethewey, KC9ONY
Chairman, Spring Swapfest 2023
swapfest@ozaukeeradioclub.org

The Ozaukee Radio Club's 43rd Annual Spring Swapfest is coming next month. Saturday, May 6, 2023, from 8 AM to 12 PM, on the Ozaukee County Fairgrounds in the Ascension St. Mary's Expo Center, in Cedarburg, WI. We've been there for several years now.

I'm hoping to eventually make it one of the biggest or best in the area. Of course, to do that, I need your help. Please consider volunteering to help with setup and tear down, putting up and taking down exterior signage, and other duties as assigned. It's not really hard, but it does take members to make it successful. Even if you are one that normally doesn't go to Swapfests due to not needing to buy anything, I'd encourage you to at least help the club by volunteering your time that weekend.

Still working on sponsors for door prizes, but I hope to get that finalized soon. Once again, Tower Electronics will be there with 14 tables of items and antennas for you to purchase. I'm excited to have the Cub Scout Pack 586 returning again, too. Awaiting the list of possible food and refreshments, but you'll remember they had a great selection last year. Please support them as well.

Can't make the Swapfest for whatever reason? How about purchasing an advance ticket? I'll throw it in the prize drum for you, as you'd still be eligible for the grand prize as you do not have to be present. Or please consider a small donation to help support this great club.

I will be at the ORC April 2023 meeting where you will be able to buy advance tickets, which are double-stub for the door prices, and order tables if selling. I will also be at the Madison Hamfest on Saturday, April 15, 2023, passing out flyers, selling tickets and table orders there as well.

You can print out the Spring Swapfest flyer from our website:

<https://www.ozaukeeradioclub.org/downloads/spring-swapfest/2023-ORCSpring.pdf>

Or check the last page of this Newsletter for a Spring Swapfest Flyer copy,

So far, no one has answered my question about why some are called hamfests and some are called Swapfests. Any idea?

Welcome to the Digital Revolution

de: Gregg Lengling, W9DHI



Amateur Radio has always been on the leading edge if not the developing edge of technology and in this digital world this still holds true. VHF and UHF repeaters and communications have gone from AM to Sideband to FM and now to Digital. However, in Digital there are competing versions of technology and they are not compatible with each other, yet they have their own pluses and minuses.

In this article I'd like to only talk about the modes that are supported by Amateur Radio Manufacturers. There are other modes that many hams have embraced but they are relegated to using only converted commercial (public safety or business equipment) and we won't be covering those. Here I'd like to concentrate on 3 modes, D-STAR, DMR and System Fusion. In the table below I've outlined the methods involved in each. The only proprietary item (to which the manufacturers pay royalties) is the AMBE+2 Encoder. The actual operating standards are open and available to any manufacturer who wishes to use them.

	Protocol		
	D-Star	DMR	System Fusion
Vocoder	AMBE+	AMBE+2	AMBE+2
FEC	Voice Only	Voice Only	Voice Only
Modulation	GMSK	4FSK	C4FM
Multiplex Method	FDMA	TDMA	FDMA
Transmission Rate	4.8 kbps	4.8 kbps x 2	9.6 kbps
Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz
Channels	1	2	1
Developer	JARL	ETSI	Yaesu
Original Use	Amateur Only	Business	Amateur Only
Current Manufacturers	Icom Kenwood *	Multiple (All Commercial)	Yaesu

All 3 protocols are Open Standards

** = discontinued*

EASE OF PROGRAMMING AND SETUP TO USE

D-STAR has a small learning curve but is intuitive. D-STAR requires registration to use linking (otherwise linked parties won't hear you). (Newer XLX reflectors don't require registration.)

DMR is probably the steepest learning curve as it requires zones, groups, colors, timeslots and talk groups. (Hence the reason one ham dealer includes a subscription to their DMR University). DMR requires registration for a DMR ID without which you cannot use the radio.

System Fusion is the easiest to program. Programming your Callsign and repeaters just like FM and select FM or Digital Mode and you are on the air. System Fusion only requires registration if you wish to use internet connectivity on your station. (It does not preclude using linked repeaters or gateways.)

ID REQUIREMENTS

Your Callsign is embedded in each transmission on D-STAR and System Fusion so that meets FCC ID requirements. DMR does not, it embeds the DMR ID so you must still voice ID. Receiving calls in D-STAR and System Fusion you will see the transmitting parties Callsign on your Radio Display. On DMR the DMR ID is embedded so you will not see the calling parties Callsign but their DMR ID instead unless you have a radio that allows loading in contact list that will translate DMR ID to Callsign.

LINKING

D-STAR has several types of linking. Originally it was all repeaters had a Gateway (most do) and you would do Callsign routing by entering the call of the person you were looking for. The network would route you from the repeater you are on to the repeater that the other person was last heard on. You could also send a command to link the repeater you are on to another one on which you would like to make a call. Finally, a savvy ham came up with what is called D-Plus where Reflectors were created and provided rooms to link together and talk on (these are hosted in the cloud typically). Later alternate reflectors/rooms were also created. Today users typically link repeaters to Reflectors and enable wide area coverage. For example, in Wisconsin REF019B has many repeaters linked to it. And if you don't have access to a linked repeater Hot Spots were created using RPi's and MMDVM hats and many people use those as they work on any Wi-Fi connection (including in vehicle Wi-Fi).

DMR has repeaters all available on Networks such as BrandMeister and by entering a talk-group number on a repeater you can link to other areas to talk to others.

System Fusion has WIRES-X which originally required an HRI-200 linking controller which is still required if you are creating your own talk-group/room, however firmware in most (not all) of the Yaesu radios allow you to connect direct to a computer with a special cable and access the WIRES-X network. There are standalone networks accessed only through Hotspots, but the WIRES-X is more prevalent.

WHAT SHOULD YOU BUY?

Currently in Wisconsin these are the numbers of coordinated repeaters for each mode.

- D-STAR 27
- DMR 22
- System Fusion 34

These are those listed by WAR (Wisconsin Association of Repeaters), but WAR has been slow on co-ordinations and updates of their lists as there are pending co-ordinations going back 5 years. I've found many more D-STAR repeaters in Wisconsin that aren't in the list and found many DMR repeaters that no longer exist but are listed.

What should you buy? Well, that's a choice you have to make. Entry level DMR you can buy low cost Baofeng radios for under \$100. For System Fusion the Yaesu FT-70DR handheld is under \$200. For D-STAR the latest ID-52 Handheld is rather pricey. But there are used radios out there at the Swapfests. I purchased a used ID-51 at the Jefferson Swapfest last year for \$100.00. But also consider what repeaters you would like to use. Is there one near you?

DIGITAL REPEATERS IN OZAUKEE COUNTY

K9QLP/R 442.100 repeater output 447.100 repeater input. Running dual mode responds to System Fusion or normal FM with CTCSS 127.3. This repeater is not linked. (sited on a high point in City of Cedarburg)

W9DHI/R 444.975 repeater output, 449.975 repeater input. Running dual mode responds to System Fusion or Normal FM with CTCSS 127.3. This repeater is linked to the WIRES-X worldwide system, normally resides on SE-WIS-NET (room number 43302). Please announce if you are changing rooms and make sure you disconnect the room when done (not just the WIRES-X button on radio, you must send a room disconnect command) (sited on 120-foot tower on the highest point in Ozaukee County, Wide Area Coverage)

N9FRG/R 442.775 repeater output, 447.775 repeater input. Running dual mode responds to System Fusion or Normal FM with CTCSS 127.3. This repeater is linked to the WIRES-X worldwide system, normally resides on SE-WIS-NET (room number 43302). Please announce if you are changing rooms and make sure you disconnect the room when done (not just the WIRES-X button on radio, you must send a room disconnect command) (Sited at MATC north Microwave tower).

W9FRG B 442.81875 repeater output, 447.81875 repeater input. Running D-Star only with G3.1 gateway connectivity automatically on Ref019B during the day. Cedarburg (on W9DHI tower)

W9FRG C 145.225 repeater output, 144.625 repeater input. Running D-Star only with G3.1 gateway connectivity automatically on Ref019C during the day. Cedarburg (on W9DHI tower)

W9FRG A 1297.500 digital data D-Star with G3.1 gateway connectivity. Cedarburg (on W9DHI Tower)

DIGITAL REPEATERS IN WASHINGTON and NORTHERN WAUKESHA COUNTY

W9CQ/R 147.285 repeater output, 147.885 repeater input. Running dual mode responds to System Fusion or Normal FM with CTCSS 127.3. Repeater does not currently have WIRES-X connectivity. Located in Germantown.

W9RCG/R 442.01875 repeater output, 447.01875 repeater input. Running DMR CC9 Located in Menomonee Falls (I cannot confirm active)

W9RCG/R 442.03125 repeater output, 447.03125 repeater input. Running DMR CC9 Located in West Bend (I cannot confirm active)

DIGITAL REPEATERS IN MILWAUKEE COUNTY

W9EMP/R 443.41875 repeater output, 448.41875 repeater input DMR CC9, Hales Corners (I cannot confirm active)

KB9ZB/R 442.20625 repeater output, 447.20625 repeater input, DMR CC9 , Milwaukee

N9PAY/R 444.53125 repeater output, 449.53125 repeater input, DMR CC9, Milwaukee (I cannot confirm active)

KC9LKZ/C (soon to be W9MIL/C) 145.245 repeater output, 144.645 repeater input D-STAR Milwaukee, G2.0 Gateway enabled

KC9LKZ/B (soon to be W9MIL/B) 442.46875 repeater output, 447.46875 repeater input, D-STAR Milwaukee, G2.0 Gateway enabled (currently off air, awaiting install of new repeater)

KC9LKZ/A (soon to be W9MIL/A) 1290.050 repeater output, 1270.050 repeater input, D-STAR Milwaukee, G2.0 Gateway enabled.

W9RH/R 145.390 repeater output, 144.790 repeater input, Running dual mode responds to System Fusion or Normal FM with CTCSS 127.3. WIRES-X enabled

N9OJH/R 443.725 repeater output, 448.725 repeater input. Listed as dual mode running System Fusion and Normal FM with CTCSS 127.3 (I cannot confirm if active)

Glossary

D-STAR: Digital Smart Technologies for Amateur Radio. It is an open standard digital communication protocol established by JARL

DMR: Digital mobile radio is a specification for commercial products so they can interoperate. It is defined by a standard[1] created by the European Telecommunications Standards Institute (ETSI) and manufacturers found Amateur Radio was using it so they developed and type-accepted radios for Amateur use.

System Fusion: Yaesu's implementation of Digital Amateur Radio, utilizing C4FM 4-level FSK Technology to transmit digital voice and data over the Amateur radio bands.

AMBE+: DVSI's Implementation for a Vocoder.

VOCODER: A category of speech coding that analyzes and synthesizes the human voice signal for audio data compression, multiplexing, voice encryption or voice transformation.

GMSK: Gaussian Minimum Shift Keying, GMSK is a form of modulation based on frequency shift keying that has no phase discontinuities and provides efficient use of spectrum as well as enabling high efficiency radio power amplifiers

4FSK: 4 level Frequency Shift Keying

C4FM: Continuous Four Level Frequency Modulation, which is a special type of 4FSK, which is used in conjunction with FDMA - Frequency Division Multiple Access

FDMA: Frequency division multiple access

TDMA: Time-division multiple access

BrandMeister: An operating software for Master servers participating in a worldwide infrastructure network of amateur radio digital voice systems

WIRES-X: Wide-coverage Internet Repeater Enhancement System.

REF: D-STAR Reflector is a computer connected to the internet that runs special software. The wonderful thing about reflectors is that lots of repeaters can be connected to one reflector.

W9DHI

Restoration Project – RF Probe and Three AC Vacuum Tube Voltmeters de: Chuck Curran, W9KR



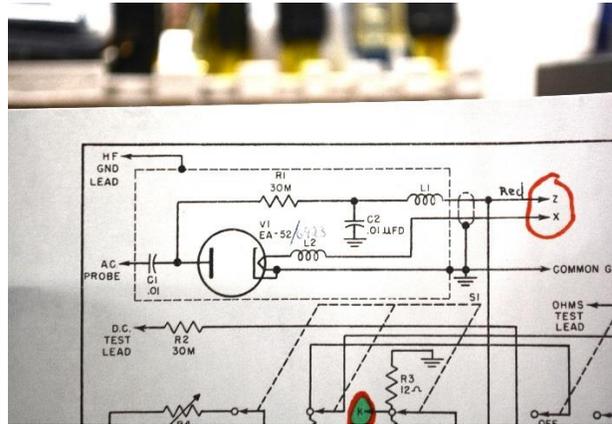
This article focuses on a way to provide a means of completing a vacuum tube transmitter alignment, specifically on a reasonable piece of test gear to help you peak the various trimmer capacitors or inductors found in many transmitters. In my write-up I will be mentioning four different pieces of gear that I have used and own today. They are the Fluke Model 85RF RF Probe, the Hickok Models 1600 & 1600B, and the Hewlett Packard 410C, the last three include an RF voltage measurement probe rated at 10 Hz to 700 MHz. Below is shown a picture of the Fluke probe:



The above probe and meter do a wonderful job, but there is a limitation that is found as soon as you start working on a vacuum tube transmitter. This probe is rated for a maximum RF signal of 30 VAC. A typical transmitter using 6146 tubes as the finals will see in excess of 70 VAC at the control grids of the 6146 tubes. So, you will pop the diode that is inside the probe and start looking for test gear with a probe made for a higher rating! It is NOT an Oscilloscope. Their input impedance is around 1 megohms, not high enough, while an RF VTVM has an input impedance for AC signals of 10 megohms. Here is a picture of the two pieces of Hickok gear:



The one on the left is the model 1600, while the one on the right is the 1600B. The cabinet design for the 1600 was really bad, they corrected their mistakes on the 1600B. Below is shown the probe style used on both of these units, this one came with the older 1600. It was designed in about 1958 and apparently sold starting in 1959. This probe for the Hickok 1600 arrived missing several key parts, and while I got the DC +/- volts and resistance to work, it took longer to verify that the AC function worked. I provided a DC signal into the AC circuit, (which the probe does), and it worked well so I was optimistic. AC probe is capable of measuring 10Hz to over 700 MHz. See probe picture and probe circuitry below:

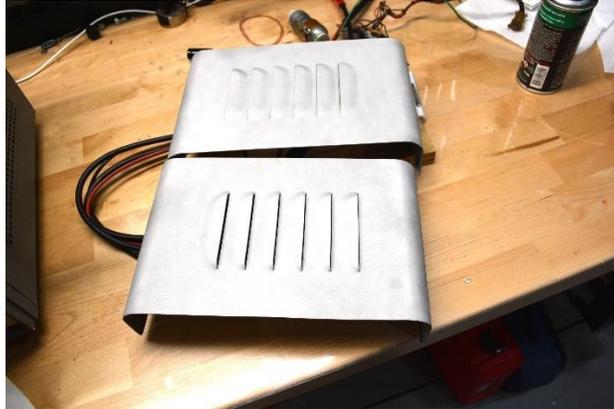


Only a few components were replaced in both the 1600 and 1600B Hickok meters, one selenium rectifier and three electrolytic capacitors. I left the old can type electrolytics disconnected in the chassis, just to allow it to look complete.



What's that red thing at the bottom of the picture? If you have ever built a Heathkit, you already know. It is one of their nut starters, to help speed up assembly.

Both units needed a new paint job and a new leather handle for the 1600B. Below are pictures of the repainting done on both units



Sand Blasted 1600 side panels.



1600 side panels repainted.

1600B cabinet was sanded and repainted, as shown below:



The RF AC probe wouldn't function on the Hickok 1600, due to missing parts. I was able to locate a new probe assembly for the 1600B, shown below. The functional probe that came with the 1600B is now connected to the Hickok model 1600.



Two working RF voltmeters aren't enough, so here is the third, a Hewlett Packard 410C. When bought it was a train wreck, now is working fine but still needs AC voltage to be calibrated.



This item was missing the bottom cover, the AC plug on the back was one that no cords can now be found to match the socket, and still used one vacuum tube, the rest all solid state.



The above circuit boards from the HP 410C were replaced with solid state items, made by Kiss-electronics of Cornelius, Oregon, they were a two-minute job to install.

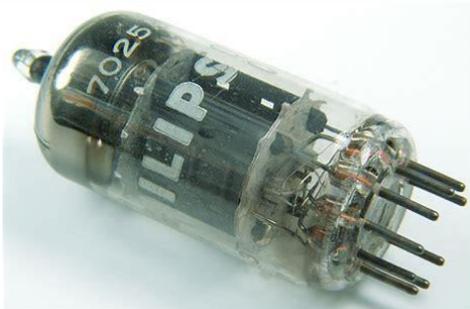
The Hickok 1600B is now ready to use, while the HP 410C has to have the calibration finished, and the Hickok 1600 has to have the sheet metal sides installed. Below is the Hickok 1600B with a rebuilt leather handle, made by Heim's Shoe Store in Grafton, WI.



Last photos of the Hickok 1600 RF VTVM all assembled and ready to go to work:



W9KR



Hollow State Technology

One Way Radio Propagation Finally Explained

by: Dr. Lazlo Phynortné, PhD

Reprinted with permission from the

Journal of Unexplained Natural Quantum Unusual Electrodynamics



If you are an amateur radio HF operator, you may have encountered times when you could hear a station very well, but they could not hear you, even though both stations are operating at similar output power levels. This phenomenon is called “one way propagation” or OWP. It was a controversial subject, with some amateurs not believing it actually occurs, with others claiming they have observed it.

However, with modern tools such as PSKReporter, WSPRnet, and other monitors, it is apparent that, at times, stations located in Region A will hear stations in Region B, but not in the reverse direction. It is not just individual stations being unable to communicate but involves many stations over broad areas.

Many theories have been created to explain this phenomenon, but empirical evidence has recently pointed to the actual cause. New research at the Rubicon Institute of Technology (RIT) has uncovered the probable cause of OWP. In effect, the ionosphere can, at times, create virtual ionospheric diode regions permitting signals to propagate in one direction but not the reverse direction.

Before explaining how OWP operates, it is necessary to understand how solid-state diodes work. Solid state diodes are made from a semiconductor material, usually silicon, although germanium can also be used. The semiconductor material exists in the form of a three-dimensional crystal lattice structure. Silicon atoms in a crystal share their outer valence shell electrons. There are no excess electrons not used in binding the silicon atoms together. Nor are there any potential bonds needing an unavailable valence shell electron.

To make a diode, transistor, or similar solid-state device, impurities are implanted into the crystal lattice structure. This process is known as “doping.” If an impurity of an element like phosphorus or arsenic is infused into the lattice, there will be extra negatively charged electrons not bonded to the surrounding silicon atoms. Those excess electrons can easily transport through the lattice. The semiconductor material doped in this manner with elements from this region of the Periodic Table is described as the N type of semiconductor.

Conversely, if the crystal matrix is doped with an element like gallium or boron, the outer valence shell does not have sufficient electrons to complete every bond with the surrounding silicon atoms. The missing bonds are known as holes. This material is P type semiconductor material.

A diode is a section of N type semiconductor next to P type material. When a voltage is applied in the forward bias direction, the extra electrons in the N section will flow across the PN junction and through the P material via the holes. However, when a reverse bias voltage is applied, the extra electrons in the N zone move away from the PN junction, as are the holes in the P material, and no current flows.

Radio propagation occurs when solar UV light excites electrons in oxygen or nitrogen atoms in the high fringes of the atmosphere. The extra energy allows the electrons to escape their valence shell orbits. This region is known as the ionosphere, and radio waves travelling through it are refracted back to earth. The free electrons in the ionosphere act like N material and the remaining positive ions missing an electron are similar to P material.

Solar photonic pressure can, under proper conditions, push the lighter electrons away, leaving the heavier positive atomic nuclei in place, creating ionic regions establishing a virtual ionospheric PN junction. As a result, electromagnetic waves traveling in the forward bias direction proceed undisturbed, while radio waves traveling in the reverse bias direction are stopped. This phenomenon is the cause of OWP, and the effects continue until the free electrons and ions are able to recombine.

While OWP is a nuisance for amateur radio operators, it can be very disruptive for military and commercial HF circuits. Researchers are working on methods to work around one way propagation. The most promising research involves anti-electromagnetic waves.

Anti-electromagnetic waves are roughly analogous to antimatter. Anti-electromagnetic waves can theoretically freely propagate through reverse biased PN regions of the ionosphere. However, actually generating them has proven difficult, and practical implementations have been challenging to produce.

None of the major amateur radio manufacturers have confirmed they are working on anti-electromagnetic wave transmitters, but there are rumors of an anti-radio being introduced at the 2024 or 2025 Hamvention®. At any rate, FCC Part 47 rules must be modified to permit amateurs to use them because anti-electromagnetic waves operate at anti-frequencies. There are no current amateur allocations for anti-frequencies.

The work done at RIT promises to open a whole new exciting chapter in radio communications. Your new radio may soon be obsolete.

© 2023



OZARES: Ozaukee Amateur Radio Emergency Services

de: Don Zank AA9WP, OZARES Emergency Coordinator, aa9wp@arrl.net

What was old is new again!



An OZARES practice net was held on March 16, as we normally do on the first two Thursdays of the month. But this time there was a little twist to the exercise.

Roland, KB9TMB, who was the net control station for the evening, and Dave, KD9JYL, devised a Simplex test for the group that consisted of two components.

The first component would have OZARES operators testing on the American Red Cross simplex frequency of 147.420 MHz. *Did you know there was an American Red cross simplex frequency?*

The second component would have available members operate from outside locations.

Roland and Markus, KD9UWG, set up two vhf stations at the bluff in Lake Park, Port Washington. A very nice location for operating to the south and across the lake.

Todd, KD9JYL, established a remote station just outside of Port Washington. I am located in Mequon outside of Mequon City Hall. Naomi, KC9YES, and Tony AD9BR, (and congrats to Tony on the license upgrade to an Extra) operated from home locations.

Roland kicked off the net with check-ins. He then called Dave who was located at the Red Cross Office in Milwaukee on Wisconsin Avenue.

Dave, Markus, Todd, and I all had good copy on Dave from the Milwaukee location. He would then travel north to Ozaukee county along the lakefront and eventually on I-43 in Bayside. The only point along his trip where communication became impossible was at the old pump house location, otherwise known as Colectivo Coffee on Lake Drive. That is a rather deep hole along the lake shore.

As Dave drove along north we continued the simplex testing on several vhf and uhf frequencies. The results obtained were interesting. Dependable communications between all the operators varied with the bands used. As would be expected. But not expected were the results occurred with Todd and Dave as Dave ventured further north. Todd, located farther to the west, had intermittent success as Dave moved closer to Port.

It was an excellent simplex test for the start of the warm weather season. We plan on more tests in the future. As always, everyone learned something different from the exercise.

The Wednesday before I was looking for information on the BBS system that had been used by OZARES and the ORC back in the 90s. You know, before cell phones. I was

going through newsletters, and I came across the article (reprinted on the next three pages), written by Stan Kaplan, WB9RQR. It is interesting reading and makes a good starting point for our further testing. Enjoy, and Thank You, Stan.

In the previous issues, I discussed the National Incident Management System, or NIMS, and its expectations for communication operators and systems. Recently a final version of the NIMS Information and Communications Technology (ICT) Functional Guidance was released by the Federal Emergency Management Agency (FEMA). The guidance is updated to include the support available from amateur radio operators. The Communications Unit (COMU) includes the Auxiliary Communicator or AUXC role. Amateur radio operators are included in the Auxiliary Communicators role. (How about those three-letter acronyms?)

It is available at:

https://www.fema.gov/sites/default/files/documents/fema_ict-functional-guidance.pdf

OZARES Repeaters . . .

- 147.330 MHz (+ Shift) (127.3 PL)
 - 443.525 MHz (+ Shift) (114.8 PL)
-

ORC Repeaters are On the Air – Awaiting Your Call . . .

- 146.97 MHz (- Shift) (127.3 PL)
 - 224.18 MHz (- Shift) (127.3 PL)
 - 443.75 MHz (+ Shift) (127.3 PL)
-

Reprint of Stan Kaplan's June 1991 OZARES article follows: (Look for people you recognize!!)

O Z A R E S N E W S L E T T E R
 Ozaukee County ARES/RACES
 Volume 2 Number 6 June 1991

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RESULTS OF THE ARES/RACES EXERCISE - 8Jun91

On Saturday morning, June 1st, I asked those OZARES members present at the regular ORC breakfast meeting if they could participate in an exercise the following week. Most said they could, and they knew it was coming, but the only other details announced was that it would end at noon or earlier, and that up to 9 cars were needed, each containing one or two hams with mobile rigs and HTs.

After breakfast the following week, I handed out assignments. Eight cars were available. Some contained one ham, some contained two. Each car was sent to a different site in Ozaukee, Washington or Milwaukee County. A net was called on the ORC 2 meter repeater as soon as all vehicles had arrived at their assigned positions. Pairs of vehicles were asked to move to a simplex frequency, and to establish contact with each other, mobile to mobile, and to rate the quality of communications on a preprinted form as EXCELLENT (100% copy, full quieting), GOOD (100% copy, weaker but solid), FAIR (85-90% copy, heavy frying noise), POOR (50% or less copy, noise covers communications) or NO CONTACT (cannot establish contact at all). When mobile to mobile contact was finished, each pair was to repeat the rating, using HT to HT contact if possible. Then the pairs of vehicles were to return to the net for reassignment. There were 8 vehicles making contacts and 28 possible combinations (site 1 with 1, 1 with 2, 1 with 3, and so on).

1

It turned out that very few decent HT to HT contacts were made, so lets forget about them. Solid mobile to mobile contacts were made in almost every case, which yielded two ratings for each contact. For example, if the car at site 4 was in contact with the car at site 8, both hams marked a rating for the contact on their sheets, giving two independent ratings for each contact. Often, the two ratings were identical, in which case just a single rating was marked on the enclosed map. If the ratings were not identical, both are shown. Thus, the letter F on the map means that both hams rated the contact as FAIR, while an E/G means one ham called it EXCELLENT and the other GOOD. In only a few cases were the ratings more than one notch from each other. For example, KA9DDN at site 1 in Port Washington rated his contact with KA9QLP and N8DYG at site 4 at Five Corners as NO CONTACT, while KA9QLP and N8DYG called it FAIR. Obviously, Skip could not hear the other guys, but they could hear him, a reasonable expectation in some situations.

Well, what did we learn? Look carefully at the map and you will see a numeral near each rating - that is the distance, in miles, for that particular rating. The results are summarized below, rearranged in order of distance. Note that there was no position 6, and not all possible combinations and permutations were tried:

POSITIONS	MILES	RATING
3 <—> 5	5	E/G
5 <—> 8	7	E
2 <—> 4	7	F/G
2 <—> 3	8	G
4 <—> 7	9	E/G
3 <—> 4	9	G
1 <—> 4	9	F/N
4 <—> 5	10	G
1 <—> 2	10	F
3 <—> 8	12	E/G
4 <—> 9	12	F
5 <—> 9	13	G
2 <—> 5	13	G
5 <—> 7	14	E
1 <—> 7	14	G/P
4 <—> 8	15	G/F
3 <—> 7	16	F/N
1 <—> 3	17	P/N
3 <—> 9	17	G
2 <—> 8	19	F

1

There is a tendency for contacts to be solid when the distance is about 10 miles or less, and for them to be less than solid when over 10 miles. Beyond that, the differences may be attributed to differences in terrain, to differences in rigs, and possibly to individual differences in the judgment calls concerning the quality of communications.

That tells us something of value! We can expect mostly solid communications up to 10 miles or so in the area tested, with the possible exception of Port Washington, unless the ham is located on a high point in that city.

Whats next? There is a large chunk of Ozaukee County we did not test - north of Port Washington. On the eastern side, Belgium and Harrington State Park; Fredonia and Waubeka lie to the west. Although they are out of Ozaukee County, Oostburg and Cedar Grove would also be of interest. There are large areas of uninhabited farm land between these sites. Wouldn't it be interesting to see if the change we saw at around 10 miles holds in more uninhabited areas?

Sometime after Field Day we will have another, similar exercise to the north of Port Washington. Its fun, takes only a couple of hours at the outside, and tells us something about our ability to communicate in our county and those surrounding it. This kind of data can be invaluable if we ever need to set up emergency communications. So, in a nutshell, thanks to those members who participated on the 8th of June (listed below), and keep your ears open for the announcement of the next date. Its good information, and good training!

PARTICIPANTS (Numbers are site assigned)

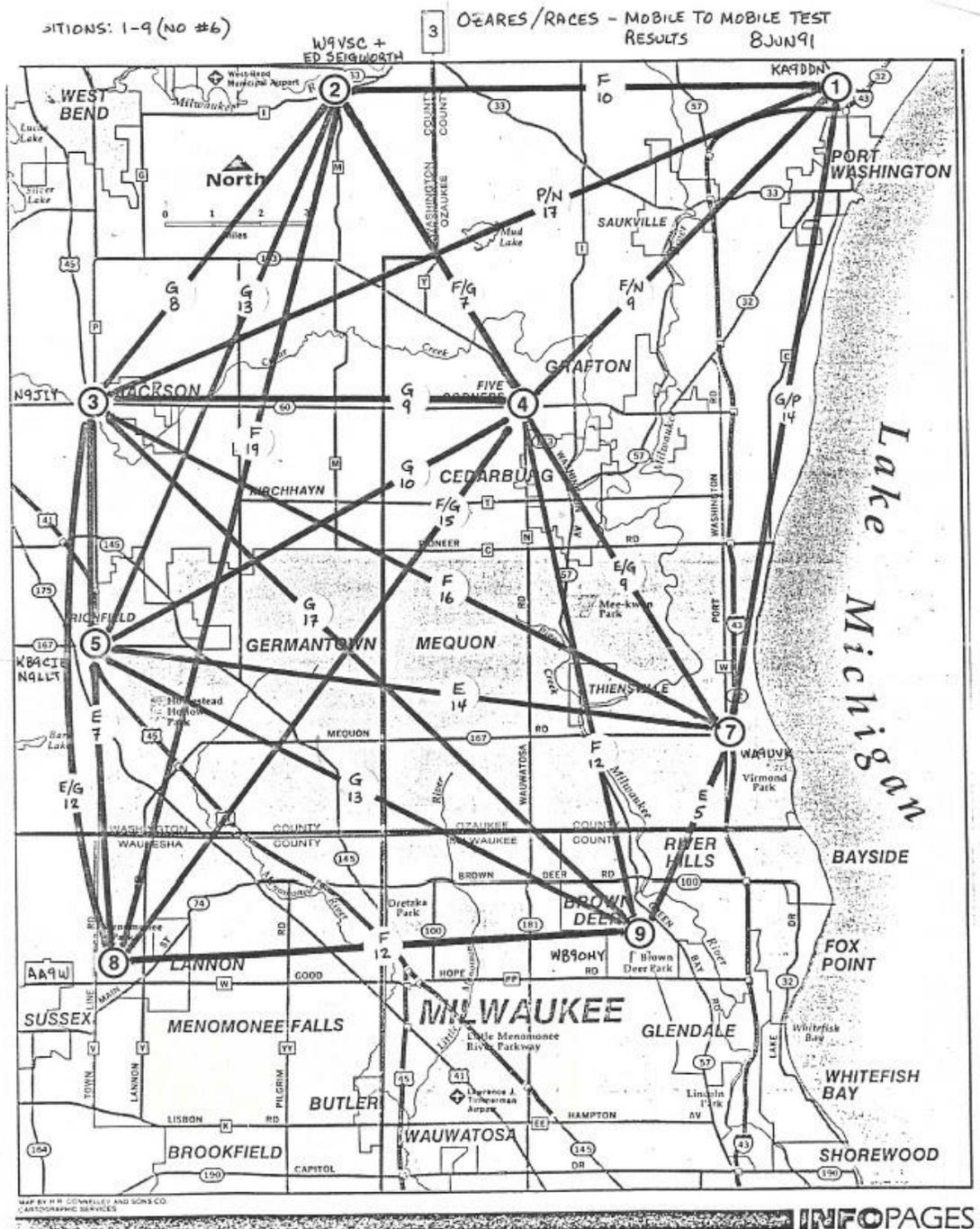
1	KA9DDN	Skip	5	N9LLT	Ted
2	W9VSC	Don	5	KB9CIE	Joe
2	NoCallYet	Ed	7	WA9UVK	Herb
3	N9JIY	Mike	8	AA9W	Ed
4	KA9QLP	Jim	9	WB9OHY	John
4	N8DYG	Thom	NET	WB9RQR	Stan

- 73, Stan

It was just what it was supposed to be - a fun weekend of operating under field conditions, with emergency power. No sprains, strains or other accidents, and all who participated had a good time. Most important from the ARES/RACES point of view, we took Ozaukee County Emergency Government's Drake TR-7 transceiver, power supply, mike and speaker out to the site, and it wound up in the cook tent at the main, 40 meter phone position. Hooked it up to a 40 meter CCD dipole with open wire feed. Could not get it to tune properly with the open wire tuner I built which Joe, W9WQ, had modified. However, after replacing that tuner with my personal Ultimate that has a balun in it for open wire feed, it worked perfectly. Bob Truscott, W9LO, helped me tune it properly, and the SWR was a flat 1:1 with a full 100 watts out. It performed admirably, with 687 contacts during the 24 hour operation, more contacts than any other position. We gave it a good cookout of moisture and shakedown test under field conditions. I also repaired the speaker wire, which had been spliced by twisting, but not soldered or taped! We can now rest assured that the unit works, should it ever be needed under real emergency conditions. We should probably do this yearly just from a maintenance point of view. Our thanks to Bill Stolte, Director of Ozaukee County Emergency Government, for permission to take it out for the shakedown test.

A SOURCE OF FREE MAPS

Have you gotten a new telephone book lately? What did you do with the old one? You say it went into the paper pile for recycling? Well, there are a few pages you should have saved. The first few pages of both the yellow and white versions of the phone book contain a series of several excellent local maps, and each includes a mile scale which you can use to calculate distances. Rip them out as a unit before discarding the rest of the phone book, and keep them with your ARES/RACES telephone tree and other materials. I have several extra Milwaukee series maps that I would love to trade for a Port Washington series and Cedarburg series (each community is slightly different in its coverage). Save a set for me!



KEY: E = EXCELLENT G = GOOD F = FAIR P = POOR N = NO CONTACT © Ameritech Publishing, Inc. 1989
 EACH RATING BY 2 HAMS. MOBILE RIGS FROM 5-50 W, 5/8 WAVE ANTENNA TYPICAL BUT NOT UNIFORM.

[Editor's Note:] This and the Previous Two Pages were Reprinted from the June 1991 OZARES Newsletter. Author: Stan Kaplan, WB9RQR, who was then Ozaukee County ARRL Emergency Coordinator as well as Editor of the OZARES Newsletter. Hats off to Stan and his long service to Ozaukee County, Wisconsin, Ozaukee Radio Club, and Amateur Radio. (Stan is also a former Editor of this Newsletter.)

THE COMPUTER CORNER

No. 301: LINUX: THE BEST BOOK

de: Stan Kaplan, WB9RQR, 715 N. Dries Street, Saukville, WI 53080-1664

wb9rqr@gmail.com

There are lots of books and pamphlets on Linux Mint out there, but here is one that is probably the best bang for your buck.

Linux Mint Essentials, LaCroix, J., Packt Publishing, Birmingham, UK, 2014.
ISBN 978-1-78216-815-7

Let me mention the negatives first. 1. It is fairly expensive (\$48 – \$52 range, on Amazon, paperback). 2. It is 9 years old (2014). 3. About half is devoted to the Linux Mint equivalent of DOS (the next paragraph defines what I mean by that).

If you are old enough, you will remember the early days of Microsoft Windows, when Windows was not an Operating System. Rather, it was a Graphical User Interface (GUI) built on top of a Disk Operating System known as Microsoft DOS (MS-DOS). Back then you could work in Windows or shell out into DOS where control was higher and less full of errors than the then new Microsoft Windows. Right now, Linux Mint's Graphical User Interface has gone well beyond that point in that it is error-free and a pleasure to use, but you can still shell out of the GUI (Linux Mint) into the equivalent of DOS by pressing the Terminal icon which is always present in the tray. That press opens a window on the desktop that is a text input point, also known as the Command Line Interface (in Microsoft Windows it is just called the Command Line). Fancy words ... they just mean that it is a place where you can type words that the computer will interpret as commands for it to do when you finish typing and press the Enter key!

So, I sort of count that as a negative, the fact that probably half the book is devoted to Command Line stuff, because most beginners need to focus on getting over the little hump of switching from Microsoft Windows to Linux Mint, and command line stuff is something you can develop into later if you really want to. On the other hand, it is a positive because it is a very good introduction to the Linux Mint Command Line. Well, your dollars have to go for something! Here is the chapter lineup:

1. Meet Linux Mint
2. Creating Boot Media and Installing Linux Mint
3. Getting Acquainted with Cinnamon
4. An Introduction to the Terminal
5. Utilizing Storage and Media
6. Installing and Removing Software
7. Enjoying Multimedia on Mint
8. Managing Users and Permissions
9. Connecting to Networks
10. Securing Linux Mint
11. Advanced Administrative Techniques
12. Troubleshooting Linux Mint

Appendix A: Reinstalling Mint while Retaining Data
Appendix B: Using the MATE Edition of Linux Mint
Appendix C: Using the KDE Edition of Linux Mint
Index

That is a pretty good spread of information. Appendix A itself is quite valuable, because it shows you how to do what I have long been advocating in Windows ... isolating your data from all the other stuff so it is easy to back up, and in this case, so that when you update to a newer version of Linux, your data is not overwritten. That sort of makes the book worth the price.

It is my hope that the author will come out with a new edition soon. On the other hand, the book as it stands is still quite useful and seems error-free. Get a copy if you wish to divest yourself of Microsoft Windows, or at least, give yourself some leeway with the operating system you use. It will probably be the only Linux book you ever need. Happy Computing!



On The Air Activities!

de Gary Sutcliffe, W9XT



The big radio event for March was the Wisconsin QSO party. Our goal was to defend our win from last year in the club competition. We had a pretty good turnout. I have claimed scores from AC9JV, K0DSC, K9DJT, K9QLP, W9JI, W9KEY, W9MXQ, W9XT, WA9WYI, and WT9Q.

Unfortunately, my fear that the Driftless Zone Contesters would mount a big effort came true. Despite only four entries from them that I could track down, they racked up many points.

Their average score was 112,484 points compared to the ORC's 30,736. There could be some additional scores submitted for them that I did not uncover. Based on the scores I have, we lost by over 140,000 points.

The WiQP rules require members to be within 50 miles of the club, except for mobiles. The DZC is spread out, and maybe one or two key scores are too far away to be included. I don't know how closely the WiQP sponsor checks into that.

VHF Activity and Solar Cycle Improvements

Six meters provided some nice excitement in March. The sunspots have reached a point where they will support 6-meter propagation along the equator. UV intensity is higher along the equator than at higher latitudes. This allows TEP or Trans-Equatorial Propagation if you are close enough to the equator.

Unfortunately, the Gulf States are about as far north as TEP gets. If you looked at the PSKReporter site and set it for 6 meters, you would see many links from the southern South American countries to the lower part of the US on most days.

But if we can somehow link into that region, we can contact these DX stations. Every few days, we had some Sporadic E (Es) to the south and could couple into the TEP. Sometimes signals were weak, and we could not make any contacts, but on some days we got lucky. In March, Gary, K9DJT, picked up Argentina and Chile for new 6-meter countries. I made about a dozen contacts with Argentina, Brazil, and Chile. I already had these countries but picked up a few new VUCC grids from down there.

On a few days we also had some openings to the South Pacific, including New Caledonia, Fiji, and New Zealand. Unfortunately, it never opened up to ORC territory, but a few Madison and northern Illinois stations got through. Six meters can be frustrating like that.

Es propagation is nice, but what we are really looking for is enough solar activity to support F layer propagation on 6 meters. The F layer gives us long distances on HF, but it takes more UV light from the sun to provide enough ionization as the frequency increases.

Recent solar activity has given us excellent conditions on 10 and 12 meters for the first time in years. Will it get good enough for 6 meters?

We had some great world-wide openings on the band back at the 2000-2001 solar peak. But the last peak did get high enough to provide many openings on 6 meters. This cycle is rising much faster than the last, so there is hope.

Actually, there is more than hope. We had an opening to Ecuador in early March. Several factors led me to believe it was a pure F2 layer path. First, I have two antennas on 6 meters. One is three elements at 55'. The other is five elements at about 20'. I put the low one up last summer when I found the high one had some bad nulls in certain directions. The high one is good for low angle signals you would expect from DX at low arrival angles. The low antenna is best for higher angles that are typical for Es. On that date, the high antenna provided stronger signals than the low one.

I also didn't get any decodes from the southern states or the Caribbean like I would expect if the first hop was by Es. Finally, I checked the data from southern ionosondes. Ionosondes send radio signals straight up and look for reflections. The data these provide indicate the state of the ionosphere. Although there were no ionosondes at the halfway point, the closest ones I found suggested that further south could possibly handle 50 MHz.

This opening was just a taste. The experts I talked to are very hopeful we could get some good F2 DX on 6 meters next fall if the current cycle continues on its current path. Keep your fingers crossed!

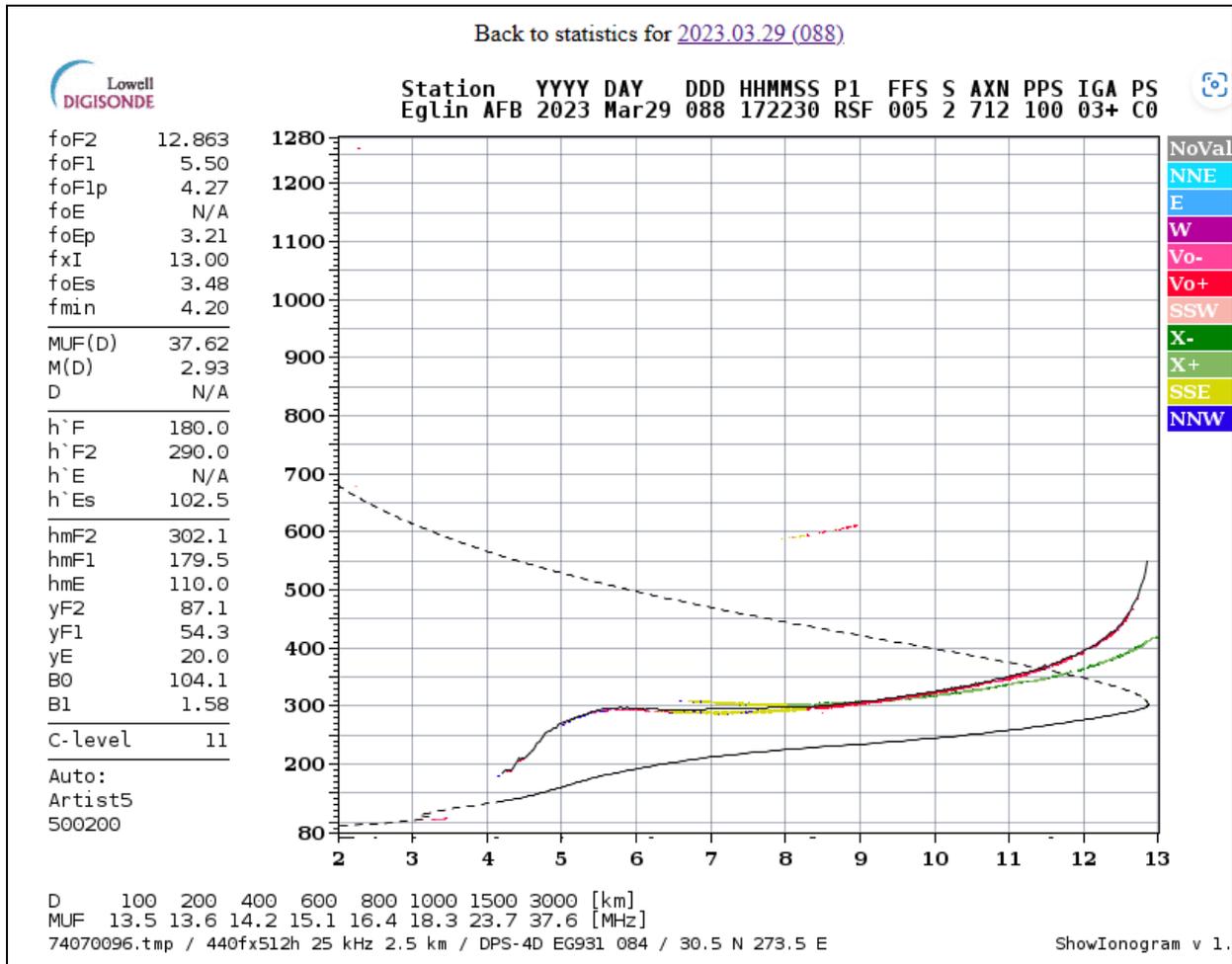
Another indication of solar activity is the increase in solar flares. Solar flares are rated C, M, and X, from lowest to highest. They are on a logarithmic scale, so an X-class flare is enormous compared to a C-class flare. C and lower-level M class flares are very common and don't usually disrupt our ham activities much. However, an X-class flare can cause an HF radio blackout for a couple of hours in the part of the earth facing the sun. A few days later, charged particles arrive if the flare is aimed our way, causing geomagnetic storms, and disrupting radio communications, especially on long polar paths.

We had the seventh X-class flare of 2023 on the night of March 28 (local time). That ties the total number of X-class flares in all of 2022. Flares become more common as we approach solar maximum.

The CY0S DXpedition to Sable Island was a chance to get a new country on 6 meters. Sable Island is just east of Halifax. They brought along 6-meter gear and had an operator specializing in VHF. Besides 6M, they did 2 meter and 432 MHz EME. Our best hope would normally be with Es, but it is 5-6 weeks too early for Es openings not in a north-south path.

They also tried meteor scatter. So, Gary, K9DJT, and I spent a fair amount of time listening for them on that mode. We copied some east coast stations calling them, but neither of us had a decode from CY0S on 6 meters via any mode.

We are really at the worst time of the year for meteors. There have not been any meteor showers in months, and random ones are rare. However, that will change this month. The Lyrid meteor shower peaks on April 15. There should be an increase in activity for a few days before and after that date.



Ionosonde data from March 29, 2023, 1722 UTC at Elgin AFB in FL. Notice the f_oF2 value of 12.86 in the upper left corner. That corresponds to the sharp upward bend of the red line. That is the maximum frequency that a vertically transmitted signal will return to the ground after being refracted 180° by the F2 layer. If f_oF2 was up around 17MHz, we could expect to see some 6-meter F2 long distance propagation. Data from Lowell Digisonde International website.

W9KW on The Ham Radio Workbench Podcast

I listen to several podcasts. A few have to do with ham radio, and some are more about engineering topics. One of my favorites is the Ham Radio Workbench (HRWB) podcast. It comes out every two weeks. The regular panelists start out talking about the projects they are working on, followed by a discussion with a guest on a particular ham radio topic.

When I got a notice that a new episode was available, I saw that the guest was W9KW. Hey! I know that call! It belongs to Jeff Whisler, who is an ORC member.

Jeff works part-time at West Mountain Radio and is involved with their battery products. Jeff talked about selecting the correct battery for your needs, proper battery care for maximum life, testing batteries, etc.

You can listen to the podcast at: <https://www.hamradioworkbench.com>

Scroll down to episode 177. A word of warning, the HRWB podcasts are long! This one is about 2:45 long. Some go over three hours! I often listen to them during the summer months while cutting the grass, which takes a couple of hours. It actually has become an HRWB joke about listeners mowing their lawns while they listened, and sometimes they mention the length of the show in the number of acres cut.

Jeff is involved in some of the initial discussions on personal projects and talks about his current effort to get on 1296 MHz moon bounce early in the podcast. If you don't want to listen to that part, jump ahead to the 1:22:30 point. This is when Jeff's special battery care topic begins.

I learned a lot in the HRWB episode with Jeff. It is well worth listening to if you use batteries for your HT, portable operations, etc.

Contests

There are no major contests in April. There are many smaller ones, like state QSO parties and other events.

Digital Library of Amateur Radio & Communications

Last month I listed the QSO Today Expo online event. I sat in on a few talks and learned some interesting things. One especially enlightening presentation was about the Digital Library of Amateur Radio & Communications or DLARC. Kay Savetz, K6KJN, the curator, presented the talk.

Websites come and go, and the contents are lost. There is a website, archive.org, which stores vast amounts of information so it will not be lost. A separate section is reserved for amateur radio and radio communications. This section is possible due to an Amateur Radio Digital Communications Foundation grant. This foundation provides grants to ham radio organizations for worthwhile projects. The web archive website is: <https://archive.org/details/dlarc>

There is an incredible amount of information, including past issues of radio-related magazines. Are you feeling nostalgic about Wayne Greens' editorials? The complete collection of 73 Magazine is available. So are issues of Popular Electronics, and full Call Books from the past. Remember the Badger State Smoke Signals newsletter? It was a monthly

publication for Wisconsin Hams. Those are there. There are also podcasts and other non-printed archive material available.

Some clubs have their old documents archived there. The QSO Today talk was given by the curator of the DLARC section. He talked about 20 interesting things he uncovered. One he mentioned was from documents submitted by the Milwaukee Radio Amateur Club. He described minutes from a meeting in the late 1940s. The janitor at the meeting location complained about cigarette ashes on the floor and asked the members to please use the ashtrays! The MRAC has over 2,300 items stored in the archive.

Another interesting item for those of us in the Milwaukee area is they were trying to put up a complete set of AES catalogs up to the time HRO bought them. So, if you are digging around and find an old AES catalog in a box or behind a shelf, let them know. They may need it.

Technology changes and storing documents and other items in different media is always difficult. They hope their information will be available for at least 2-3 generations. Storage methods change. It is costly to transfer to newer media, and equipment that used old formats may be hard to find. NASA has computer tapes from Apollo that are starting to lose their data, and working tape machines that can read them are scarce.

The archive.org/DLARC site is well worth checking out. I barely scratched the surface of the diverse material available.

The QSO Today speaker announced he was looking for club documents. Bill, W9MXQ, the newsletter editor, and I asked Bill, K9GN, the ORC President, and the ORC Board to permit our club newsletters to be archived there. There will be no cost to the club, and it will increase our visibility. There might be a decision by the time you read this.

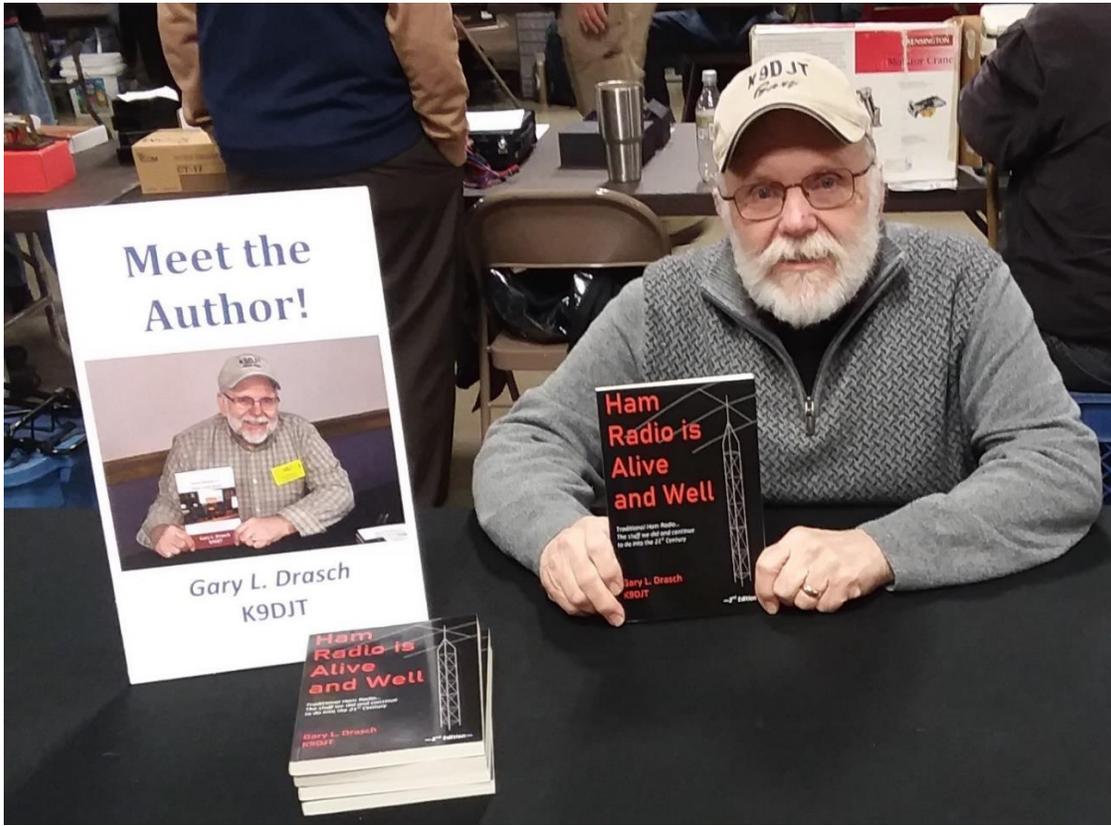
I remember hearing that one of our members was reviewing the old club records. Perhaps those could be digitized and also put into the archive. Maybe we should edit out the stuff about cigarette ashes ruining the floors at the Grafton Senior Citizen meeting room, though.

Hamfests

The Jefferson hamfest was in March. It was a good one, and several ORC members were there.

The Madison Area Repeater Association will have its hamfest at the Mandt Community Center in Stoughton on Saturday, April 15.

Don't forget the most important hamfest in the first half of the year. That is the **ORC Hamfest on May 6**. It is the same spot as the last few years. Help the club and buy a ticket from Tom, KC9ONY, at the April club meetings. The club will also need volunteers to help. I already have my ticket and table reserved.



Gary, K9DJT, selling copies of the second revision of his book "Ham Radio is Alive and Well" at the Jefferson Hamfest.



Tom, KC9ONY, selling ORC Swapfest tickets at the Jefferson Hamfest.

Contests

There are no major contests in April. There are many smaller ones, like state QSO parties and other events.

Rig In a Box DXpeditions

If you look at the list of the top 25 rarest DXCC entities, you will see that many of them are nature preserves of one sort or another. The administrators limit or prohibit DXpeditions to these locations for fear that they will disrupt the wildlife there.

Occasionally a small group is permitted an operation in these areas. One example is the CY0S DXpedition to Sable Island that happened at the end of March. They were limited to a smaller group than they hoped for, needed to stay in a small area, and were not permitted to interact with the wild horses that inhabit Sable Island.

When DXpeditions have been allowed to operate in such areas, they have an excellent track record of following the rules. Often they have to pay the way for government observers and are not allowed to leave *anything* behind. Despite this record, it may be years before another operation is permitted.

Five of the top twenty most needed DXCC entities are US possessions with restricted access.

There are efforts to reduce DXpedition footprints on the location to the bare minimum in hopes of making it easier to get permission to land and operate. One attempt is the Rig In a Box (RIB) concept. It is a complete self-contained station in a sealed container with remote operation capability. A small crew moves it to the island, sets it up with power and antennas, then retreat back to the boat and remotely operate the station(s) via a radio link.

You have a couple of people spend a few hours setting up a RIB and antennas instead of a dozen or more operators, tents, and all the other things necessary to support a big operation for a week or more. The RIB crew makes a few short trips to refuel the generators daily, and no one is on the island overnight. Another advantage is that time setting up the living infrastructure is eliminated, maximizing operating time.

There is an operation using this going on now. FO/AA7JV is operating from French Polynesia into early April. They have two RIBs, one with two 100W stations dedicated to FT8 and one capable of running a KW for CW and SSB. An RF link to the ship controls the CW/SSB RIB. The FT8 RIBs can be operated remotely through Starlink satellites. I worked them on 30 meters on March 30. I believe they will be making additional stops during April.

Check out the AA7JV QRZ page. <https://www.qrz.com/db/AA7JV>

They even have an amphibious landing craft that would make the Marines proud! The "boat" they are operating from is not exactly bad either!

Is this the future of DXpeditions? I have mixed feelings about that.

DXpeditions

DXpeditions tend to be down in April, but this month is a good one. The combination of improving conditions and some that were delayed by COVID are now happening, helping to keep things interesting on the HF bands.

A trio of Brazilian hams will head to the San Andreas Islands May 2-20. They will be signing HK0/home call. The bands are 80-6 meters, SSB, CW, and FT8. They would be a fine catch on 6 meters.

Monaco will be activated with the call sign 3A2AB during the whole month of April to celebrate the 100th anniversary of the first shortwave contact between France and the United States. The French operator was born in Monaco. The ham radio association in Monaco is putting on this special event station.

Monaco is one of those that is kind of a hit-or-miss DXCC entity. I don't know how active they will be, but it is worth putting them in the log if you hear them.

A trio of European hams will operate from Timor-Leste from April 10-22. Timor-Leste is in the Pacific Ocean near Indonesia. This activation will be a scouting group for a bigger operation in late November and the CQ WW CW contest.

They will be operating CW, SSB, and RTTY this time. No FT8, but their website says they may do FT8 in November. Also, only 40-10 meters will be used on this trip. No call has been assigned yet but look for a call sign either starting 4W or a portable call with 4W.

Timor-Leste is a reasonably rare country. It gained its independence in 2002 from Indonesia. The CIA World Factbook website suggests US citizens use "increased caution" if traveling there. Civil unrest and crime have probably cut down on DXpeditions to this country.

Easter Island will be on through the end of April courtesy of CE0YHF. He will use the HF bands plus 6M, CW, and FT8/4. It might be QRP only, so listen carefully.

A last-minute arrival, just before the newsletter deadline, is that Spratly will be on April 30-May 9. The call is DX0NE. I am excited about this one, but I am not getting my hopes up too high. Things have gone very bad on previous activation attempts.

The Spratly Archipelago is located in the South China Sea. Many countries, including China, Vietnam, Taiwan, Philippines, Malaysia, and Brunei, claim the islands. It is in a

major shipping lane, contains important fishing grounds, and has oil and natural gas deposits. Bird guano is also mined at some locations.

The different countries are each trying to maintain their claims for economic and military reasons. China has been creating islands in the region to solidify its control of the area. Tensions are high. No one lives on any of the islands, but some of the countries have military garrisons based on some of the islands.

In the 1980s, a group of German hams was shelled by a Vietnamese military outpost as they sailed nearby on the way to their operating island. There were fatalities.

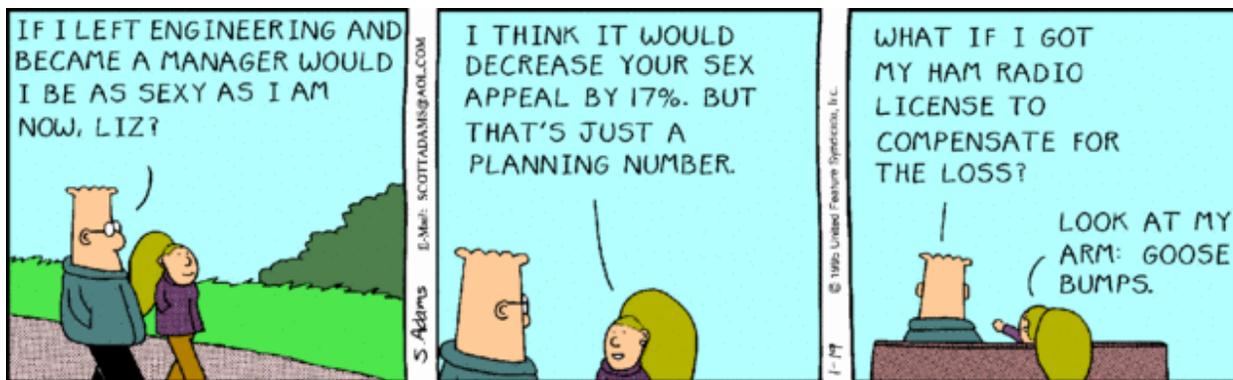
A later DXpedition group had permission from one country. They landed and began operating. However, a rival DX group contacted the government of another country, claiming the islands to tell them some people were occupying their islands. They sent out naval ships to chase the operators off the island.

The last operation was in 2018, but it is a challenging path at low sunspot times, and I doubt a lot of stations from this area worked them then. My last QSOs with Spratly were in 2001 on 15- and 20-meter SSB.

This operation was initially scheduled for last year but was canceled for safety reasons. Hopefully, it happens, but more importantly, no one gets hurt. There were supposed to be several operators, but all but one had to cancel due to time conflicts.

There are other smaller one person operations in April. Usually, they are part of work or vacation travel, and contacting them depends on how often and when they operate. Often they find less operating time than expected, and free time occurs when we have no propagation. I made an exception this month for the Easter Island and Spratly operations. Easter Island has a long duration, and the Spratly effort is specifically for operating.

That wraps up April. The days are getting longer, and the higher bands stay open very late with the longer daylight and sunspots. Check them out!



Check the following page for my April and Early May Events and Opportunities . . .

W9XT's Contest, Operating, DXpedition, and Special Event Picks for April and Early May 2023

W9XT's DXpedition picks for April and early May 2023					
QTH	Dates	Call	Bands	Mode	Link/notes
Monaco	Apr 1-30	3A2AB	HF		Special Event
Easter Island	To Apr 30	CE0YHF	HF + 6M	C/D	
Timor-Leste	Apr 10-22	4W?	40-10	C/S/R	http://www.timor-leste-dx.de/
Spratly	Apr 30- May 9	DX0NE	160-6		
San Andreas	May 2-20	HK0/home call	80-6	C/S/D	Brazilian hams using portable calls

Modes: C = CW, S = SSB, R= RTTY, D = Digital (may include RTTY)

W9XT's contest picks for April and early May 2023					
Name	Start	Length	Bands	Mode	Link
Take a break					No major contests this month

Dates/Times in UTC. Subtract 5 hours from UTC to get local (CDT).

HF = 80, 40, 20, 15, 10 Meters

W9XT's operating & event picks for April and early May 2023			
Event	Dates	Details	Link/notes
Lyrid Meteor shower	Peak Apr 15	+/- a few days, 6 & 2M	
Madison Ham-fest	April 15		http://www.w9hsy.org
ORC Hamfest	May 6		https://www.ozaukeeclub.org/

W9XT

2023 World Amateur Radio Day is 18 April 2023

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What: 2023 World Amateur Radio Day

Who: All amateur radio operators worldwide

When: Tuesday, April 18, 2023, at 0000 UTC until Wednesday, April 19, 2023, at 0000 UTC

Where: A global event covering all regions of the International Amateur Radio Union (IARU)

Why: World Amateur Radio Day, held on April 18 each year, is celebrated worldwide by radio amateurs and their national associations which are organized as member-societies of the International Amateur Radio Union (IARU). It was on this day in 1925 that the IARU was formed in Paris. American Radio Relay League (ARRL) Co-Founder Hiram Percy Maxim was its first president.

Amateur radio experimenters were the first to discover that the short-wave spectrum could support long-distance radio signal propagation. In the rush to use these shorter wavelengths, amateur radio was “in grave danger of being pushed aside,” the IARU’s history has noted. Amateur Radio pioneers met in Paris in 1925 and created the IARU to promote the interests of amateur radio worldwide and to protect and enhance its spectrum privileges. Today, the IARU is a federation consisting of more than 160 national amateur radio organizations in as many countries and separate territories. The International Secretariat of the IARU is ARRL The National Association for Amateur Radio® in the United States.

On World Amateur Radio Day, all radio amateurs are invited to take to the airwaves to enjoy our global friendship with other amateurs, and to show our skills and capabilities to the public.

How: World Amateur Radio Day is not a contest but rather an opportunity to “talk” about the value of amateur radio to the public and our fellow amateur colleagues. It is also a great opportunity to talk about your radio club and amateur radio in local media as a lead-up to ARRL Field Day (held each year during the fourth full weekend in June) and another ham radio related activity in your community – such as volunteers who serve in local emergency communication readiness including the ARRL Amateur Radio Emergency Service®.

More Information:

www.arrl.org/world-amateur-radio-day/

www.iaru.org/on-the-air/world-amateur-radio-day/

www.iaru-r2.org/en/on-the-air/world-amateur-radio-day/

Vintage Amateur Radio

de: Bill Shadid, W9MXQ



In the last installment, we discussed the introduction of the Hammarlund HQ-215 Amateur Radio Band Receiver. While not revolutionary in the marketplace as a receiver, it was revolutionary for Hammarlund as a design. This was the first all solid-state receiver from a manufacturer that had been making competitive receiver since well before World War II. When I was licensed in 1964, Hammarlund was a major market performer with their established and respected HQ-110A and HQ-170A Amateur Radio Band and their HQ-100A, HQ-145A, and HQ-180A General Coverage Receivers.

At this time, in 1969, very few competitive radios were solid state in the popular prices amateur radio marketplace. In fact, the HQ-215's main competition was the popular, and high performance, Collins 75S-3C. As related before, the 75S-3C was the same as the 75S-3B except that the "C" model provided 28 band positions of 200 kHz span against 14 positions in the "B" model,. The HQ-215 with 24 of the 200 kHz span ranges was closer to the 75S-3B feature set.

At the same time, while perhaps a quantum leap in technology for Hammarlund and their focus on vacuum tube products, it missed the growing market fervor for a transceiver, or at least a matching transmitter that would transceive with the HQ-215 in control for frequency.



Hammarlund HQ-215 HF 80-10 Meter Ham Band Receiver (1969)

W9MXQ

To support the idea that a transceiver or transceive capable transmitter was a necessity, Hammarlund appears to have at least recognized the need for a transceiver but not much is left for history to reference. One source¹ indicates that in 1964, Hammarlund produced 25 prototypes of an HXQ-300 Transceiver that covered 160-10 meters that had an input power of 300 watts SSB and 275 watts CW at a target price (in 1964) of \$750.00. Supporting accessories included an AC-300 AC Power Supply//Speaker at \$99.50 and a DC-300 DC Power Supply for \$109.50. Actually, the source indicates this to be a transmitter, but Hammarlund had established “HX” as its transmitter model prefix and “HQ” as its receiver model prefix. It seems more logical that “HXQ” would be a transceiver².

The only picture I can find on any possible remaining HXQ-300 seems to be a reworked KW Electronics (UK) KW-2000 Transceiver³. I will not show it here because it very well could be a fake. More research is necessary. Even if the design was taken from KW electronics, if this were a true prototype they would have at least removed the KW name from the front panel.

Later in this installment you will see reference to a sister receiver to this HQ-215 for which one prototype seems to have survived. It is a pity that none of the 25 prototype HXQ-300 Transceivers seem to have survived. Or perhaps they will someday appear out of one or more collectors' inventory.

Drawing Hammarlund's focus together, the HQ-215 Receiver (and presumably the HXQ-300 Transceiver) seem to have been designed to compete for United States Military and US government agency business. This was for HF SSB receiving and transmitting equipment used by the Department of State for embassy installations and for MARS⁴ installations.

Over the years, Collins Radio Company had held onto that business with the Collins Gold Dust Twins in the 1950's:

1. 75A-4 SSB/AM/CW Receiver
2. KWS-1 SSB/AM/CW Transmitter

And, following on in the 1950's with the newer Collins S-Line:

1. 75S-2, 75S-3A, and then 75S-3C SSB/CW Receiver
2. 32S-2 and then 32S-3A Transmitter
3. KWM-2A Transceiver
4. 30L-1 and 30S-1 Linear Amplifier

The United States procurement operations had, over the years, encouraged others to match the specifications of the S-Line product from Collins and provide competitive bidding. While Collins had led the way in providing high performance equipment for use in the MARS application, government procurement will always attempt to assist in reaching lowest possible cost by ensuring that competitive bidding is possible. This occurs even

when it was the same government agency that initially developed the product with the first manufacturer!

Hammarlund was not first in this competition. In the 1960's, the most prevalent setup for the United States Government buyers was a typical 75S-2 receiver and 32S-2 transmitter (equipped also with a 30L-1 Linear Amplifier, 312B-4 Station Console, and 516F-2 AC Power Supply). With some prodding by the buyers, another American Company, Radio Engineering Laboratories (branded RELiant – using the three initials of the company name as the first three letters of the word RELiant) came to the table with the R-119 Radio System – as shown here:



Left to Right in the RELiant S-119 Radio System:

(with equivalent Collins models in brackets)

RELiant L-103 Linear Amplifier (30L-1)

RELiant R-104 Receiver (75S-2)

RELiant T-104 Transmitter (32S-2)

RELiant M-135 Station Console (312B-4)

RELiant P-109 AC Power Supply for T-102 (not shown)(516F-2)

WQ9E

Radio Engineering Laboratories was also the owner of Eldico Electronics who was their manufacturing arm. These radios and accessories were also marketed under the established Eldico brand using the same model numbers. That is, a RELiant R-104 Receiver was also sold as an Eldico R-104. Perhaps differing only as to government vs amateur radio customers.

I often saw the RELiant and Eldico versions of the Receiver and Transmitter at hamfests in my early years in ham radio (mid-1960's into the 1970's. I have never personally seen the Linear Amplifier, the Station Console, the Transmitter Power Supply, or the remotely mounted Power Supply for the Linear Amplifier. The Receiver and Transmitter would operate separately or transceiver off the Receiver VFO. This was just as the Collins would do. Presumably, but not verified, the Collins and RELiant/Eldico Receivers and Transmitters could be mixed and worked as a system using either brand for one and a different brand for the other⁵.

So, compatibility seems to me to have been a requirement back when the RELiant products was proposed. Was the functionality of the overall system the compatibility requirement or was it interoperability by individual component? To this day, I do not know the answer to that question. However, It is reality that Hammarlund designed the HQ-215 Receiver to be compatible with the Collins 75S-3C Receiver in terms of conversion scheme and also in terms of in and out connection to the transmitter on the back panel of

the HQ-215. If truly compatible, they would interconnect and even transceive using the HQ-215's VFO to drive the Collins 32S-(x) series Transmitter. I have always wondered if this would work!

Testing interoperability has been a long-time goal for me. I had an HQ-215 once in previous times, but at that time did not have any Collins equipment. I wondered about this feature at the time. In the 1980's I had a complete Collins S-Line station but then had no HQ-215. I still wondered about this feature – and continued to think about it. Was there no way to test this theory? Well, now with both S-Line Receiver and Transmitter setups, KWM-2 and KWM-2A setups, and the recent addition of an HQ-215 allows me the opportunity for a proper test of this capability. Finally!!⁶

Below is the setup for the test. . .



Test Setup – Separate and Transceive Enabled Collins Transmitter and Hammarlund Receiver Setup

Left to Right

Collins 32S-3 Transmitter, 312B-4 Station Console,
and Hammarlund HQ-215

W9MXQ

The Collins 32S-3, on the left, is generally tied up with a Collins 75S-3 Receiver that is part of my station. The 75S-3, 75S-3A, 75S-3B, and 75S-3C look the same to their partner Collins Transmitter⁷.

Rear Panel Interconnections are as follows:

Signal Lines Interconnecting the Transmitter and Receiver			
Connection Jacks on Collins 32S-3		Connection Jacks on Hammarlund HQ-215	
Connector Name	Explanation	Connector Name	Explanation
REC ANT ⁸	Antenna to Receiver	ANT ⁸	Antenna
XTAL OSC (J1) ⁹	Inside the Cabinet	HF OSC ⁹	HF Oscillator
VFO Output (J2) ⁹	Inside the Cabinet	VFO ⁹	Transmitter VFO
ANTI VOX ¹⁰	Audio Sample	500 Ohm ¹⁰	Audio Sample
CW SIDE-TONE ¹⁰	Audio Signal	No Connection	
REC MUTE ¹⁰	Mute Line	MUTE ¹⁰	Mute Line

The lack of a sidetone connection was a disappointment – but not unexpected as these installation were mostly intended for SSB operation. And, after owning multiple Hammarlund receivers over the years I have to recall that the feature was never present.

So, after all these years of wondering did it work? Well, it kind of worked. I found initially that it worked fine. I made the connections, tuned the transmitter with the receiver feeding VFO signal to the mixer (and the HF Oscillator feeding output to the transmitter as well). All worked fine, I checked into MidCARS (7.258.0 MHz), and received a good report. After that I worked several other stations running POTA events then let the radio sit on standby for a few hours while I did other things. Upon return, the transceive function would no longer work. All other functions were fine – spotting, muting, T/R switching – but not transceiving. I have yet to find the issue. So, partial success. Worked beautifully then failure. I am confident it will work again. Likely some failure in the patching setup that feeds the VFO and/or the HF Oscillator back and forth. The radios work very well independently.

Forgetting the transceive issue – which is important to me, but not to everyone – the use of the receiver has been good. It has a lot of problems from sitting for a very long time. Two other hams will report in this article on the HQ-215 (actually, one is using the general coverage variant, the HQ-225, identical except for frequency coverage). You will hear from me and my experience plus you will hear from Clark Thompson, K9OA, and his HQ-225, and you will hear from Bob Bailey, W9DYQ, and his HQ-215. Clark and I use our radios mostly for SSB and AM phone. Bob is nearly 100% CW, so his take on the radio and his demands on its performance are from a different perspective.

Starting with Clark, K9OA, let's first look at outward differences between the two models. Keep in mind, as previously said, both radios are identical except for front panel silk screening, frequency coverage, and the standard filter that comes with the radio.

The HQ-215 comes with an SSB filter and can be equipped with filters for CW and AM. The HQ-225 comes with an AM filter and can be equipped with filters for SSB and CW. All three filters are the same – and both receivers can accommodate all three at once. The front panel shows a different lettering setup for the Preselector and for the BAND switch. The internal circuitry is the same but with different frequency offerings.

Actually, an HQ-215 could accommodate the same range crystals as the HQ-225 and cover those shortwave listening (SWL) ranges. At the same time, the HQ-225 could accommodate the same range crystals as the HQ-215 and cover those ham band ranges.

Note: No real documentation exists for the Hammarlund HQ-225 Receiver. If it ever did, it is long gone. However, since it never got to the marketing stage, it is very possible that only some long-lost engineering notes were ever put to paper. The general coverage circuitry of the radio lent itself well to offering coverage in different portions of the spectrum with only front panel nomenclature being different.

Small note here, however, while the chances of finding an HQ-215 are very, very slim, there is only one known HQ-225 in the field and we believe that Clark, K9AO, has it. So, with a population of one – there is not much chance of finding one unless Clark lets his go!! At the same time, with the thinking that only a few hundred of the HQ-215 exist in the field, Bob, W9DYQ, and this writer seem to have two of these rare radios.

Here is how the two differ outwardly:



Hammarlund HQ-215 Receiver

W9MXQ



Hammarlund HQ-225 Receiver

K9OA

In the previous article, you saw the ranges of coverage for the HQ-215. I will repeat them here, somewhat abbreviated, for reference then go onto the coverage in the HQ-225:

Hammarlund HQ-215 Receiver Frequency Coverage:

A standard radio provided 11 ranges with 13 ranges remaining open for the installation of optional range crystals. Here is a breakdown of that selection:

- Range Note 1: 3.4 to 4 MHz – Three crystals supplied – none open.
 - 3.4 to 4 MHz covered, 3.4, 3.6, 3.8 MHz supplied crystals.
- Range Note 2: 4.0 to 5.8 MHz – All three ranges open.
- Range Note 3: 5.0 to 10.4 MHz – Two crystals supplied – three open.
 - 7.0 to 7.4 MHz. covered, 7.0 & 7.2 MHz supplied crystals.
- Range Note 4: 10.4 to 17.4 MHz – Two crystals supplied – three open.
 - 14.0 to 14.4 MHz. covered, 14.0 & 14.2 MHz supplied crystals.
- Range Note 5: 17.4 to 25.4 MHz – Three crystals supplied – two open.
 - 21.0 to 21.6 MHz covered, 21.0, 21.2, 21.4 MHz supplied crystals.
- Range Note 6: 25.4 to 30.2 MHz – One crystal supplied – two open.
 - 28.5 to 28.7 MHz covered, 28.5 (28A) MHz supplied crystal.

Hammarlund HQ-225 Receiver Frequency Coverage:

Noting again here that no documentation exists for this model, a review of the front panel and the installed crystals would indicate that a standard radio provided 20 ranges with 4 ranges remaining open for the installation of optional range crystals. Here is a breakdown of that selection:

- Positions A & B are Open
- 60 Meter Band

- 4.7 to 4.9 MHz
- 4.9 to 4.0 MHz
- 40 Meter Band
 - 5.9 to 6.1 MHz
 - 6.1 to 6.3 MHz
- 41 Meter Band
 - 7.0 to 7.2 MHz
 - 7.2 to 7.4 MHz
- 31 Meter Band
 - 9.4 to 9.6 MHz
 - 9.6 to 9.8 MHz
 - 9.0 to 10.0 MHz (WWV)
- Positions C & D are Open
- 25 Meter Band
 - 11.7 – 11.9 MHz
 - 11.9 – 12.1 MHz
- 19 Meter Band
 - 15.0 – 15.2 MHz
 - 15.2 – 15.4 MHz
 - 15.4 – 15.6 MHz
- 16 Meter Band
 - 17.7 – 17.9 MHz
- 13 Meter Band
 - 21.4 – 21.6 MHz
 - 21.6 – 21.8 MHz
- 12 Meter Band
 - 25.6 – 25.8 MHz
 - 25.8 – 26.0 MHz
 - 26.0 – 26.2 MHz

In this writeup, Clark Thompson, K9OA, relates his experience using then Hammarlund HQ-225 Receiver. Clark's words are his own – unedited . . .

I acquired this receiver in 2008 after responding to a classified ad in ER magazine. I have never used a HQ-215, so I can't comment on any differences in performance between the two.

The HQ-225 came supplied with only a 6 kHz wide mechanical filter, which is appropriate for listening to AM transmissions. (I later added a 2.1 kHz filter.) Overall, the receiver has very good performance. It is sensitive throughout its tuning range, and it is not excessively noisy. The AGC time constants are well chosen; I prefer it over my Collins 75S-3 on SSB. The front end handles strong signals quite well, considering the early solid-state design. I have not noticed any cross modulation or overload. The stability is excellent after a twenty-minute warm up.

The one area of performance where the HQ-225 is not up to par is the audio amplifier. Just as with the HQ-215, there is audible hum with the volume at low levels. This is not related to power supply filtering, but rather is the result of hum induced from the power transformer and also lead dress to the volume control. I found that placing a mu metal shield around the power transformer reduces the hum to a tolerable level.

Overall, the HQ-225 is a very competent receiver. But the 200 kHz tuning ranges make it a bit cumbersome to cruise the bands. And unfortunately, there's not much to listen to any more on the international shortwave broadcast bands! **K9OA**

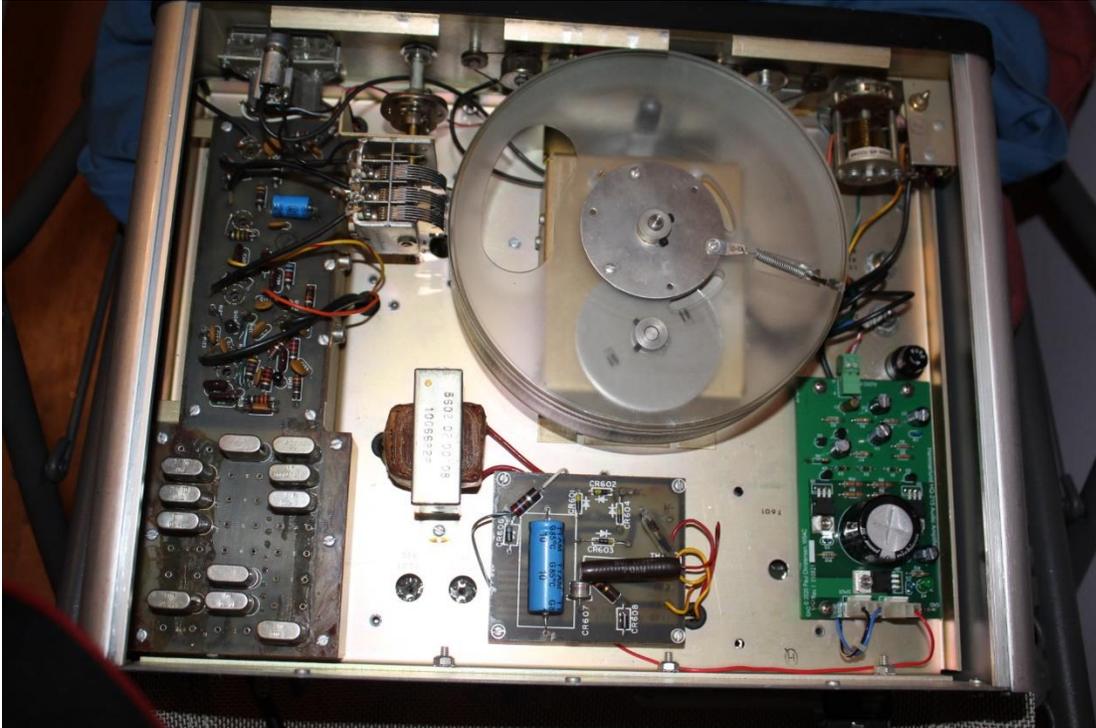
You saw the front panel earlier in this article – as a comparison with the front panel of the HQ-215 and HQ-225. Clark and I have since had several conversations on the two receivers. Here I want to show you how Clark attempted to mitigate the noise caused by the magnetic field emitted by the Power Transformer:



**Bottom View – Hammarlund HQ-225 at K9OA – Front Panel at Top.
Note Mu-Metal shield material wrapped around the power transformer that is to the right of the Power Supply board.**

K9OA

Just as a reminder, here is the HQ-215 at W9MXQ, again, showing the retrofit Audio Amplifier Board once set to be marketed by Paul Christensen, W9AC. Note the relocated AC Power Transformer and the now removed (displaced by the new circuit) audio transformers.



**Bottom View – Hammarlund HQ-215 at W9MXQ – Front Panel at Top.
Note two missing audio transformers at the lower right where the new W9AC Audio
Amplifier is mounted. Also note the relocated
AC Power Transformer that is now to the left of the Power Supply board.**

Now, here are some impressions of using the Hammarlund HQ-215 from my friend (since we were kids together in Central Illinois), Bob Bailey, W9DYQ. Bob is also a long-time proof-reader and contributor to my efforts to make these articles as close to reality as possible. As he mentions, Bob is almost exclusively a CW operator who makes infrequent forays into the digital modes. So, Bob brings an analysis of the radio from a CW operator's point of view.

I work primarily CW, so that will be a baseline. The receiver is pleasant enough with stronger signals. Controls are well marked, and responsive.

I should mention that I operate the receiver on a 12Vdc supply. This seems to mitigate some of the issues caused by the design of the internal power supply that creates a good deal of noise making its way into the recovered audio. An important point to note I found in my radio that as I would adjust the dial/meter lamps to from off to full brilliance [pot at the left side of the readout window] the frequency would shift. I always felt that the power supply in the radio was based on a repurposed filament transformer and was insufficient to the task,

With strong CW signals the RF and AF gains can be kept low enough to provide a reasonably comfortable listening experience. However, for weak signal work the radio is tiring to use. Both the RF and AF amplifiers are noisy, and the noise rolls in fairly quickly as the gain levels are brought up. The RF amp is hissy, the hiss is only partly eliminated with the 500 Hz CW filter. The AF amp has both a hiss noise and has a hum. As you bring up the Audio level the hiss will override the hum. So, for a weak signal you try to balance the RF hiss against the AF hiss. The best way to work with it is to set the audio level to what you like, then ride the RF gain as you would with older vintage gear.

The receiver hears well, and the tuning rate is easy to use, it is slow enough that even with the CW filter online you will hear the weak signals before you tune through them. The band preselector is quite peaky, so fine tuning is required as you tune through the 200KHz band. Warm up is quick, with only a bit of drift in the first minute or two. Once it is stable the frequency from one band to the next is very close. For example, W1AW on 20 is at 14047 MHz, if you then select 40 meters you will have W1AW tuned in at 7047 MHz.

One weakness in the HQ-215 design is the lack of ability to properly align the optional filters installed in the radio. A look at the schematic diagram for the radio shows that the optional filters {as well as the stock filter} are missing any way to make necessary alignment of any field installed filter. This practice is not uncommon with the various manufacturers and at the same time shows why the Collins S-Line will outperform this radio – even when using the same filters.

Overall, it's a nice receiver to use, however it comes across as not quite a top shelf rig. It is a radio that has a lot more potential than it is able to deliver due to some unfortunate design issues. **W9DYQ**

Finally, my own impressions of this radio.

My use of the radio has been mostly on SSB, with a good sampling of AM operation as well. I do not have the Collins AM filter as offered as an option from Hammarlund. However, listening to AM on the ham bands with the stock Collins SSB Mechanical Filter is more than adequate if a bit restricted as to bandwidth. I did operate the radio for several CW contacts – and for that I borrowed the stock Collins 500 Hz Mechanical Filter from my Collins 75S-3B to run my tests.

For SSB contacts I found the radio more than adequate with a lot of similarities to the Collins 75S-3B¹¹ (and sister 75S-3C) Receiver. Since I do not have the Collins AM Mechanical Filter in the 75S-3B, I could not swap it into the HQ-215. So, unlike Clark, K9OA, I could not duplicate the sound of his HQ-225 on AM.

On CW there is noise present in the i-f chain that is not present in an A-B comparison with the Collins 75S-3B. Where the Collins receiver is comfortable listening and operating the HQ-215 can become irritating. When I say that, remember that

my HQ-215 benefits from the lower noise performance in my receiver due to the installation of the now unobtainium W9AC Audio Amplifier retrofit. Also, due to the more efficient use of power by the W9AC modified radio, the pulling of frequency by the high current drain of the stock power supply is not obvious. [Remember, that W9DYQ side steps the radio's power supply limitations by using an external DC power supply.

While I will probably draw the ire of my Collins S-Line friends, I prefer the rather imaginative analog readout on the HQ-215 when compared to the Collins offering in the 75S-3B (and all S-Line Receivers and Transmitters).

With respect to installing optional filters, the inability to align the optional filters in a particular radio – even one HQ-215/225 to another – is something that W9DYQ and I have discussed at length concerning optional filters for Swan/Cubic Astro series transceivers, the Swan 600-R and 600-R Custom receivers, and others.

Back to SSB use of the radio, I enjoy using it and find it comfortable with good sensitivity and selectivity. If I had any complaint it would not be tied to the basic design of the radio – rather to its ability to be stored for many years and brought back to life. My example of the HQ-215 seems plagued with problems with the bandswitch. The 24-position switch is on the delicate side and the switching of the many 200 kHz tuning range crystals has been problematic. **W9MXQ**

Finally, I have some thoughts on Hammarlund's purpose here. Business remained in the late 1960's for US Government and Military use of HF SSB and CW communication equipment. Collins by that time had pretty much focused on the Collins KWM-2A Transceiver, but the demand for the 75S-3C Receiver and 32S-3A Transmitter did exist. Is that where Hammarlund was going? It takes on some credibility where the, what appears to be ill-fated, HXQ-300 Transceiver was concerned. The missing piece of that puzzle is the completely non-existent matching transmitter. Such a transmitter would have been needed to fully compete with Collins. However, it is also true that even the transceive connectable transmitter was fast fading from the market by that time.

To be sure, several examples of the Receiver coupled with a standalone Transceiver existed after the time (1968 to 1972, at the most) that the HQ-215 was on the market¹².

I appreciate that you read my articles. Remember that I am open to questions and comments anytime at my email address, W9MXQ@TWC.com.

A special note of thanks to my proofreader, Bob Bailey, W9DYQ. Bob is a lot more than a proofreader as he often adds commentary that makes it into the article. Certainly, in any technical article, it is good to have a second person review the thought process.

Notes and Comments:

- ¹ This comes from information found at <https://www.hammarlund.info>
- ² In years past, I think before 1970, I remember seeing references to a “soon to be released” Hammarlund HXQ-300 Transceiver. I cannot show this as an actual reference at this time.
- ³ Info from <https://www.hammarlund.org>
- ⁴ MARS is an abbreviation for Military Auxiliary Radio Service <https://www.mars.af.mil/>
- ⁵ I cannot verify transceiver capability with different brands in this example.
- ⁶ I do not make claims in these articles that I cannot test on my own. Articles are always from my own experience
- ⁷ Here is the breakdown of the Collins Receiver models mentioned herein:
 - The 75S-1 – initial Collins S-line Receiver, dating from 1959.
 - The 75S-2 – as above but with added bandspread.
 - The 75S-3 – updated S-Line Receiver with Rejection Tuning – from 1961
 - The 75S-3A – as above but with added bandspread.
 - The 75S-3B – further updated from 75S-3 – from 1963
 - The 75S-3C – as above but with added bandspread.
- ⁸ Regular Shielded Cable – RG-58 or RG-174 – RCA Phono Plug Ends – 36” to 48”
- ⁹ Controlled Impedance – RG-58/U – RCA Phono Plug Ends – 36” long
- ¹⁰ Shield Audio Cable – RCA Phono Plug Ends – 36” to 48”
- ¹¹ The reference in this and the previous article on the HQ-215 relates its design being based on the 75S-3C. The 75S-3B mentioned and 75S-3C are identical except for the number of available 200 kHz tuning ranges.
- ¹² Transceivers offered with matching/compatible receivers will be covered in future articles.

© **W9MXQ**



Hammarlund is still Loved in the Hearts of Collectors

W9MXQ in the Hammarlund Hullabaloo in 2021
Collins KWM-2 Transceiver with Hammarlund HQ-170AC Receiver
Next time – the HQ-215 will be in this event!!

W9MXQ

Ozaukee Radio Club Minutes of Membership Meeting. 03/08/2023

de: Ken W9GA, Secretary

The monthly ORC meeting occurred at the senior center as we have returned to live in-person meetings, along with a streaming version held via Zoom. ORC President Bill K9GN began the meeting at 7:33 PM, with actual members attending, a go-around was conducted. Zoom attendees were also in attendance and were introduced individually. Bill asked if anyone could join the Technical committee and help with the streaming meeting presentation.

Program:

Our presenter was Pat W9JI with a topic of the Viking Valiant transmitter. This was a product of the E.F. Johnson company (Ham equipment starting 1949) and Pat talked about this radio, as a candidate for someone wishing to get into collecting older tube type Ham gear. He gave a little history of the models leading up to the Valiant; he then gave us a general description of this transmitter. He then went into some detail with the types of issues in reclaiming a radio of this vintage. (Some topics; fuse sizing, cleaning, recapping, replacement parts, HV arcing of critical areas, the 'special' 18K ohm resistor, plus others.)

50/50 Raffle:

This was won by Nancy KC9FZK, winning an award of \$16.00

Scholarship Auction:

Stan WB9RQR held a short auction; included: an Icom IC-2AT, an ARRL Handbook, 2 laptops.

Committee reports:

(There were no first VP, no second VP and no RPT VP reports.)

Treasurer: Gary N9UUR provided reports, ORC now has about 124 paid members for 2023. The February treasurers' report was accepted; motion by KC9FZK; 2nd by W9GA & carried.

Secretary: Ken W9GA reported that the March 2023 minutes are posted, a motion to accept was made by N9VSV; 2nd by WT9Q & carried.

Scholarship/STEM: Pat W9JI will be holding another STEM committee zoom meeting soon, and they are working on a charter for the ORC participation.

Tech committee: Gregg W9DHI has mentioned that the technical support of our online streaming of the meetings will be spending about \$200 for additional equipment.

OLD business:

Ken W9GA reminded everyone that Ham Of The Year and Turkey Of The Year nominations are still open, plus any other awards as listed in the bylaws.

W9GA also affirmed that we have the Pleasant Valley nature park reserved for FD2023.

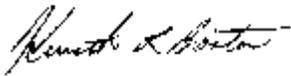
NEW business:

Tom W9IPR informs us that Tower Electronics won't be present at the Fall Swapfest; Gary W9XT asks for members to get on the air for the WI QSO party; Mike KE9MY has said that the new rules for ARRL FD are now published and have some changes; notable is the improvement of the points accumulation for the GOTA station; Tom KC9ONY has tickets and tables available now for the Spring Swapfest; WH6ZZ was spotted on 20 meters lately!

Adjournment:

WB9RQR moved to adjourn, KD9RMX 2nd, motion carried; time ending was 8:58 PM. There were 24 in-person attendees, 15 Zoom attendees.

Respectfully submitted,



Kenneth Boston W9GA, Secretary



Upcoming ORC Monthly Meeting Programs

de: Pat Volkmann, W9JI

- April – Mike Harrington, KD9GCN, “Operating a Remote Ham Station”
- May – Bill W9MXQ & Pat W9JI – Video: “Collins: The Lost Decade” and a brief tour of a Collins collection
- June – Ken W9GA Field Day
- July – Jeananne N9VSV – Collecting Amateur Radio Themed Stamps
- October – Janice KA9VVQ and Bruce W9FZ – “Getting on the Air and Having Fun with Roving!”

Please consider sharing some of your experiences with the rest of us. If you have an idea and would like some help putting a program together let me know.

Creating a Presentation

Many of our presenters use Microsoft’s PowerPoint to organize and present their information. If you don’t have access to or aren’t familiar with Power Point there is an alternative. The Open Office package contains Impress, which is similar to PowerPoint. Impress is easy to use and available at no charge. You can check out OpenOffice here: <http://www.openoffice.us.com/>

We are fortunate to have a number of very talented people in our club, many of whom have shared their knowledge through a presentation. Share your expertise and experience with the club. Programs can be on any topic that is ham radio related.

Not sure how to approach talking about a subject? Never used PowerPoint? No problem, I would be happy to help you get your talk ready for the club.

Contact Pat Volkmann, W9JI, at orc_pat_w9ji@outlook.com to discuss your idea for a program.

ORC Meeting Agenda

April 8, 2023

- | | |
|--|--|
| <ol style="list-style-type: none">1. 7:15 – 7:30 PM
Check-In and Introductions2. 7:30 PM Call to Order:
President Bill Greaves (K9GN)3. Announcements, Bragging Rights, Show & Tell, Upcoming Events, etc.4. Mike Harrington, KD9GCN,
Operating a Remote Ham Station5. President’s Update:
Bill Greaves (K9GN) | <ol style="list-style-type: none">6. 1st VP Report:
Jeananne Bargholz (N9VSV)7. Repeater VP Report:
Tom Trethewey (KC9ONY)8. Secretary’s Report:
Ken Boston (W9GA)9. Treasurer’s Report:
Gary Bargholz (N9UUR)10. Committee Reports11. OLD BUSINESS12. NEW BUSINESS13. Adjournment |
|--|--|

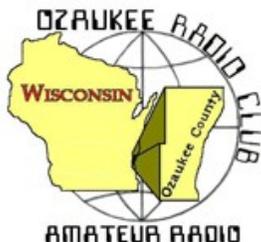


**Next Month's ORC Meeting
Hybrid In-Person/Zoom Meeting
10 May 2023**

**Program:
Bill Shadid W9MXQ & Pat Volkmann W9JI
Video: "Collins: The Lost Decade"
and
a Brief Tour of a huge Collins Collection**

**7:00 PM – Doors Open
7:15-7:30 PM – Zoom Check-In
7:30 PM – Meeting Begins**

The Ozaukee Radio Club presents its 43rd Annual Spring Indoor
Amateur Radio, Electronics & Computer



SWAPFEST



featuring **TOWER ELECTRONICS!**

Saturday, May 6, 2023 – 8 AM to 12 PM (setup begins at 6 AM)

Ascension Columbia St. Mary's Center (Milwaukee Curling Club)
W67N890 Washington Ave., Cedarburg, WI 53012

Talk-in: 146.97 MHz – PL 127.3 Hz

Door Prizes! Free WIFI

Food sold by Cub Scout Pack 586, returning from 2022!

Admission: \$7.00 at the gate

Children 12 and under FREE, with a paid adult admission

6 ft. Tables: \$12.00 in advance, \$15.00 at the door, if available

Use the Order Form below, email, or call Tom Trethewey, KC9ONY at 262-421-6351

Email: swapfest@ozaukeeradioclub.org

More information: <http://www.ozaukeeradioclub.org/> or <http://www.facebook.com/orcwi>

For Advance Tickets and Tables, send check with a **SASE** (Business-Size #10 envelope) to:
Tom Trethewey, KC9ONY- W69N905 Evergreen Ct N, #202, Cedarburg, WI 53012-1170

Name: _____

Call sign: _____

Address: _____

Phone number: _____

Email: _____

No. of Tickets: _____ X \$7 = _____

(Advance tickets are double stub)

No. of Tables: _____ X \$12 = _____

Electricity: Yes (Add \$5) _____ No _____

Total Amount: _____

(Please make checks payable to ORC)