



January 2020
Volume 58, Issue 1
Our 101st Year

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Website:

<http://www.mvara.org/>

The Voice Coil
Newsletter of the
Mahoning Valley Amateur
Radio Association
Established 1919

The Voice Coil

Prez Sez

WOW—it's already 2020. Who ever thought we would be here? Certainly not me. Things aren't quite as scientists promised us, that's for sure. But look at where we are in ham radio--get a DMR radio and IF you can program it you can talk all over the world on an HT.

I talked to a number of the members and I want to talk to all of you. One of the things that we talked about was participation. This club does radio support for several events in the Youngstown area and we can always use help. We want to know what you're interested in doing. What can we do to get you to come out and teach us something? We want to make amateur radio FUN!

We want to try and grow the club by inviting new technicians. Doing more activities with the Boy Scout and Girl Scouts could help interest young people in ham radio. The idea is to bring ham radio to more people.

MVARA needs to be more visible at the events that we do. Possibly we could set up a table at one of the events in Youngstown.

One goal is to start an Education Committee to have classes for licensees at all levels plus classes on other subjects of interest to ham radio operators. We want to help operators grow their skills--and would also like to get some members who can help be mentors.



Mentors can help a new operator show his radio works, how to program it, and what to say when you key the mike.

Most of the club equipment has already been accounted for and there are only a few items we still need to locate. Do we continue storing the club equipment the way we have or do we buy a trailer? If we don't go with the trailer do we buy a bunch of the same color tubs so people know that's club stuff?

Another question remains--do we buy another small generator and what do we do with the big generator?

(Continued pg. 2)

Next Meeting:

January 9, GOP
Headquarters meeting
room, 8381 Market St.,
Boardman, OH
(in Adamas Plaza)

(Note: Food and snacks will no longer be available at the meeting. Pizza available at Bruno Bros.)

2020 Officers

President: Scott Wilton, KE4UHC
Vice President: Wes Boyd,
W8IZC
Secretary: Mike Malarky, W8IWD
Treasurer: Nancy Brett, KD8QNY
Trustees: Dean DeMain, W8YSU
Jerry Goddard, KC8EFO
Mike McCleery, K8PRR
Bryan Bartzi, KF8G

Newsletter Editor: Mark
Haverstock, K8MSH

Awards Manager: Dave Fairbanks,
N8NB, 330.759.6993, 4770 Logan
Ave. Youngstown, OH 44505

The Mahoning Valley Amateur
Radio Association, Inc, meets the
second Thursday of every month.
Location and time are subject to
change. Dues are \$20.00 per year,
\$10.00 each for additional family
member. Contact Nancy,
kd8qny@zoominternet.net for
membership details.

The club call is **W8QLY**;
equipment operated under this call
includes a two meter voice
repeater at 146.745 (-600, 110.9
PL). Club email:
mvara.w8qly@gmail.com

MONDAY NIGHT NET operates
every Monday at 9:00. PM on
146.745 MHz.

SKYWARN NET - First
Wednesday of the month at 8:30
PM on 146.745 MHz as weather
warrants.

ARES NET- First and third
Mondays of each month at 8:30
PM on 146.745 MHz; prior to the
Monday Night Net.

Prez Sez, continued

Let's start the second 100 years of the MVARA by having a whole lot of FUN doing ham radio stuff. We're working on presentations, hands on builds, some really interesting and exciting projects that look fun.

Santa Net



On Wednesday December 18, 2019 The Mahoning Valley Amateur Radio Association in conjunction with Akron Children's Hospital, Boardman Campus participated in the 19th Annual Santa Net.

For those of you that don't know Amateur Radio operators from the MVARA take 2-meter handheld radios into the rooms of the children in the hospital (with the parents' permission) and with the cooperation of the Child Life Department. Nine children got to talk to Santa at the North Pole over amateur radio.

The MVARA members participating were: Dean DeMain W8YSU, Doug Sage KB8TPG, Dave Brett KD8NZF, and Nancy Brett KD8QNY. Toys and gifts were donated by the Salem Home Depot (via Steve KB8VAO) and the MVARA also donated some gifts.

Thank you to all who came out and checked-in to the net.

Dean DeMain
W8YSU

License refresher answers: E5D01 (A), E5D02 (B),
G2A01 (A), G2A02 (B)

Current Activities

January 7: VE Session, Boardman Library. 6:30pm

January 9: Club meeting, 7pm. **DMR 4 U.** For several years, DMR has been the new guy on the block in ham radio. In January, Ray, K8NVY, and Paul, KD8DEL, will be presenting an introduction to DMR.

Ray and Paul are part of a small group in our area that are active in DMR and have helped many get their radios set up to use the area DMR repeaters. They will provide an overview of DMR, show how to use the common DMR software, and pass along tips from their experiences with DMR.

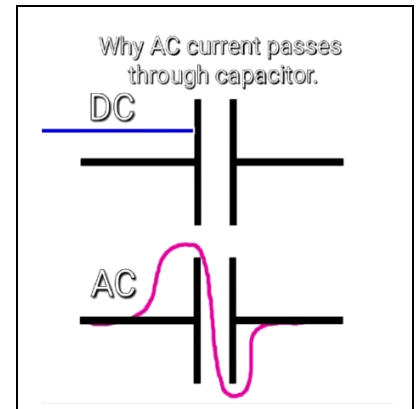
We hope you will join us as we spend an evening learning about DMR.

Contact Us:

Email: mvara.W8OLY@gmail.com

Snail-mail: MVARA, P.O. Box 14141, Poland, OH 44514

Meeting ideas/ suggestions? Contact Dave, KD8NZF,
KD8NZF@zoominternet.net



Hamfest Calendar



01/26/2020 - Tusco Amateur Radio Club's 30th Annual Hamfest, Electronics and Computer Show
Location: Wallick Auction, 965 N. Wooster Avenue, Strasburg, OH **Website:** <http://www.tuscoarc.org>
Talk-In: 146.730 (PL 71.9) **Public Contact:** Janice Green , KB8YDK, 32210 Norris Road Tippecanoe., OH 44699 Phone: 330-340-4424 **Email:** k8wfn@tusco.net

02/16/2020 - Mansfield Mid-Winter Hamfest **Location:** Richland County Fair Grounds, 750 North Home Road, Mansfield , OH 44901. **Website:** <http://WWW.IARC.CLUB> **Talk-In:** 146.940 - (PL 71.9)
Public Contact: Danny Bailey, W8DLB, 70 Euclid Street Shiloh, OH 44878, Phone: 567-763-0021
Email: w8dlb113@gmail.com

03/14, 15/ 2020 - Toledo Hamfest, ARRL Great Lakes Division Convention - Location: Owens Community College - 30335 Oregon Road - Perrysburg, OH 43551 - Website: <http://www.tmrahamradio.org> - Contact: Rob Hall, KV8P - 8751 Oak Valley Road Holland, OH 43528 - Phone: 419-345-5759 - Email: kv8p@kv8p.com

Know of any regional events that should be included in the Voice Coil? Send the information to: MVARAVoiceCoil@gmail.com

CWOPS 10th Anniversary Celebration

The CW Operators Club invites all amateur radio operators to look for us on the air and join our celebration of the CWOPS encouraging the unique art form of morse code for ten years. From January 1, 2010 to January 31, 2020 you can find us 28 Khz up from the bottom of the band calling CQ with /CWO appended to our call signs.

There will be a large number of special event calls on the air. CWOPS and MVARA member, Rich KB8GAE, will be using the special event call sign K8G and hopes to work as many MVARA members as possible.

Stations working 25 or more members will be eligible for a certificate. Special event rules are on our website at <https://cwops.org/cwops-10th-anniversary-celebration/>

Rich KB8GAE



10 Years

2010 - 2020

CW - The Once and Future Mode

By Marshall G. Emm N1FN/VK5FN

Man has been around for something like 25,000 years (depending on who you talk to, and their definition of man). We have documentary records, i.e. recorded history, going back perhaps 6,000 years, again depending on who you talk to. But it is only in the last 150 years that we have been able to communicate with distant people at speeds faster than a runner, or a horseback rider, or someone on a boat. 150 years ago communications beyond line-of-sight traveled at literally a walking pace.

What we think of as communication today was born with the electric telegraph, which in turn depended on Morse code. What Samuel FB Morse and the other pioneers of telegraph could not know was how profound would be the changes resulting from the telegraph. It wasn't just "the birth of communications" but a full-scale revolution in relationships between people who weren't in physical proximity. Warfare, commerce, politics and everyday life were changed dramatically and permanently.

In 1844 the only telegraph line was Morse's demonstration line between Baltimore and Washington, a distance of 40 miles. Six years later, according to the US Census of 1850, there were already *12,000 miles* of telegraph lines in use. By 1900 there were hundreds of thousands of miles of telegraph lines all over the world, connected in true networks that would be familiar to any student of the Internet. There were tens of thousands of professional telegraphers. All of those were gradual evolutions from the original electric telegraph. And at the heart of it all was Morse code.

Just as the original electric telegraph depended on Samuel Morse's code, so did the evolution of radio-communications, and later digital communications. It sounds "clever" to say that Morse was the original digital mode, but it's literally true. Morse uses a simple "binary state" to store and carry information, and that is exactly what all those gigabytes of "ones and zeroes" on your hard disks and DVDs are using.

WB2ITX dares us to embrace the future

By Dan Romanchik, KB6NU

In the January issue of QST, ARRL CEO Howard Michel, WB2ITX, dares us to imagine the future of amateur radio. He points out that the demographics of the ARRL membership does not match the demographics of amateur radio as a whole, and then say, “They are different, and they want different things.”



He then goes on to enumerate some of the steps the ARRL is taking to meet the needs of the future generation of hams, including [starting a new magazine](#) called *On the Air* aimed at new hams and the [Lifelong Learning Program](#).

He then talks about “verticals.” This terminology is kind of unfortunate because he’s not talking about antennas that need radials, but rather special interest groups (SIGs), including “Radiosport, Experimenters, and Emergency Communications.” The ARRL already has contesting and emergency communications departments, and publishes *QEX* magazine for experimenters. I’m not really sure how the “verticals” are going to differ from the ARRL’s current activities in these areas, but it is a good idea to think about how to serve special interest groups. Another SIG that the ARRL might consider is digital communications. I’m sure you all have some ideas about this, too.

What really caught my eye is what he has to say about clubs. He writes:

Another way we play to engage hams is through local clubs. ARRL will be hiring a national club coordinator in 2020, who will be charged with developing new ways for clubs to organize and operate. We will continue to support traditional clubs, clubs that meet monthly for business and social events, organize ARRL Field Day activities, etc. But traditional clubs are not the future of clubs. Young people join causes, not clubs.

Our focus will be on developing ways, and an infrastructure, that members can use to organize themselves in ways they want, to do things that they consider meaningful. I can see these new clubs organized to support special events, such as a marathon; to engage in STEM education; or prepare for disasters. These types of clubs exist now, but they may need to conform to a set of rules designed for traditional clubs. Can we scrap the rules and provide meaningful support? To aid in this, club leadership could be another vertical. ARRL could provide training in soft skills, such as how to run a meeting or give an effective presentation.

I think some of these ideas are spot on. I’ve written many times here about [what the ARRL might do to help clubs](#). I have also served as the Michigan Section Affiliated Club Coordinator and developed and provided [leadership training for club officers](#) here in Michigan.

I’m excited really that WB2ITX realizes how poor the ARRL support for clubs has been and is considering creating the position of a national club coordinator. Heck, I might even apply for the job myself!

J-Numbers

Dave Brett, KD8NZF (alias, Dr. J)

The Extra Class questions from the last *Voice Coil* featured a question on writing impedance using a complex math format. That's probably not something you do every day, but once you think about it you may be surprised how often it does come up. For instance, check the display on this MFJ Antenna Analyzer.



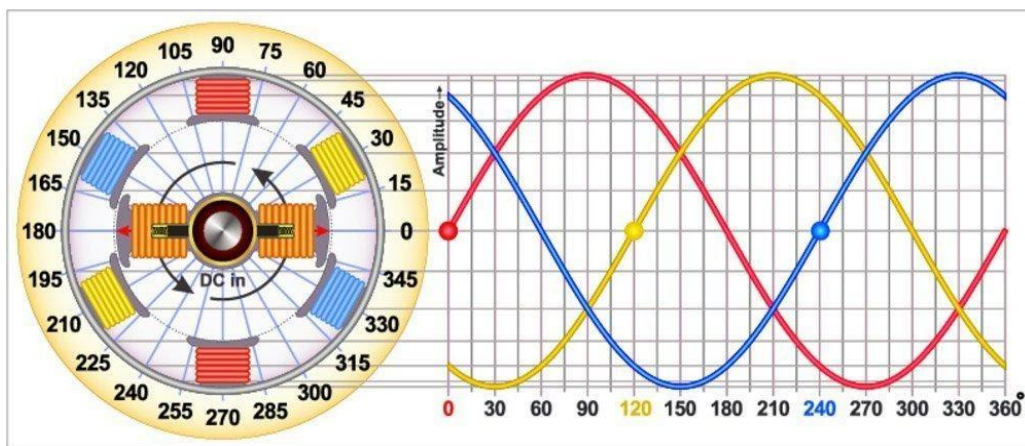
Most of the time we just watch the needles, but if you look at the bottom line of the display it reads R=49 and X=0. This is a complex number – also known as a j-number.

j-numbers come from Imaginary Numbers in math. The idea of an imaginary number recognizes there is no answer for -1 . You know a square root is a number multiplied by itself that equals the number inside the square root symbol. For instance, the square root of four is two because two times itself equals four. But what multiplied by itself equals -1 . The answer is there is no answer. So mathematicians started referring to the answer as imaginary and used the symbol i to represent -1 .

Along comes electronics already using i to represent current, so in electronics we usually use j to represent imaginary numbers. Yikes! This is horrible! But wait, it doesn't get better.

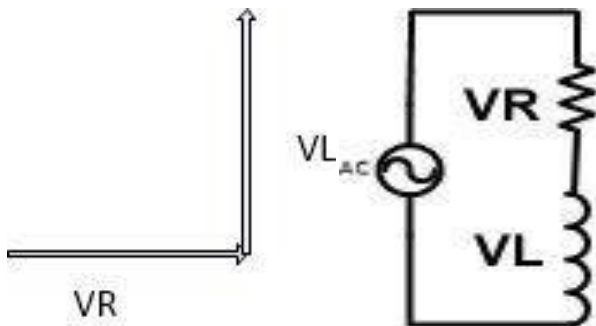
Why would we need imaginary numbers in Amateur Radio? Do we get an imaginary shock if we grab hot and neutral? Not usually. But much of what we do in Amateur Radio does involve AC voltages and currents, such as the signal from your transmitter to your antenna. It turns out j-numbers are a good way to represent values in AC circuits.

Maybe you recall something called a phase angle? The phase angle can be easily pictured if you think about 3-phase electricity. At the generator you have essentially 3 windings equally spaced in a circle. Yep that puts them 120° apart. Each winding creates a signal carried from the generator on a separate line or phase. (In this diagram the three windings appear as pairs of coils wired together.)

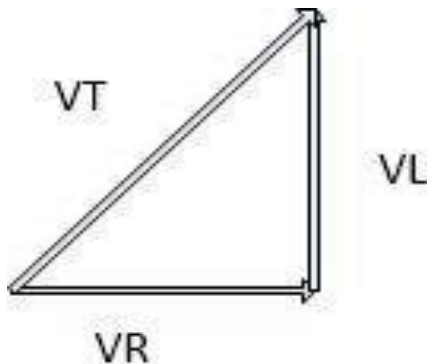


The graph on the right of the diagram represents the sine wave generated from each winding. Because the rotor is spinning past each coil at a different time, each wave is spaced apart from the next. A full wave starts at 0V, climbs to a peak, comes back to 0V, drops to a negative peak, and returns again to zero. Because that wave was generated by a complete revolution of the rotor, we look at the wave as having 360° from start to end of the cycle. Then the positive peak is at 90°, the return to 0 is 180°, the negative peak is 270° and the return to 0 again is 360°. The colored dots on the graph just allow you to see a start point for each wave and emphasize the idea that the phase angle is just a delay in time from the start of one wave to the next.

Uh Oh, we just divided our waves into 90° sections. Turns out that when you pass sine waves through capacitors and inductors, they also get delayed. Wait for it – yeah by 90°. Maybe you remember right triangles have legs at 90°. So it became convenient to use right triangles to represent the voltages and currents going through capacitors and inductors. Let’s use a horizontal line to represent a voltage that has not been phase shifted by 90° and a vertical line for one that has been shifted. We could draw two lines representing the voltage before and after it went through an inductor or capacitor. Let’s stick to inductors and resistors for the moment. Resistors cause no phase shift so we will use the voltage across the resistor as the horizontal line. Inductors cause a +90° phase shift and we will draw the inductor voltage at +90° to the resistor like this:



Of course we can’t stop there because the question always comes up, what is the total voltage in the circuit. Turns out the total voltage is the hypotenuse of a triangle with the two legs we have, so all together it looks like this:

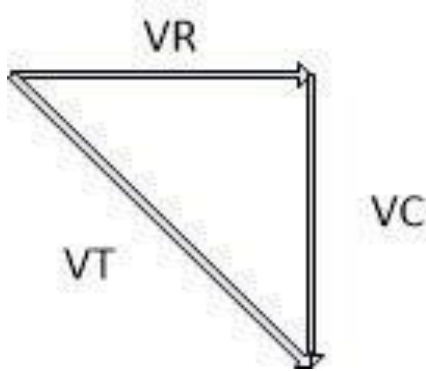


Yeah, yeah, yeah, we’ll get back to j numbers. In electronics we talk about Real numbers referenced to resistors and Imaginary (j) numbers referenced to inductors or caps. This triangle represents the voltages in the R-L circuit above and we can write a j-number for the circuit.

Suppose the voltages are $V_R=1V$ and $V_L=1V$. The equation for the circuit is: $\mathbf{VT=1+j1}$

And it simply says the total voltage is 1V from the resistor and 1V from the inductor. What if $V_R=1V$ and $V_L=2V$? The equation is now $\mathbf{VT=1+j2}$

What if the circuit had a capacitor instead of inductor? Capacitors phase shift by -90° , so for the original numbers the triangle and equation would look like this:



$$\mathbf{VT=1-j1}$$

There is a similar triangle to represent values of X_L , X_C , and Z and similar equations. The equation $\mathbf{Z=49+j0}$ tells us the circuit impedance is 49Ω of resistance and 0Ω of X_L . Did you figure out it was inductance because of the + sign? This is the number from the antenna analyzer at the beginning and it says the antenna has 49Ω of resistance and no reactance. MFJ does not put a sign on the reactance part in their analyzers, so we don't really know if it is inductive or capacitive, just there is reactance if the number is greater than 0.

Did you notice the SWR on the analyzer was showing as 1.0? A perfect antenna would have no reactance and 50Ω of resistance. This one is showing 49Ω which is pretty close to 50, so it's showing a perfect antenna. Since its unlikely you will ever run into a perfect match, the analyzer must be hooked up to a dummy load.

OK, so what? Well suppose the analyzer was showing $R=40$ and $X=75$. The j number would be $\mathbf{Z=40+j75}$. That says the antenna has 40Ω of resistance and 75Ω of reactance. A perfect antenna will have no reactance, so we add capacitance or inductance to cancel the $X=75\Omega$. That's what an antenna tuner does for us.

We have avoided solving the j-numbers so far because this discussion was already freaky. But just to be complete, the equation is solved with Pythagoras Theorem: $\mathbf{Z=40^2+75^2=85\Omega}$

Z is what is displayed on the MFJ's right hand meter face.

We have also avoided relating the SWR directly to the impedance value. Generally speaking, the SWR is the ratio of load and source impedance, but there are a few gotcha's on that. For the Z of 85Ω above and assuming a 50Ω system, you could estimate the SWR as $SWR=85/50=1.7$ but the meter will probably show higher for several reasons.

First is MFJ uses a directional coupler to provide forward calculation for SWR from impedance is only accurate if there is no reactance. So a 40Ω antenna with no reactance and a 50Ω transmitter with no

reactance should give a SWR of about 1.3. If there is reactance you need to compare the reflected and incident voltages or calculate using the Reflection Coefficient, but that's a can of worms for another day.

If you want to dig deeper into SWR there is an interesting article from ARRL here:
<https://www.arrl.org/files/file/Technology/tis/info/pdf/q1106037.pdf>

HAM HUMOR: NEW HAM EXCITED TO START PLANNING FOR EXPENSES OF HIS NEW HOBBY



GIBBSTOWN, OREGON – The tri-county area has several new amateur radio operators, thanks to a recent ham radio license exam session.

One of the newly minted “hams” is Myron Tidwell.

“I’ve already started a multi-tabbed spreadsheet to track what I’ll need to spend to start my new hobby!” Tidwell said.

“The main tab lists the radio gear I’ll need, another has furniture need for my shack, another outlines the costs of QSL cards and allocations for a postage increase every two years.”

He is already planning to share the spreadsheet in a presentation at an upcoming ham radio club meeting.

“They’re gonna love the pivot tables that total everything up! And, wow, they will really be impressed with the dollar amount. It’s big!” he said.

By [K5KVN](#), on the scene

Amateur License Refresher

Dave, KD8NZF



It's probably been awhile since you took your Amateur License exam. Here are a few sample questions from the current question pools just to keep those synapses firing.

Extra Pool

E5D01 (A)

What is the result of skin effect?

- A. As frequency increases, RF current flows in a thinner layer of the conductor, closer to the surface
- B. As frequency decreases, RF current flows in a thinner layer of the conductor, closer to the surface
- C. Thermal effects on the surface of the conductor increase the impedance
- D. Thermal effects on the surface of the conductor decrease the impedance

E5D02 (B)

Why is it important to keep lead lengths short for components used in circuits for VHF and above?

- A. To increase the thermal time constant
- B. To avoid unwanted inductive reactance
- C. To maintain component lifetime
- D. All of these choices are correct

General Pool

G2A01 (A)

Which sideband is most commonly used for voice communications on frequencies of 14 MHz or higher?

- A. Upper sideband
- B. Lower sideband
- C. Vestigial sideband
- D. Double sideband

G2A02 (B)

Which of the following modes is most commonly used for voice communications on the 160-meter, 75-meter, and 40-meter bands?

- A. Upper sideband
- B. Lower sideband
- C. Vestigial sideband
- D. Double sideband

Answers pg. 2

Dues are Due!! MVARA 2020 Membership

Date _____

Name _____ Call _____

Spouse/Family _____ Call _____

Street Address _____

City _____ State _____ Zip _____

Home Phone _____ Cell Phone _____

Email _____

(This is the email where your *Voice Coil*, the club newsletter, will be sent)

ARRL member? Yes, expiration month & year _____ No

Do you want the following to be included in the membership list available to all members?

- | | | |
|---------------|------------------------------|-----------------------------|
| Name and Call | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Address | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Phone | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Email Address | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Membership

Renewal New Member Individual membership \$20 \$ _____

Renewal New Member Family members, \$10 each \$ _____

W8QLY Repeater Support

\$12 Basic Support Donation \$ _____

\$50 Gold Level Donation \$ _____

\$ _____ Other \$ _____

Total Enclosed \$ _____

Make checks payable to: Mahoning Valley Amateur Radio Association. Please bring this form and your payment to the next meeting or mail to: MVARA, P.O. Box 14141, 125 West McKinley Way, Youngstown, Ohio 44514

Contest and Special Event Operating Information

Dave Fairbanks N8NB

Data below as well as more information courtesy of the following website:

<http://www.hornucopia.com/contestcal/index.html>.

January 2020

+ AGB New Year Snowball Contest	0000Z-0100Z, Jan 1
+ QRP Fox Hunt	0200Z-0330Z, Jan 1
+ Phone Fray	0230Z-0300Z, Jan 1
+ SARTG New Year RTTY Contest	0800Z-1100Z, Jan 1
+ AGCW Happy New Year Contest	0900Z-1200Z, Jan 1
+ CWops Mini-CWT Test	1300Z-1400Z, Jan 1 and 1900Z-2000Z, Jan 1 and 0300Z-0400Z, Jan 2
+ AGCW VHF/UHF Contest	1400Z-1700Z, Jan 1 (144) and 1700Z-1800Z, Jan 1 (432)
+ QRP ARCI New Years Sprint	1500Z-1800Z, Jan 1
+ UKEICC 80m Contest	2000Z-2100Z, Jan 1
+ NRAU 10m Activity Contest	1800Z-1900Z, Jan 2 (CW) and 1900Z-2000Z, Jan 2 (SSB) and 2000Z-2100Z, Jan 2 (FM) and 2100Z-2200Z, Jan 2 (Dig)
+ SKCC Sprint Europe	2000Z-2200Z, Jan 2
+ NCCC RTTY Sprint	0145Z-0215Z, Jan 3
+ QRP Fox Hunt	0200Z-0330Z, Jan 3
+ NCCC Sprint	0230Z-0300Z, Jan 3
+ PODXS 070 Club PSKFest	0000Z-2400Z, Jan 4
+ WW PMC Contest	1200Z, Jan 4 to 1200Z, Jan 5
+ RSGB AFS Contest, CW	1300Z-1700Z, Jan 4
+ ARRL RTTY Roundup	1800Z, Jan 4 to 2400Z, Jan 5
+ ARRL Kids Day	1800Z-2359Z, Jan 4
+ EUCW 160m Contest	2000Z-2300Z, Jan 4 and 0400Z-0700Z, Jan 5
+ IQRP Quarterly Marathon	0800Z, Jan 6 to 2000Z, Jan 12
+ ARS Spartan Sprint	0200Z-0400Z, Jan 7
+ QRP Fox Hunt	0200Z-0330Z, Jan 8
+ Phone Fray	0230Z-0300Z, Jan 8
+ CWops Mini-CWT Test	1300Z-1400Z, Jan 8 and 1900Z-2000Z, Jan 8 and 0300Z-0400Z, Jan 9
+ AWA Linc Cundall Memorial CW Contest	2300Z, Jan 8 to 2300Z, Jan 9 and 2300Z, Jan 11 to 2300Z, Jan 12
+ NCCC RTTY Sprint	0145Z-0215Z, Jan 10
+ QRP Fox Hunt	0200Z-0330Z, Jan 10
+ NCCC Sprint	0230Z-0300Z, Jan 10
+ YB DX Contest	0000Z-2359Z, Jan 11
+ Old New Year Contest	0500Z-0900Z, Jan 11
+ UBA PSK63 Prefix Contest	1200Z, Jan 11 to 1200Z, Jan 12
+ SKCC Weekend Sprintathon	1200Z, Jan 11 to 2400Z, Jan 12
+ North American QSO Party, CW	1800Z, Jan 11 to 0559Z, Jan 12
+ NRAU-Baltic Contest, SSB	0630Z-0830Z, Jan 12
+ NRAU-Baltic Contest, CW	0900Z-1100Z, Jan 12
+ DARC 10-Meter Contest	0900Z-1059Z, Jan 12

+ Midwinter Contest	1000Z-1400Z, Jan 12
+ RSGB AFS Contest, Data	1300Z-1700Z, Jan 12
+ Classic Exchange, CW	1400Z, Jan 12 to 0800Z, Jan 13 and 1400Z, Jan 13 to 0800Z, Jan 15
+ 4 States QRP Group Second Sunday Sprint	0100Z-0300Z, Jan 13
+ QRP Fox Hunt	0200Z-0330Z, Jan 15
+ Phone Fray	0230Z-0300Z, Jan 15
+ CWops Mini-CWT Test	1300Z-1400Z, Jan 15 and 1900Z-2000Z, Jan 15 and 0300Z-0400Z, Jan 16
+ NAQCC CW Sprint	0130Z-0330Z, Jan 16
+ NCCC RTTY Sprint	0145Z-0215Z, Jan 17
+ QRP Fox Hunt	0200Z-0330Z, Jan 17
+ NCCC Sprint	0230Z-0300Z, Jan 17
+ LZ Open Contest	1800Z-2200Z, Jan 17
+ Hungarian DX Contest	1200Z, Jan 18 to 1159Z, Jan 19
+ RSGB AFS Contest, SSB	1300Z-1700Z, Jan 18
+ North American QSO Party, SSB	1800Z, Jan 18 to 0559Z, Jan 19
+ NA Collegiate Championship, SSB	1800Z, Jan 18 to 0559Z, Jan 19
+ ARRL January VHF Contest	1900Z, Jan 18 to 0359Z, Jan 20
+ WAB 1.8 MHz Phone/CW	1900Z-2300Z, Jan 18
+ Feld Hell Sprint	2000Z-2359Z, Jan 18 (EU-AF) and 2300Z, Jan 18 to 0259Z, Jan 19 (ENA-ESA) and 0200Z-0559Z, Jan 19 (WNA-OC-AS)
+ Run for the Bacon QRP Contest	0200Z-0400Z, Jan 20
+ SKCC Sprint	0000Z-0200Z, Jan 22
+ QRP Fox Hunt	0200Z-0330Z, Jan 22
+ Phone Fray	0230Z-0300Z, Jan 22
+ CWops Mini-CWT Test	1300Z-1400Z, Jan 22 and 1900Z-2000Z, Jan 22 and 0300Z-0400Z, Jan 23
+ NAQCC CW Sprint	0130Z-0330Z, Jan 23
+ NCCC RTTY Sprint	0145Z-0215Z, Jan 24
+ QRP Fox Hunt	0200Z-0330Z, Jan 24
+ NCCC Sprint	0230Z-0300Z, Jan 24
+ CQ 160-Meter Contest, CW	2200Z, Jan 24 to 2200Z, Jan 26
+ REF Contest, CW	0600Z, Jan 25 to 1800Z, Jan 26
+ BARTG RTTY Sprint	1200Z, Jan 25 to 1200Z, Jan 26
+ UBA DX Contest, SSB	1300Z, Jan 25 to 1300Z, Jan 26
+ Winter Field Day	1900Z, Jan 25 to 1900Z, Jan 26
+ QCX Challenge	1300Z-1400Z, Jan 27 and 1900Z-2000Z, Jan 27 and 0300Z-0400Z, Jan 28
+ QRP Fox Hunt	0200Z-0330Z, Jan 29
+ Phone Fray	0230Z-0300Z, Jan 29
+ CWops Mini-CWT Test	1300Z-1400Z, Jan 29 and 1900Z-2000Z, Jan 29 and 0300Z-0400Z, Jan 30
+ UKEICC 80m Contest	2000Z-2100Z, Jan 29
+ NCCC RTTY Sprint	0145Z-0215Z, Jan 31
+ QRP Fox Hunt	0200Z-0330Z, Jan 31
+ NCCC Sprint	0230Z-0300Z, Jan 31

DX Operating Information

Dave Fairbanks N8NB

Credit for the below information and further information on these operations and others can be found at the following website: <http://www.ng3k.com>

January							
2020 Jan02	2020 Jan07	Cyprus SBA	ZC4UW	LoTW	DXW.Net 20191011	By G3ZAY M0BLF M0VFC G7VJR M0ZXA G7SOZ M0WUT M0BBB; 160-10m; CW SSB; 400w; verticals; 4 stations; QSL via Club Log OQRS	
2020 Jan03	2020 Jan23	Maldives	8Q7BS <small>NEW</small>	RX3AMY	OPDX 20191223	By RX3AMY fm Mahibadhoo	
2020 Jan05	2020 Jan11	St Lucia	J6	AI6LY	DXNews 20191214	By AI6LY as J6/AI6LY fm IOTA NA-108; HF; SSB + digital	
2020 Jan05	2020 Jan11	St Kitts & Nevis	V4	LoTW	TDDX 20191213	By WB4M as V4/WB4M; HF; all modes; QSL also OK via WB4M direct	
2020 Jan06	2020 Jan12	Palestine	E44RU	LoTW	DXW.Net 20191130	By R7AL RA1ZZ RW9JZ R5EC fm nr Jericho (KM71fm); 160-10m; CW SSB FT8 (f/h); QSL also OK via R7AL (B/d)	
2020 Jan07	2020 Jan13	Palau	T88AQ	LoTW	TDDX 20191112	By JH6WDG; 160-10m; CW SSB FT8; 1kw; yagis, dipoles; QSL also OK via JH6WDG, logs uploaded to Club Log	
2020 Jan09	2020 Jan14	Bermuda	VP9	LoTW	TDDX 20191206	By WB9EAO as WB9EAO/VP9 fm Hamilton; @VP9GE; 160-10m; CW SSB; 100w; QSL also OK via WB9EAO direct	
2020 Jan09	2020 Jan15	Montserrat	VP2MDT	WV2B	WV2B 20190917	By WV2B; SSB CW; holiday style operation	
2020 Jan11	2020 Jan19	Cayman Is	ZF2PG	LoTW	TDDX 20191001	By K8PGJ; @ZF1A; 160-40m outside NAQP; SSB; 100w; QRV for NAQP SSB; QSL also OK via ZF2PG	
2020 Jan12	2020 Jan31	Norfolk I	VK9NK	SP9FIH	SP9FIH 20190626	By SP9FIH; 160-10m; CW SSB RTTY; operation to continue until Apr 12	
2020 Jan15	2020 Jan23	Palau	T8	Home Call	DXW.Net 20191203	By JI3DNN as T88CZ, JH3LSS as T88DK, JA3HJI as T88DN, JA3IVU as T88ED, JA3ARJ as T88EF, JA3AVO as T88MB; 160-10m; all modes	
2020 Jan20	2020 Feb09	Cocos I	TI9	LoTW	TDDX 20190917	By XE1B HK5OKY fm IOTA NA-012; 160-6m; SSB; 2 stations; 700w; QSL also OK via Club Log OQRS; no Buro cards	
CQ 160m Contest, CW (Jan 24-26, 2020) Check here for pericontest activity too.							
2020 Jan28	2020 Feb07	Gambia	C5XW	G5XW	DXW.Net 20191209	By G5XW; 40-17m; holiday style operation	
2020 Jan30	2020 Feb13	El Salvador	HU1DL	LoTW	DXW.Net 20191027	By DH8WR DJ6TF DJ9KH DL1KWK DL2HWA DL2RNS DL4SVA DL7JOM DL7VEE DL9GFB; 160-17m, incl 60m; CW SSB RTTY FT8; 3 stations, each 1kw, QRV 24/7; QSL via Club Log OQRS	

Station Loaner Program

If you're a new ham/newly upgraded and want to get on the HF bands, MVARA has a loaner program for club members. The club has two complete stations with radio, power supply, microphone, CW key, and antenna tuner. All you need to do is supply your own coax, antenna, and keep the equipment in good condition while you have it.

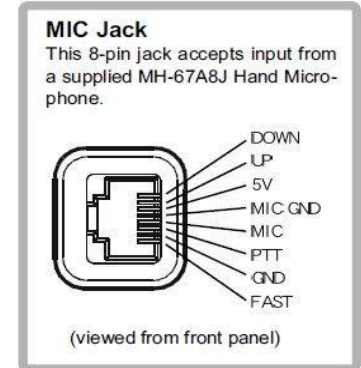
Loan period is up to 6 months. However, you will be responsible for returning the station temporarily for use during Field Day weekend in June.

With the new ARRL proposal, it looks like even Tech class amateurs may soon have more phone privileges on some of the HF bands. Contact MVARA at our email address: mvara.W8QLY@gmail.com

Electret Microphones

I recently picked up a used Aviation style headset and needed to change connectors to work with my Yaesu radios. Doesn't sound like that should be too difficult and proceeded to change the plugs. Before connecting to the radio, I checked the connections by putting a tone on the headphone part and measuring the output of the microphone. Headphones sound fine, but nothing out of the mic! Checked over the connections, everything looks ok, still nothing out. Ohmed out the connections, they all check ok, still nothing out. Hmmm, maybe I need to pay more attention to what I'm doing? Nah, that's no fun.

Internet to the rescue! Found schematics for the headset. Looks like about what you would expect, electret mic element, stereo/mono switch, volume control for headphones, and so on. Oops, wait, electret mic element. I can't test the mic unless I provide DC power to the element. I also need to know what voltage the radio will provide, then can lash up a test circuit to supply DC through a resistor to the mic + leg. Alright let's check the manual for the FT450. Great, there is a 5V line at the connector. Run 5V through a resistor and voila, the mic audio shows up.



But wait, how is that 5V going to get to the mic when I plug it into the radio, and where is the series resistor needed by the mic element? Ok, a check of the radio schematic reveals there is no series resistor to the mic connector and a check of the mic schematic shows its not in the headset either. Uh-Oh. Well I wonder what Heil does on their headsets – rescue #2. Heil has a fair amount of reference info on their website and part of that is the wiring to use a Heil ICOM headset on a Yaesu radio: <https://heilsound.com/heil-amateur-radio/support/dsp-settings/all-things-yaesu/>

That's odd—I wonder why you need an adapter to use an IC headset on a Yaesu radio. Oh look, it makes the connections from an electret mic to a Yaesu mic connector. Yes, this one shows a round mic connector and the FT450 has a RJ-45 connector, but the connections are the same. To adapt the electret to the Yaesu, you connect the 5V line through a 4.7KΩ resistor and .47μF cap. What's up with the cap?

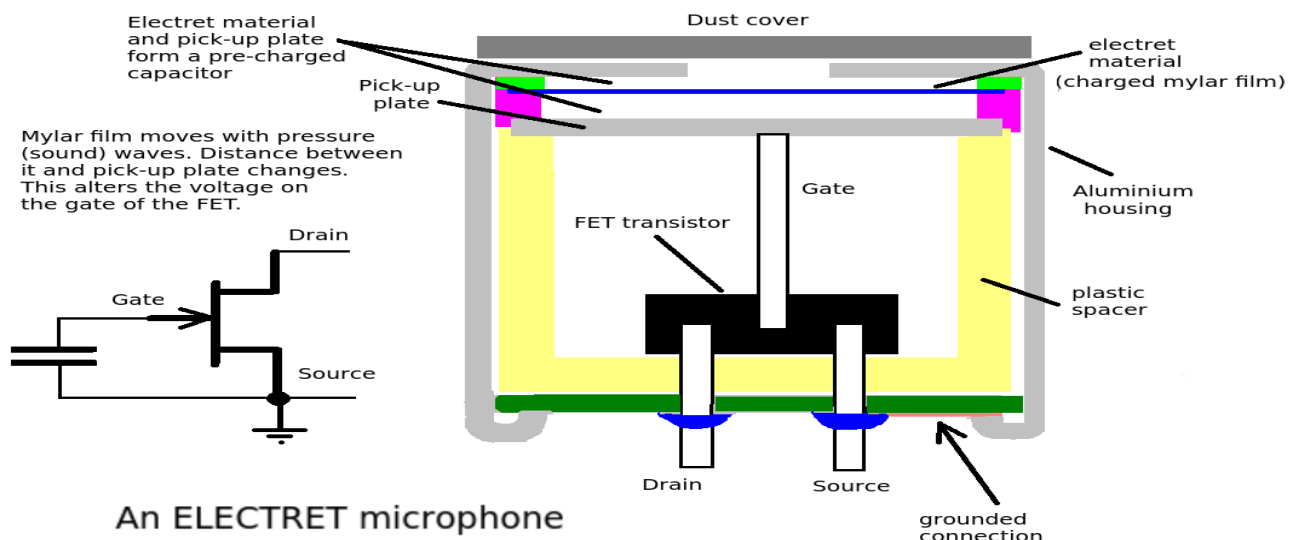
Time to get back on the internet. The short version is:

- Kenwood and Yaesu use dynamic mic elements and Icom uses an electret.
- You need to supply DC to an electret, but you need to keep the DC current low, so you run it through the resistor.
- You don't want the DC to travel back down the mic cable to the Mic Audio In pin on the mic connector, so you need to block the DC from getting to that pin.
- Caps block DC and pass AC.
- Checking the schematic, the + output of the mic, travels through the cap to the Mic pin on the connect, so the audio (AC) gets through, but the DC is blocked.

Heil will sell you a nice shiny adaptor – easy peasy. But quoting Tina Turner, “We never ever do anything nice and easy.” To the right is my version of the adaptor. The connections are in the blue part in the middle. It is a piece of PEX tubing from the hardware store. On the left is the cable and RJ-45 connector, salvaged from an old network cable. On the right are ¼” and ⅛” female connectors. (Yes, Andy, I bought them at Armie's) The ¼” gold connector is to plug in a PTT footswitch. The ⅛” black connector is to plug in the mic connector. The headphone connector from the headset connects straight to the radio.



(Editor's note: For those who are curious about what's inside an electret mic, here's the scoop. See below.)



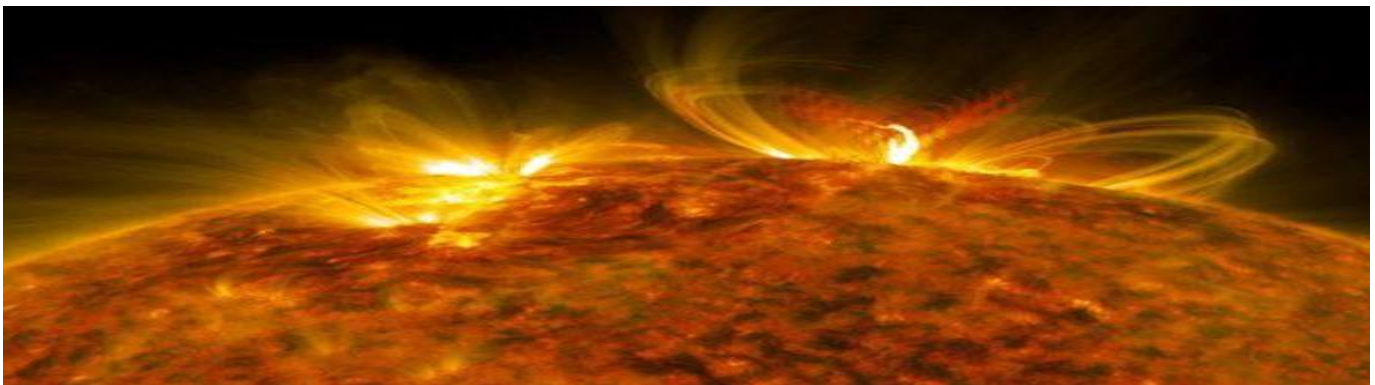
Got Pictures/Video?



If you didn't get to participate when the MVARA joined the Boy Scouts to celebrate the 100 year anniversary of Camp Stambaugh, be sure and check out the audio visual presentation of the on our home page at www.mvara.org You'll feel like you were part of the festivities.

The MVARA can use your pictures and videos of club activities. We would love to have pictures and or video of JOTA, the Christmas Parade, Santa Net, etc. You can submit an edited video file to us or we can put together and edit your raw files. Email your pictures to MVARAVoiceCoil@gmail.com. Video files will be too large to email, so contact Dave kd8nzf@zoominternet.net or Rich kb8gae@yahoo.com to make file transfer arrangements.

Burning Questions: Sunspots



The following is from the National Oceanic and Atmospheric Administration (NOAA) Space Weather Prediction Center (SWPC) website.

“The NOAA/NASA co-chaired, international panel to forecast Solar Cycle 25 released their latest forecast for Solar Cycle 25. The forecast consensus: a peak in July, 2025 (+/- 8 months), with a smoothed sunspot number (SSN) of 115. The panel agreed that Cycle 25 will be average in intensity and similar to Cycle 24.”

“Additionally, the panel concurred that the solar minimum between Cycles 24 and 25 will occur in April, 2020 (+/- 6 months). If the solar minimum prediction is correct, this would make Solar Cycle 24 the 7th longest on record (11.4 years).”

THE LAST WORD

"If your actions inspire others to dream more, learn more, do more and become more, you are a leader." **-John Quincy Adams**



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The ***VOICE COIL*** is the monthly publication of the Mahoning Valley Amateur Radio Association, Inc. (MVARA) and is intended to present news, issues and opinions of interest to MVARA members and the Amateur Radio Community. We encourage contributions of articles, letters to the editor, etc. and welcome newsletter exchanges with other clubs from around the country and around the world. Permission is granted to reprint material contained herein as long as proper credit is given to this newsletter and the author. Ideas for and contributions to the VOICE COIL should be submitted to:

MVARAVoiceCoil@gmail.com

Submissions must be received **no later than the 24th** of the month prior to the month of issue, unless otherwise specified. **Submissions should be in MS Word format or ASCII text—no PDF, please!** Material received after the deadline will be used in the next month's VOICE COIL if it is still current and /or newsworthy.

Swap and Shop Policies

Swap and Shop listings are open to all licensed Mahoning Valley Hams, based on space available—you don't need to be an MVARA member. Please submit your list to mvara.w8qly@gmail.com **AND** mvaravoiccoil@gmail.com for placement in both *Voice Coil* and website. MVARA assumes no responsibility for transactions made or inaccuracies in ads. You are responsible for checking your ad and notifying us of any corrections. Ads will run for two consecutive issues unless notified otherwise.

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