



Mahoning Valley Amateur Radio Association

# Mahoning Valley Amateur Radio Association Voice Coil



February 2025

[mvara.w8qly@gmail.com](mailto:mvara.w8qly@gmail.com)

The Voice Coil - Volume 25-2

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## President's Corner

**Ham radio to the rescue. An interesting article on the ARRL website tells of ham radio operators doing a couple of things. They have been asked to help with the wildfires in the LA area. Ham radio operators are stationed in the parks and around trail heads and reporting to the fire services on conditions at each location. Another ham radio operator is looking at a steep fine from the FCC for \$32,000. He got the fine for operating on government frequencies by telling the plane pilots where to drop water and or fire suppressant. The FCC has really laid down the law this time. He tried to get the fine reduced, but the FCC held tough and will not reduce the fine. Just a couple of examples of when hams can help or hinder an operation.**

## Upcoming MVARA Events

Date	Event	Location
February 13, 2025	MVARA Meeting	Boardman

## February Club Program

At our January meeting we will have a Virtual Visit with Patrick Bolan, KJ7ZSU. Patrick is the “Head Wrangler” at Geochron, the maker of the Geochron World Clock.

Geochron describes their history and future like this:

### **Since 1964 ...**

*... and before the internet, the Geochron World Clock was the only way to see the Sunrise and Sunset on Earth in real-time, in sync with the Earth's 23.4 degree axial tilt against the Sun. President Reagan presented as a gift to Mikhail Gorbachev as an example of American Engineering, and these photogenic world clocks have appeared in motion pictures like the The Hunt for Red October.*

*Over 30,000 mechanical Geochrons have been built over the years. From our shop in Colorado Springs, CO., we alone continue to build and restore these mechanical masterpieces for fine homes and businesses worldwide with enhanced features that were unavailable before 2015.*

*Today, the Geochron Digital 4k takes the terrestrial beauty of our mechanical clocks into the digital realm in glittering 4k resolution. The digital Geochron is unconstrained by physical gears and assemblies, so it's much more affordable... constantly evolving with more mapsets, layers, and live data than ever before.*

Mark your calendar for February 13<sup>th</sup> and join us to meet Patrick and hear the story of the Geochron.



## MVARA 2025 Renewals Are Open

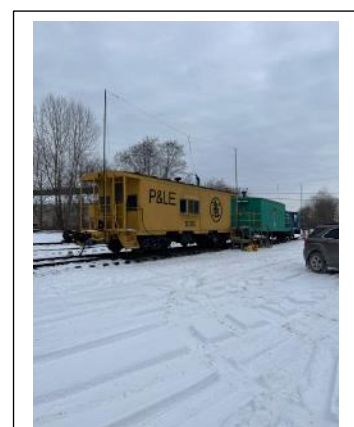
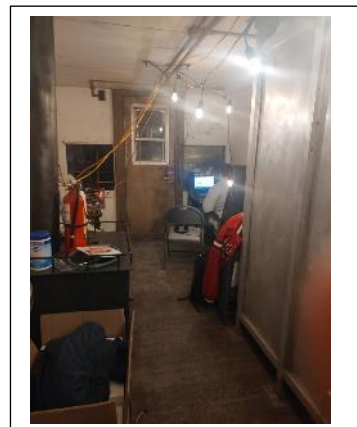
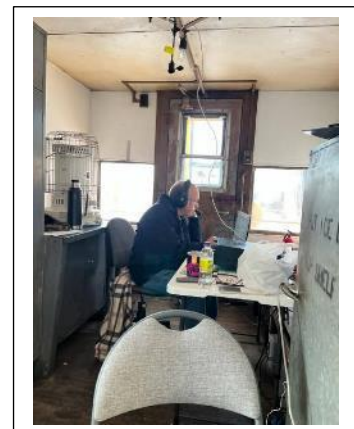
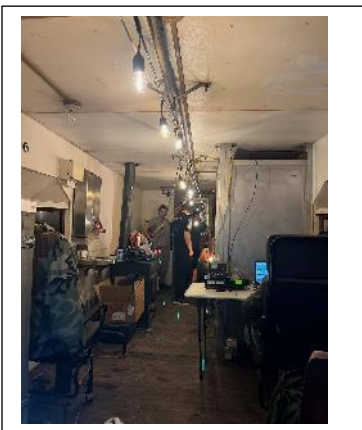
Yep, it's time to renew your membership with MVARA. You can renew in person at the January meeting or online with PayPal. A fillable PDF is on the website here with details:

<https://www.mvara.org/mbrshpfrm/2025%20Membership%20Form.pdf>

## Winter Field Day

A group of hearty (insane?) MVARA members got together to work Winter Field Day 2025 at the Marter Train Yard on Poland Ave in Youngstown. Thanks to Mike K8PRR for posting photos on the club's Facebook page.

Maybe we can talk them into filling us in at the next meeting?



# Ham Radio Tech: Understanding PEP, ICAS, CCS & Duty Cycle

Mark Haverstock, K8MSH

Next time you browse a ham radio catalog, compare the relative power ratings of some of the accessories. I was interested in replacing some antenna switches, and here's what I found listed under the product specs:

- Alpha Delta 4B Coax Switch: 1,500W PEP/1,500 CW
- DX Engineering RR8B-HP Remote Antenna Switch: 7kW ICAS all modes, under 2:1 SWR, 5kW CCS all modes, under 2:1 SWR
- Hamplus Desktop Antenna Switch AS-603A: 2000W power handling at SWR of 1.5:1 or less

PEP (Peak Envelope Power) is often the default rating for switches, antennas, baluns, amplifiers, and other ham radio accessories. But you'll notice others on the list above, like ICAS (Intermittent Commercial and Amateur Service) or just watts (W).

What do these mean to you and station operation?

## Explaining Duty Cycle

Before we tackle the alphabet soup of power ratings, understand they're only part of the picture.

To understand power ratings, you also need to consider the duty cycle—the time your radio or amp delivers power. Each mode has its own duty cycle, expressed in percent. For example, a 100% duty cycle continuously delivers power.

Typical Duty Cycle Percentages

<b>Mode</b>	<b>Duty Cycle</b>
SSB	10 – 20%*
CW	50%
FM/AM	100%
Digital/RTTY	Up to 100%

\* *Duty cycle varies with compression/ALC/mic gain settings.*

The higher the duty cycle, the more potential for stress on your finals. That's why radio manufacturers recommend 25W AM, for example.

The popular FT8 digital mode doesn't require a lot of power—many users find 20 to 30W sufficient to make contacts and only increase power as needed to make the QSO.

## Peak Envelope Power (PEP)

PEP is used when output power varies, which is typical for modes like SSB. It's the highest envelope power supplied to the antenna by a transmitter during any full RF cycle or series of complete radio frequency cycles.

A transmitter delivering 100W PEP can momentarily produce 100W power. Similarly, coaxial switches or other radio accessories rated for 100W PEP power can momentarily handle that amount of power.

We usually associate PEP with SSB transmissions, but it can also describe other modes. For a CW signal, PEP is measured during the key-down period when the transmitter is on.

PEP is equal to the steady carrier power in a CW transmission. PEP is also equal to the average power in a steady FM, FSK, or RTTY signal.

## Let's not forget AM

Assuming a linear, perfectly symmetrical, 100% modulation of a carrier, PEP output of an AM transmitter is four times its carrier PEP. A typical 100W amateur transceiver is rated for no more than 25W of carrier output when operating in AM mode.

## Continuous/Intermittent Commercial Service (CCS & ICAS)

Other ratings include CCS and ICAS. CCS stands for Continuous Commercial Service. This rating means the amplifier can put out its rated power nonstop, 24 hours a day, 7 days a week. That would equate to a 100% duty cycle. TV and radio broadcast stations look for these ratings when choosing transmitters.

Generally, amateur HF radio transmitter power ratings are defined as ICAS (Intermittent Commercial and Amateur Service). Intermittent operation implies that no operating period exceeds five minutes and is followed by a standby period of at least five minutes (or longer when tubes are used). In a solid-state environment, ICAS adjusts the rating to keep the device junction and case temperatures within their maximum ratings while also incorporating operating/standby periods.

ICAS appears to leave some room for interpretation by manufacturers. The following is found in the Palstar LA-1K Amplifier manual:

*"The power output of the LA-1K is 1,000 Watts PEP CW ICAS. Intermittent operation of the LA-1K implies that no operating or ON period of 1000W of Continuous Carrier Power will exceed approximately 1(ONE) minute. On Single Side Band (SSB) voice duty there is no limit on transmit time at full power of 1000W PEP."*

Two ratings—one amp? You can rag-chew as long as you want (PEP rating) but watch it with RTTY and digital (ICAS).

## Does Your Meter Measure Up?

An oscilloscope can be one of the best ways to measure RF power in your shack because you can see the waveform directly on the screen. However, most people don't own one.

Many of us do own ham-grade add-on meters. They are good indicators of whether things are working normally and will give a ballpark reading, but don't expect perfection. Generally speaking, most of these meters are rated at 10% full-scale accuracy. At full deflection (200 or 300W, for example), they will read within 10% of the actual output.

For those who want to read more than watts, the following provide average/peak readings and reasonably high accuracy (\$250+): Palstar PM2000AM, Elecraft W2, Ameritron AWM-30B, and the Monitor Sensors Power and SWR Meter.

Your transceiver or amp may also have a built-in power meter. Depending on the display size, it may be an easy or difficult read. Accuracy can also vary among models and brands. I'm familiar with the Icom IC-7300 meters, and they appear to be close to the readings on my external meter.

Whatever you use, connect your radio or radio/external meter to a 50-ohm dummy load rated at least 100W—not the antenna—to get the most accurate reading. That way, you'll avoid the effect of reflected power and other antenna system anomalies.

### **Are you looking for that 100W promised by the manufacturer?**

The easiest way is to choose one of the modes with a 100% duty cycle—my go-to is RTTY—and briefly crank the power output to 100W. Be sure your radio is connected to a 50-ohm dummy load as described in the above paragraph. Allow some leeway for meter accuracy.

(Originally appeared in DX Engineering's *On All Bands*, October 9, 2024.)

## **Amateur License Refresher**

It's probably been a while 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

E1F01

On what frequencies are spread spectrum transmissions permitted?

- A. Only on amateur frequencies above 50 MHz
- B. Only on amateur frequencies above 222 MHz
- C. Only on amateur frequencies above 420 MHz
- D. Only on amateur frequencies above 144 MHz

E1F02

What privileges are authorized in the US to persons holding an amateur service license granted by the government of Canada?

- A. None, they must obtain a US license
- B. Full privileges of the General class license on the 80-, 40-, 20-, 15-, and 10-meter bands
- C. The operating terms and conditions of the Canadian amateur service license, not to exceed US Amateur Extra class license privileges
- D. Full privileges, up to and including those of the Amateur Extra class license, on the 80-, 40-, 20-, 15-, and 10-meter bands

## General Pool

G4E01

What is the purpose of a capacitance hat on a mobile antenna?

- A. To increase the power handling capacity of a whip antenna
- B. To reduce radiation resistance
- C. To electrically lengthen a physically short antenna
- D. To lower the radiation angle

G4E02

What is the purpose of a corona ball on an HF mobile antenna?

- A. To narrow the operating bandwidth of the antenna
- B. To increase the "Q" of the antenna
- C. To reduce the chance of damage if the antenna should strike an object
- D. To reduce RF voltage discharge from the tip of the antenna while transmitting

E1F01 (B)
E1F02 (C)
G4E01 (C)
G4E02 (D)

## Meet Our New Members

We recently started this section to introduce our new members and it has been well received, so we will continue it in each edition of the Voice Coil. We asked new members to give us a little background information and what they would like to see at the club in 2025. If you are a recent member and we missed emailing you, please drop us a note at [mvara.w8qly@gmail.com](mailto:mvara.w8qly@gmail.com).

**Patrick Lewis KQ4VZF.** I'm Patrick Lewis, KQ4VZF. I've been licensed since last August and have been enjoying the hobby immensely. I frequently chat on 2m repeaters and local nets here in Northern Virginia, where I live, but I've also recently set up an HF system and have been having a great time using my 10m technician privileges and will be working towards General Class this Spring. As for how I came to join MVARA while living in Virginia, my grandmother lives in Poland and I spend a few weeks there each year. The repeaters are a lot more active in the Valley and I really enjoy chatting on them when I'm in the area! Outside of radio, I'm currently in college at The Catholic University of America in Washington, D.C., studying history and politics, where I also serve as politics editor of the student newspaper and vice president of the history club. My other main hobby is birding (bird watching) and related topics.

## Steve Cannon KD8YMF.

I have a Baofeng uv5, uv5r, a Yeasu vx5, Icom ID-50, a Yeasu FT-70, Anyone 878UVII+ ht's, a Yeasu FT8900, FT1802, FT2400 mobile s. I am currently studying for my general, I enjoy target shooting and reloading. I belong to the MVARA, the Warren radio club, the Western Reserve Fish and Game club. I am also an ARRL member. I enjoy every bit of it. (Holy Smokes Steve – that's a lot of radios! -ed)

Welcome aboard to all our new members, it's such a thrill to see the new faces and interests. Please don't hesitate to ask if there is something we can help you with.

This is also a good time to mention that the club has several loaner HF radios available to members for temporary use. They include a power supply and external antenna tuner if the radio does not have it internally. Most also come with a multiband dipole antenna. Drop us a note to [mvara.w8qly@gmail.com](mailto:mvara.w8qly@gmail.com) if you are interested in using one of the radios.

## Meet Our Long Time Members

We also started introducing some of our senior members and that has also gone over well. If you have been with the club for some time, we would enjoy hearing some of your experiences and recollections. Drop us a note to [mvara.w8qly@gmail.com](mailto:mvara.w8qly@gmail.com) if you are interested.

Fred Sole WB8LVP. Most of us know Fred as the King of the 745 repeater as he can be found on the repeater at most any time of day. Fred comes by that naturally. First licensed in 1974, Fred went from Tech to Extra in a short time. Keep in mind CW was part of the test as well. At the time, VHF 2M Ham Radio was in its infancy and there were no commercially available 2M rigs. Fred had a knack with hardware, and he acquired a used Motorola lunch box radio similar to the one in the picture. He was able to modify it for use in the Ham bands and was on the 910 repeater and 520 simplex. It was a two-channel radio!





Professionally Fred's career included stints in Engineering at WFMJ Television, Chief Engineer at WYSU, and the YSU IT department to wrap up his career. Much of his success at YSU can be attributed to his experience with Ham Radio. People with RF experience are hard to come by and combined with his adventures in Amateur Packet radio, he was an asset to YSU.

## Upcoming Contests and QSO Parties

Dave Fairbanks N8NB

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

<http://www.contestcalendar.com> .

February 2025	
+ Vermont QSO Party	0000Z, Feb 1 to 2400Z, Feb 2
+ 10-10 Int. Winter Contest, SSB	0001Z, Feb 1 to 2359Z, Feb 2
+ Mexico RTTY International Contest	1200Z, Feb 1 to 2359Z, Feb 2
+ FYBO Winter QRP Sprint	1400Z-2400Z, Feb 1
+ Minnesota QSO Party	1400Z-2400Z, Feb 1
+ British Columbia QSO Party	1600Z, Feb 1 to 0359Z, Feb 2 and 1600Z-2359Z, Feb 2
+ AGCW Straight Key Party	1600Z-1900Z, Feb 1
+ North American Sprint, CW	0000Z-0359Z, Feb 2
+ Marconi Club ARI Loano Slow CW QSO Party	1300Z-2300Z, Feb 2
+ RSGB 80m Club Championship, SSB	2000Z-2130Z, Feb 3
+ VHF-UHF FT8 Activity Contest	1700Z-2100Z, Feb 5
+ FISTS Saturday Sprint	0000Z-2359Z, Feb 8
+ CQ WW RTTY WPX Contest	0000Z, Feb 8 to 2359Z, Feb 9
+ OMISS QSO Party	1500Z, Feb 8 to 1500Z, Feb 9
+ CQC Winter QSO Party	0100Z-0259Z, Feb 9
+ ARRL School Club Roundup	1300Z, Feb 10 to 2359Z, Feb 14

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<a href="#">±</a> ARRL Inter. DX Contest, CW		0000Z, Feb 15 to 2400Z, Feb 16
<a href="#">±</a> YLRL YL-OM Contest		0000Z, Feb 15 to 2359Z, Feb 16
<a href="#">±</a> VHF-UHF FT8 Activity Contest		1700Z-2100Z, Feb 19
<a href="#">±</a> CQ 160-Meter Contest, SSB		2200Z, Feb 21 to 2200Z, Feb 23
<a href="#">±</a> South Carolina QSO Party		1500Z, Feb 22 to 0159Z, Feb 23
<a href="#">±</a> NA Collegiate Championship, RTTY		1800Z, Feb 22 to 0559Z, Feb 23
<a href="#">±</a> North American QSO Party, RTTY		1800Z, Feb 22 to 0559Z, Feb 23
<a href="#">±</a> North Carolina QSO Party		1500Z, Feb 23 to 0100Z, Feb 24

**Credit for the below information and further information on these operations and others can be found at the following website:**

<http://www.ng3k.com>

2025 Feb01	2025 Feb06	Senegal	9G5IK
2025 Feb02	2025 Feb28	Senegal	6W7
2025 Feb04	2025 Feb18	Anguilla	VP2ECV
2025 Feb05	2025 Feb18	Cape Verde Is	D44OA
2025 Feb08	2025 Feb15	St Helena	ZD7KYD
2025 Feb11	2025 Feb18	Cocos Keeling	<a href="#">VK9</a>
2025 Feb11	2025 Feb23	Marshall Is	<a href="#">V7</a>
2025 Feb12	2025 Feb16	Bahamas	<a href="#">C6ADA</a>
2025 Feb06	2025 Feb14	Togo	5V0DX
2025 Feb16	2025 Mar04	Sint Martin	PJ7
2025 Feb16	2025 Feb25	St Pierre & Miquelon	FP
2025 Feb16	2025 Mar04	St Martin	FS

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2025 Feb18	2025 Mar04	Christmas I	<a href="#">VK9XU</a>
2025 Feb19	2025 Feb27	St Martin	FS

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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: [mvara.w8qly@gmail.com](mailto:mvara.w8qly@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--you don't need to be an MVARA member. You can include a picture for your listing. Please submit your list to [mvara.w8qly@gmail.com](mailto:mvara.w8qly@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 we are notified otherwise.

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 members. Contact Nancy, [nanceanne34@gmail.com](mailto:nanceanne34@gmail.com) for 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](mailto:mvara.w8qly@gmail.com)

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

SKYWARN NET - 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.

### ***Disclaimer***

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