The Pickle Barrel Review

THE OFFICIAL NEWSLETTER OF THE WESTON MOUNTAIN DIGITAL RADIO ASSOCIATION

June 2025

Introduction

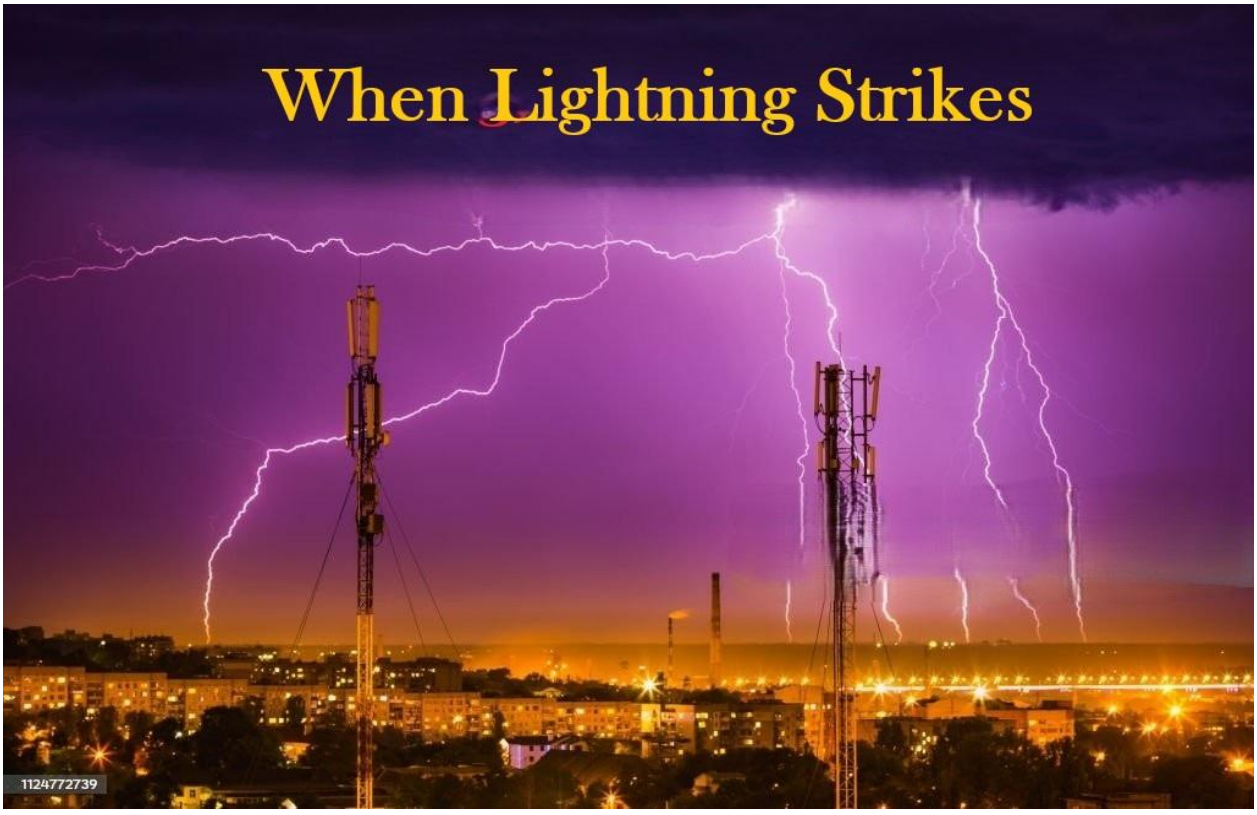
Greetings one and all, and once again welcome to the Pickle Barrel Review! As in the previous issues, you'll find this issue filled with the latest happenings not only of the W7NEO system, and the NE-OREGON room, but System Fusion, Allstar, along with GMRS. All that said, as always, we invite others to contribute with articles, or if your club or organization is having an event such as a tailgate, swap meet, VE testing, or whatever, you can list it here as well. The only thing we ask is that your contribution be nonpolitical (unless it's a government action that directly affects Ham, or GMRS Radio), respectful of others (no personal attacks), and relatively family friendly. We realize your pretty darn proud of it, but we really don't want to hear about your new tattoo, let alone just where exactly it's located on your body. And just to be clear, we apologize, but unfortunately your brother-in-law's bachelor party

still doesn't qualify as an upcoming event. So, all that said, feel free to reach in the barrel, grab yourself a pickle, pull up a chair and have ah sit for a spell as we discuss the latest happenings in Fusion, Allstar, GMRS, and Personal Radio Communications in general. And for the record, you can rest assured that every line of the PBR is a 100% AI free zone, and will remain so (As proof just look at all the mistakes!).

A word from our sponsor

Vern and Moraine's Bait and Tackle Shop.
For all your fishing needs.
Vern and Moraines Bait and Tackle shop, where when we say; "We've got worms!" it's not always a bad thing.

Natures Wrath



Over the years when I've been asked about lightning, and protecting equipment from its effects, I usually tell people that Lighting is like an unruly child, the trick is to present it with choices, and hope that it chooses the one

that does the least amount of damage. Like everyone else, I've heard the stories of the damage that has been inflicted upon people, radio equipment, and property in general. Most recently I was talking with a fellow repeater owner who related to me about one of his sites located in central Oregon that had gone off the air. When him and his wife arrive on the site to investigate, they noticed bits and pieces of fiberglass scattered all around the base of the tower. Upon closer inspection, they saw that the commercial grade repeater antenna that was once perched on top of the tower, had vanished and now only the charred remains of the base of the antenna remained. It wasn't hard to surmise that the antenna had taken a direct lightning hit, and quite literally exploded from the force of the strike. From my own experience, I can attest that those antennas aren't cheap, so it was most likely a very expensive light show.

But before we get into just what options might be the best for protecting our radio equipment, and possibly avoiding finding the remains of your antenna scattered around the base of your tower, we need to first examine just what it is that makes up a lightning strike, and just why it is that it's so devastating.

Lightning is usually produced by Cumulonimbus clouds, which have bases that are typically 1–2 km (0.62–1.24 mi) above the ground and tops up to 15 km (9.3 mi) in height. Lightning itself is viewed as a natural phenomenon consisting of electrostatic discharges occurring through the atmosphere, primarily inside a storm cloud. Within the cloud there are both positive, and negatively charged particles resulting from moisture which combine and separate thereby creating a steady buildup of static electricity. At some point in this process the static charge buildup reaches a breaking point and discharges within the cloud. This is referred to as either Intercloud, where the lightning is contained within a single cloud, or Cloud to Cloud, where the lightning transfers between two or more clouds. Then there is the strike that concerns us, and is the primary topic of this piece, which is Cloud to Ground, or "CG."

Cumulonimbus cloud.

An interesting little fact regarding how thunder is produced, which coincidentally is very similar to my Uncle Frank (Or perhaps even Aunt Clare, but don't tell her I said that). As a biproduct you might say, lightning also causes thunder. A sound originating from the shock wave which initially develops as the heating up of gases in the vicinity of the lightning discharge. How this works is the gases experience a sudden increase in pressure, and thus expand outward from the source of the lightning creating a shock wave audible as thunder. Although I can't confirm this, my gut tells me that this may just be where the term "Thunder britches" originated from, but don't quote me on that one.

Lightning itself involves a near-instantaneous release of energy on a scale averaging between 200 megajoules and 7 gigajoules. The air around the lightning flashes rapidly reaching temperatures of about 30,000 °C (54,000 °F). Additionally, there is an emission of electromagnetic radiation across a wide range of wavelengths, some visible as a bright flash. If that wasn't enough, lightning strikes can also generate an electromagnetic pulse (EMP). This is because lightning acts as a powerful, natural electromagnetic wave generator, releasing a burst of electromagnetic energy

into the surrounding area. As in the case of a nuclear airburst explosion, this EMP can have significant effects on electrical and electronic systems, potentially causing damage or disruption. I've got your attention now don't I.

So, what exactly is the sequence of events during a cloud to ground strike? To be clear, cloud-to-ground lightning is a lightning discharge between a thundercloud and the ground. Of the three primary types of lightning, cloud to ground strikes pose the greatest threat to life, property, and in our case, radio equipment. A cloud to ground strike is actually comprised of several repeated strikes, or processes, hitting a single area in a matter of microseconds. The overall discharge, termed a flash, is composed of a number of these processes such as preliminary breakdown, stepped leaders, connecting leaders, return strokes, dart leaders, and subsequent return strokes. IEEE defines a lightning strike as taking the form of a pulse, which typically has about a 2 μs rise time, and a 10 ~ 45 μs decay to a 50% level. The peak current will average 18 kA for the first pulse, and less than half for the second, and third pules, with three being the average per strike. The conductivity of the electrical ground, be it soil, fresh water, or salt water, may affect the lightning discharge rate and thus the overall visible characteristics of the strike as a whole.

Leaders generally move downward from the cloud or upward from very tall ground objects. Leaders can be negatively charged or positively charged.

It's worth noting that lightning in general comes in two flavors, depending upon the polarity. Cloud-to-ground lightning is either positive or negative, as defined by the direction of the conventional electric current between cloud and ground. Most CG lightning is negative, meaning that a negative charge is transferred, or in other words, the electrons flow downward to ground along the lightning path. The reverse happens in a positive CG flash, where electrons travel upward along the lightning path, while simultaneously coinciding with a positive charge which is transferred downward to the ground, or the opposite path. I know, confusing right? Just remember that either way it's not going to end well.

Positive lightning is less common than negative lightning and on average makes up less than 5% of all lightning strikes.

So, what happens when it actually strikes the ground you ask. Once a lightning strike hits an object, let's say a tree for example, the charge spreads out from the point of impact along the surface of the ground. This ground current can injure or kill people nearby, and in the case of radio sites, damaging, or even destroying equipment. A good example of this is when a bolt of lightning lands in an open field where cows just happen to be grazing. As a result, several of the cows around the impact area suddenly drop dead from electrical shock. Although they didn't take a direct hit, they were close enough to the strike to feel the wrath of the ground current resulting from the strike.

The moment cattle realize that the barn is looking better by the minute.

As a note of historical trivia, the deadliest lightning incident in recorded history took place in 1769, in the city of Brescia, Italy. As the account recalls, lightning struck the Church of St. Nazaire, igniting the 90 tons of gunpowder being stored within its vaults; the resulting explosion killed upwards of 3,000 people and destroyed a sixth of the city. I'm sure this may have been seen as a bad sign from above following the death of Pope Clement XIII, who passed away that same year right after having prepared an order to dissolve the Jesuits.

Artist depiction of lightning caused explosion, 1769 Brescia, Italy.

So, what can we do to lessen the effects of a lightning strike, thereby giving our unruly child a choice that is (hopefully) going to significantly reduce the overall damage to our radio equipment? Over the years I've heard two schools of thought regarding how best to protect radio equipment, and antenna systems. Some say good grounds are the answer so as to divert the effects of the strike away from the equipment, and directly to an earth ground. Others insist upon no grounds at all, thereby removing a path to the equipment entirely. Personally, I tend to be on the side of "proper" grounding. But to qualify that, I do agree that it needs to be installed correctly, and not simply randomly slapping up a bunch of wire expecting it to protect your site in the event of a lightning strike.

Not all that long ago our Cabbage Hill site suffered a near strike resulting in ground current making its way into the building via the grounding. Fortunately, since I had installed a good solid single point grounding system, I simply replaced a couple of blown fuses, and everything was back up and working in a matter of minutes.

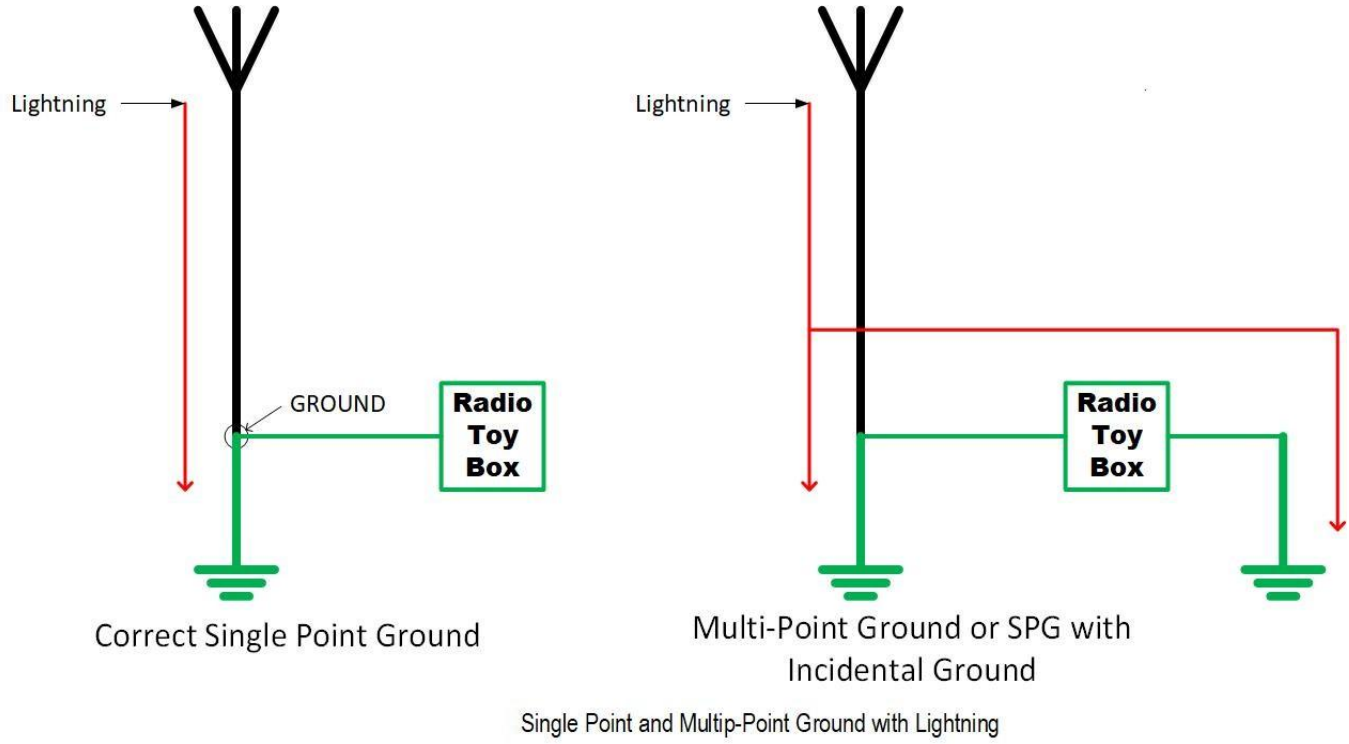
But in order to better understand the how's and why's of all this, we need to dig alittle deeper in order to better understand what exactly is meant by "proper grounding."

It's a well-known fact that radio sites with large antenna towers are the most common target of lightning strikes in general. When you have a metal tower rising 100+ ft into the sky it becomes a tasty temptation for Thor and his wrath. Every tower is going to have a certain amount of inductance based upon not only its height but its width as well. For example, a 150 ft tower with 35-inch side widths is going to have approximately 40 μH of inductance. Start adding up the coax, guy wires, and even the connecting joints of the tower itself that are all part of the overall installation and the inductance goes up even further. Why is this important? Tower inductance equates to its ability to conduct electricity, or in our case, pass a lightning strike to ground.

In the case of commercial repeater antennas, most all of them are DC grounded, as an accepted industry standard. In other words, when the antenna is mounted on a tower, it becomes electrically grounded to the tower itself. This will offer a degree of protection from lightning strikes, but remember, an antenna is by design, a resonant circuit. So, in other words, much of the ringing produced during a strike will be shunted to ground (provided your tower is properly grounded) but whatever ringing is produced at the resonant frequency of the antenna, and your system in general, will be passed along to your equipment via the coaxial feedline.

In the case of an antenna installation, a single Point Ground (SPG) offers the highest level of lightning protection, and system performance possible. That said, always be watchful not to compromise the single point ground by introducing an Incidental ground, and creating a ground loop. Current must have an entry point to enter and an exit point. In other words, it needs a door

to enter the building and another door to safely exit. All the cables entering the protected area must pass through, be bonded to the SPG bus-bar, and remain isolated from incidental contact with other grounds. Once inside, the current path must never see ground again. Otherwise, this puts you right back into a ground loop situation, which places your equipment at risk due to there not being a path inside for lightning to find the earth. If you follow the path on the figure below, it becomes a bit clearer just how a Single Point Ground operates and can fail if compromised by adding an additional path to ground, thereby creating a ground loop. This sort of grounding is common place in most all commercial communication facilities, which rarely have any issues with Lightning, and RFI/EMI.



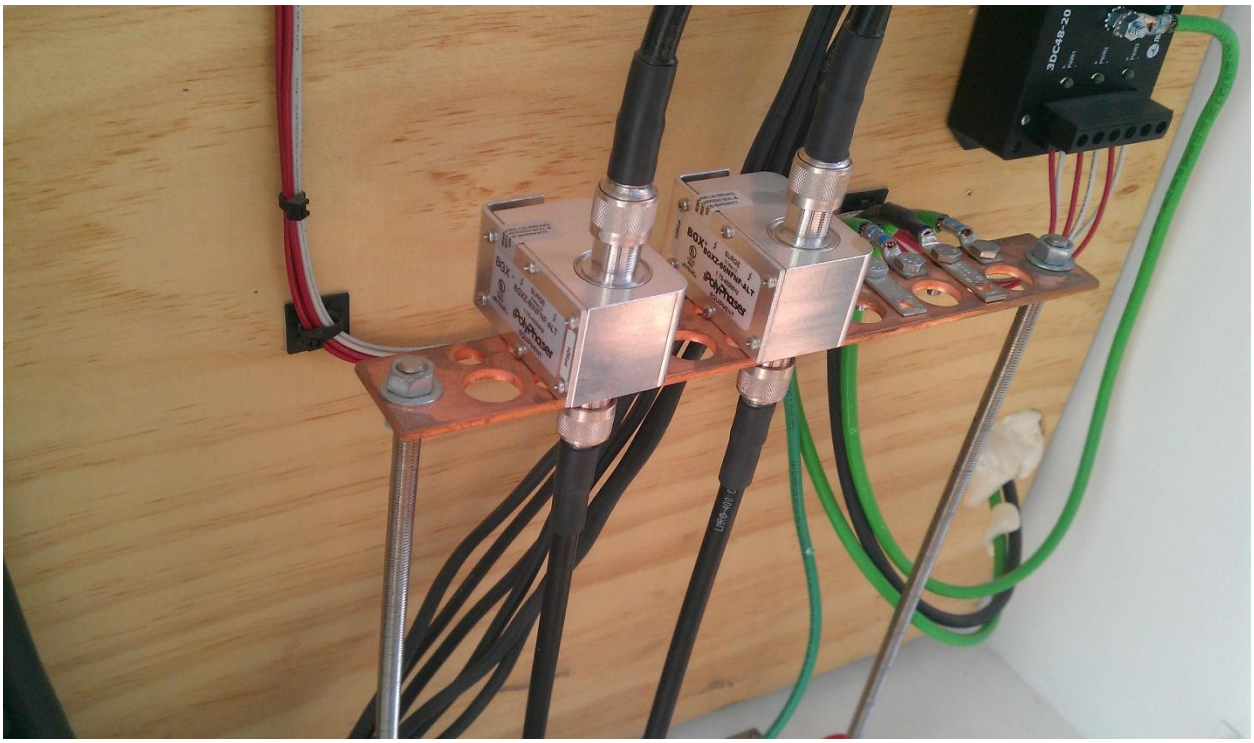
Single Point, and Multi-Point antenna grounding.

While examining coax lines, it's worth considering that when a lightning strike reaches the open end of an unused coax line there will typically be an arcing from center conductor to shield, and on to the grounding plate. Of course, most of us that have worked with antenna systems know that it's rare that any coax goes unused. So given that most coax is generally connected to equipment, voltages traveling down the coax will be converted into current

via an arrester, shunt fed cavity, or by arcing over DC blocking capacitors. Some of which will unfortunately make it to the equipment. Bonding is viewed as one method to reduce the effects of this by intentionally electrically connecting equipment and apparatus to a solid ground reference with a bonding jumper of sufficient thermal capacity. Bonding refers to connecting the coax shield (and other metal parts) to a common ground point, while providing a path for electrical current to flow to the earth, protecting equipment and people from electrical surges. This is especially important for radio antennas, which typically are high above the ground making them more likely to be struck by lightning. In the case of antenna grounding, it's good practice to ground or "Bond" your coax shield at the top of the tower just prior to the base of the antenna. Some other common examples of bonding include equipment chassis, cabinets, equipment racks, enclosures, raceways, radios, and ground rods bonded together. Bonding Jumpers use different names to define their purposes, such as AC Equipment Grounds (ACEG) or DC Equipment Grounds (DCEG). In some cases, this can be used as a method in order to reduce noise, such as common mode, within communications equipment installations.

The National Electrical Code (NEC) requires that the antenna mast and the coaxial cable be bonded to the buildings Ground Electrode System (GES), which is usually the ground rod installed at the power meter and breaker box. There are other options, but the GES method is the preferred.

In addition, the installation of a lightning arrester (a surge protector) to further protect the coax and equipment from electrical surges is highly recommended. This will address the ringing currents that are produced near the point of resonant frequency. Although there are several different flavors, the most commonly recommended has an ultra-low loss "Negative-Positive-Zero" (NP0), high voltage breakdown blocking capacitor. An issue with most DC arresters is that due to their design they have inherent delays in firing, which allows a quantity of current to get passed through, potentially causing damage to equipment. With the NP0 arrester the gas fires quickly for better current isolation. These are the type of arresters manufactured by Polyphaser, which is what we use with the W7NEO repeater system.



Typical grounding with Polyphaser arrestors similar to what is installed at W7NEO repeater sites.

In summary, it is important to note that for communications installations such as ours to be effectively protected from lightning strikes, a single point ground is the key to success. So, if the equipment has a separate ground associated with it, then this will create a parallel ground path which would allow strike current to flow through the equipment chassis which would guarantee substantial damage to the system.

Needless to say, there is plenty more to cover on this topic, when it comes to protecting our precious radio equipment. But we only have a limited amount of space to cram it all into. So just remember as I said in the beginning; "Lightning is like an unruly child, the trick is to give it choices and hope it chooses the one that inflicts the least amount of damage." Hopefully, this article has provided a little better understanding of just what choices to offer up, and why.

Lynn, K7LW

Repeater Updates

With the recent uncertainty regarding the future of the many Federal agencies we've all come to rely upon, especially in the case of FEMA, and the National Weather Service, it may fall upon the Amateur Radio community to fill in some of the gaps left behind when it comes to emergency communications, and the ability to provide early warning of severe weather events, and natural disasters in particular.

That said, I recently paid a visit to one of my old haunts back when I was employed by the Federal Government. That being the National Weather Service Weather Forecast Office (WFO) located in Pendleton Oregon.

I wanted to get their take on the future of the invaluable public services they provide, specifically early warning of severe weather events. As a result of the DOGE kids and their reckless actions under the watchful eye of Elon Musk, as with most other Federal agencies, the Pendleton Weather Forecast Office staffing was recently slashed by nearly half. In spite of that, I was assured by the staff I spoke with that they plan on continuing to provide 24 hour a day, 7 days a week reliable forecasting as they always have. I know from my own experience working for the NWS, they are as dedicated to their job, and their community as ever. You just can't buy that level of personal commitment.

As it was when I was employed by the NWS, and those before me, their Mission Statement says it all:

"The National Weather Service's mission is to provide weather, water, and climate data, forecasts, warnings, and impact-based decision support services for the protection of life and property and to enhance the national economy. This is accomplished through reliable, timely, and accurate analyses, guidance, forecasts, and warnings."

So, with that said, the WMDRA will be looking into upgrades for our system which will better enable our system to broadcast any future Advisories, Watches, and Warnings that may originate from the National Weather Service.

As most of you that are regular users of the W7NEO system are aware, we currently have a feature on our analog repeaters called “SkyWarn Plus,” as part of our Allstar system. This feature broadcasts over the system in the event of any Advisories, Watches, or Warnings currently active by the NWS as they apply to specific sections of the local County Warning Areas (CWA). It is our hope that by adding the extra layer of public notification we (WMDRA) will be able to better serve our local community with early notification of severe weather events in the future.

Lynn, K7LW

For a complete list of NOAA Weather Radio broadcast stations, and frequencies in Oregon click here.

For a complete list of NOAA Weather Radio broadcast stations, and frequencies in Washington click here.

A well deserved Official Recognition

I know we as Amateur Radio folks don’t normally seek any reward, or public praise for responding in times of need. It’s simply something we do because we can, and in our view, helping our community during times of need is simply the right thing to do. But, it’s still nice to get an official nod of approval every now and then.

So, when Oregon Governor Tina Kotek declared June “Amateur Radio Month,” in recognition for all of the contributions in providing emergency communications by Amateur Radio operators, particularly during last year’s wildfires, it felt nice to be officially recognized.

With that said, well done to not only those Amateur Radio operators living in Oregon, but all over this great nation of ours, you’ve all earned it!

STATE OF OREGON

PROCLAMATION

OFFICE OF THE GOVERNOR

WHEREAS: The State of Oregon has more than eighteen thousand FCC-licensed Amateur Radio operators; and

WHEREAS: Amateur Radio operators have demonstrated their value in public assistance by providing emergency radio communications during storms, wildfires and other disasters; and

WHEREAS: Amateur Radio operators provide services free of any charge to the communities in which they live, in the interest of the citizens of Oregon and the world; and

WHEREAS: Seaside, Oregon, and the Amateur Radio operators of Oregon host ARRL's Northwest Division Convention from May 30-June 1, 2025; and

WHEREAS: Amateur Radio operators publicly practice their communication skills during the American Radio Relay League's Field Day exercise, June 28-29.

NOW, THEREFORE: I, Tina Kotek, Governor of the State of Oregon, hereby proclaim June 2025 to be

AMATEUR RADIO MONTH

in Oregon and encourage all Oregonians to join in this observance.

IN WITNESS WHEREOF, I hereunto set my hand and cause the Great Seal of the State of Oregon to be affixed. Done at the Capitol in the City of Salem in the State of Oregon on this day May 22, 2025.

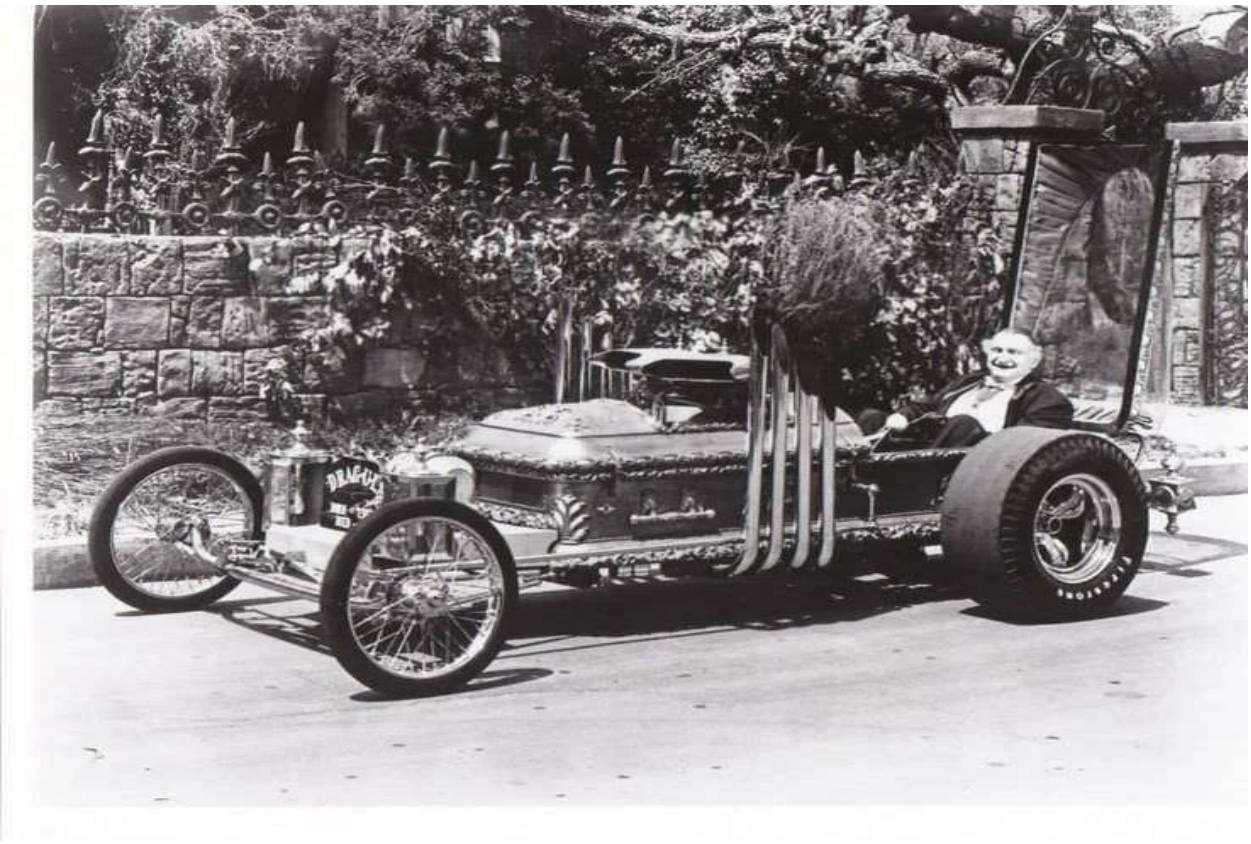
Tina Kotek, Governor

Tobias Read, Secretary of State

Ham Radio Nostalgia

Recognize this guy? If you grew up in the late 1960's early 1970's as I did, you never missed watching The Munsters on television every afternoon after school. Herman, Lilly, Eddie, Grandpa, and Maryln, and their menagerie of creepy pets were a staple of television back then. I even had a Revell model of their family car; "The Munster Koach."

The Munsters Koach with (left to right) Yvonne de Carlo (Lily), Fred Gwynne (Herman), Butch Patrick (Eddie), and Beverly Owen (the original Marilyn) in 1964.



Grandpa Munster (Al Lewis) and his DRAG-U-LA car.

Although I'm almost certain that I managed to watch all 70 original episodes, there was one episode in particular that always caught my attention growing up as a young Ham. That was episode number 18, which first aired on January 21st, 1965. Herman is playing around on his Ham Radio set one day, when he overhears some kids playing Martian with their walkie-talkies. Naturally the kids lead Herman and Grandpa into thinking there really ARE Martians on Earth, and being good citizens, they notify the Air Force, and the fun begins.

In the episode, Herman's callsign was given as; "W6XRL4," and ironically the callsign is still listed in QRZ to this very day. Although Fred Gwynne, who played Herman, was never a licensed Ham Radio operator, after graduating high school in 1945 he enlisted in the Navy. During his time in the Navy, he served as a Radioman Third Class on a submarine chaser in the Pacific Theater during World War II. During that time period he participated in the Battles of Saipan and Tinian. Gwynne was honorably discharged with the rank of Petty Officer Third Class in 1948.

Fred Gwynne passed away quietly in 1993 at the age of 66 in his home in Taneytown, Maryland from pancreatic cancer. But his legacy continues to live on with the Herman Munster Memorial Radio Club, WX6RL in Atlanta Geogia. Fred was also known by many for his overwhelming generosity, and good humor. That, and his infectious laugh I'm sure will be sorely missed for decades.

Herman Munster (aka: "Fred Gwynne"), W6XRL4 (SK).

Lynn Wilson, K7LW

Current events

Since its original inception back in 1933 as a way of practicing portable operation for emergency communications, this has been one of mine, and many other Ham's favorite time of year throughout the country. Yep, you guessed it, it's Field Day! This is the one time of year when we all get to go out and bond with nature while packing a bunch of radio equipment along for the ride. And what better way to promote the Ham Radio hobby to the general public? As always, this year's Field Day is the very last weekend of June, falling on the 28th and 29th. For specific locations of some of the local clubs here in North Eastern Oregon, and South Eastern Washington, just check out any one of the links located in the "Links" section of our website.

In the past I've spoken with most all of the local groups to get their take on GMRS folks showing up. The response was overwhelmingly positive. So, even if you're not a Ham, but still have the radio bug, and are active on GMRS, your more than welcome, and heartily encouraged to checkout a Field Day activity going on near you.

Hopefully see you there!

New Ownership

Just to let some of you know that may have been considering the purchasing of an amplifier, a long-time icon of Amateur Radio RF amplifiers has recently changed ownership. Henry Radio has been around since the 1920's. The

original Henry Radio shop, started by Ted's brother Bob Henry, W0ARA, opened in 1927 in their hometown of Butler, Missouri, selling equipment and parts for the then-new ham radio hobby. They have always produced a solid product in all their amplifiers from HF to UHF. Our 146.88 repeater located at our Cabbage Hill repeater site has been using a 100W 100% duty cycle Henry amplifier for several years now, without any issues.

This email was forwarded to me by one of our WMDRA members:

On October 1, 2022 the Henry amplifier facility on Bundy Drive in Los Angeles closed its doors. The future sales and service for Henry amplifiers will be the responsibility of the new management whose contact details are below.

Henry Amplifiers

Bob Burchett

22826 Mariposa Avenue
Torrance, CA 90502

310 534-4456 (phone) |

Thank you,

Ted

Ted S Henry - HENRY RADIO, INC.

1545 Cherryville Road

Greenwood Village, CO 80121

310-820-1234 Option 1

Hopefully the new owners will continue the tradition of quality amplifiers.

Lynn, K7LW

VE Testing

There is no VE testing going on that we're aware of, but if you check the Links section of our website, there may be information on some of our friend's websites as to where you might find a test session going on near you.

But in the meantime, if you do have a regular test session taking place, feel free to let us know, and we'll post it here in the next issue of the Pickle Barrel Review.

The End

Well, that's about it for this edition of the Pickle Barrel Review, I hope you enjoyed it. We'll continue to work to keep it informative, fun, and interesting. So, until next time, we here at the WMDRA (W7NEO) hope everyone is enjoying the warm summer weather, along with some relaxing quality time on the air. In the meantime, feel free to reach in the barrel, and grab another pickle. There's plenty to go around, along with plenty of great conversation!

73,

Weston Mountain Digital Radio Association,
W7NEO

""Be yourself; everyone else is already taken."
— Oscar Wilde