

# TCARES - Tuolumne County Amateur Radio & Electronics Society Amateur Radio Club Summer 2026 Newsletter

June 21, 2026



## Elizabeth Peak POTA Event, May 2, 2026

### Spring is Over and Summer has Officially Arrived!

Hello TCARES members - Happy Summer Solstice *AND* Father's Day! As always, this quarter's newsletter articles are meant to *teach*, *inform*, and *inspire*! The TCARES club newsletter helps to keep us informed of the news of interest from the last quarter, along with promoting connections between club members. Our article authors have put effort into their pieces and we hope you enjoy their contributions, keeping you aware and actively engaged in our club.

We continue to have breakfast meetings at [My Garden Cafe](#), in east Sonora at 9 am on the 3rd Saturday of the month - come join us and connect with other Hams! We hope to see you all at the next [TCARES Club Breakfast](#) meeting on [July 18<sup>th</sup>](#). Many other events are listed on the TCARES club [Events Calendar](#) (upcoming events are listed on the right side of the webpage). So, please, come join in on the fun and get connected with other hams!

## Coming Up:

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### Dates to Remember

<b>June 21</b>	Summer Solstice
<b>June 27</b>	ARRL Field Day
<b>June 27</b>	TCARES FCC VE Exam Session
<b>June 27</b>	Winlink Radio Email Class
<b>June 27</b>	N1MM Logging App Training
<b>July 1</b>	Membership Dues Renewal Date
<b>July 11</b>	Intro to Radio Class
<b>July 18</b>	TCARES Breakfast Mtng
<b>July 18</b>	TCARES Board Meeting
<b>TBA</b>	"How to Use a Handheld Radio During an Emergency" Class
<b>August 9</b>	50th Annual Pinecrest Run
<b>August 15</b>	TCARES Breakfast Mtng
<b>September 19</b>	Multi-County Ham Club Picnic

# President's Message

by Jeff Tolhurst

**N6JWT**



## President's Message

Summer has arrived - happy Summer Solstice, and happy Father's Day, too! As I write this, I am enjoying the longest day of the year, looking out over the Columbia basin, where, yesterday, I witnessed aircraft flying over the foothills of the Sierra Nevada. Some of our club members were finishing buttoning up the TCARES trailer, after a successful day at the Columbia Airport's Father's Day Fly-In, demonstrating what amateur radio is, and does, for our community. We are a group of like-minded people, connected through radio technology, bringing us together socially, intellectually, and more. I had just come from the club breakfast at the My Garden Cafe, where about a dozen of us showed up, talked, told stories, connected with new members, and enjoyed some comradery. We got some historical insights on the club from Phil, WB6GGY, Greg, WA6HNA, and George, N6GEO, who shared stories about the development of the repeater system, 45 years of RACES service (thanks Phil!), and more. We also heard that Tim, KO6LLM, met his wife in the girls bathroom at school - ask Tim for the details, it's an interesting story! Larry, K6LMM, Mark, KG7BOG, Tom, KO6LXG, and Charlie, N6CFH, also shared stories about their lives, and how they'd gotten into amateur radio - great stuff! It was a busy day with the Fly-In, plus the breakfast going on at the same time. Next weekend we'll all be in one place, however, for Field Day!

Field Day will be packed with events. It will be held at the Pinecrest Academy School, up near Cold Springs (see [tcares.net](http://tcares.net) for details, maps, and directions). Grayson, KE6KYI, will be leading a VE testing session in the morning. Rich, KK6RIC, and Greg, KN6RUQ, will be teaching a session on Winlink (radio email). Then George, N6GEO, will lead a session on N1MM logging software that the club will use for Field Day. If all entries are digital, then no one will get stuck having to type them in by hand, which will be very helpful. The Pot luck BBQ (bring a side dish or desert) starts at 4 pm, so come for part, or all, of one of the club's biggest events of the year!

In talking with Ned, K6NED, there are changes happening at the county with the Office of Emergency Services (OES). The reorganization currently happening, based on the County Board of Supervisors' recent decisions, means that we will be seeing some new faces, which gives the club an opportunity to review our own emergency policies, procedures, and best practices, as well our how we interface with the different agencies we have worked with in the past. If you are interested in being involved with emergency communications, within the club, please reach out to Ned, and/or me, since we'll be calling a meeting to discuss the changes.

Finally, we have a new columnist, Jay Goldberg, KB6ENY/WSHT470, who has written an excellent article on severe weather, HF comms, and POTA ops. Thanks Jay - welcome aboard! Enjoy everyone!

73, jeff

# N6GEO's Soldering Party April 11, 2026



# Antenna of the Month

By [Gary W. Johnson](#)  
**NA6O**



## Measuring Ground Constants

Ground conductivity and dielectric constant (relative permittivity) directly affect the performance of our antennas. When simulating an antenna, getting these values wrong will result in errors in the pattern and feed point impedance. This is especially true for designs that have elements close to the ground, such as radials, or any kind of low antenna. Results may be so far off as to turn you into a non-believer in simulation when you actually build and test your design.

Simulators like EZNEC include default parameters for various types of ground with names like “extremely poor” and “very good.” The corresponding numeric values (also published in the ARRL Antenna Book) are derived from 1939 FCC measurements intended for use in the broadcast band. However, soil parameters vary quite a bit with frequency, thus guaranteeing errors when applied to the HF bands. But you can get better values from a webpage provided by Brian Beezley, K6STI. Brian assembled some charts and tables [Ref 1] that extrapolate those BC band data to the HF bands for much-improved accuracy. It’s better to start with that information.

Then there is another matter: What kind of soil do you actually have? The FCC has a map of ground conductivity for the USA [Ref 2]. Once again it’s for the BC band so the values need correction, and your particular location could be different due to all sorts of alterations to the local soil and of course moisture content. Also the map only shows conductivity but not permittivity. So this is again only a partial solution.

### When in Doubt, Measure It

Yes, you can directly measure your local ground constants. There are at least two ways. One is to use a special dielectric probe that is inserted into the ground and connected to an impedance analyzer [Ref 3]. After applying a formula, reliable results are obtained. Of course you need to make the special probe and it only measures data at single points. But it’s an excellent technique.

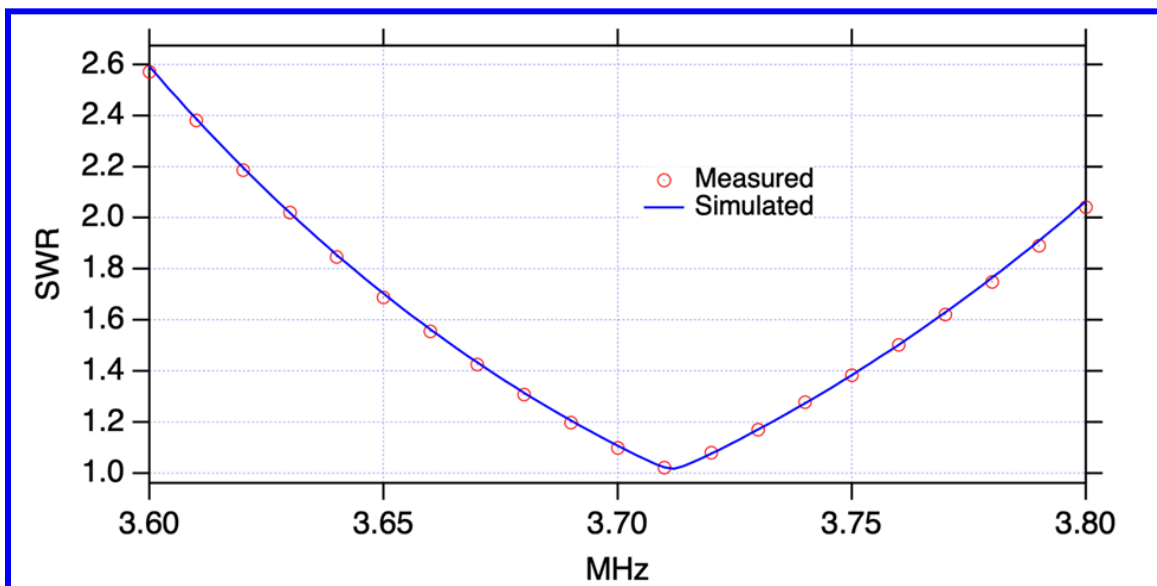
Another way to do the measurement is with a low dipole [Ref 4]. The beauty of a dipole is that it’s easy to build and easy to simulate accurately. Basically you measure it’s impedance and then in EZNEC you simulate the antenna geometry exactly and then adjust the ground parameters until the results match. The other advantage of this method is that it averages a large volume of soil. All you need is some wire, insulated supports, and enough space to string it up a few feet above the ground. Height is not important—3 to 5 feet is fine—as long as you *know* the height accurately. Also it will make simulation easier if you run it in a straight line. Finally, you will need a good common-mode choke at the feed point to prevent your (short length of) coax and equipment from becoming part of the antenna [Ref 5]. And of course you need a reliable impedance measurement device that displays

complex impedance ( $R+jX$ ). I used my Rig Expert AA-230 but a NanoVNA or many other instruments are fine.

## Some Actual Results

My friend Greg, KK6PXT, has been considering purchasing some new property so I went along to do RFI measurements with portable antennas. While I was at it, I put up a full-length 80 m dipole at 4 ft off the ground. It was made from 18 AWG magnet wire and had a good choke at the feed point. When I measured it, the resonance was at 3710 kHz and  $49.2+j0$  ohms. I also saved an SWR scan for later comparison.

The *exact* geometry (including the 3-foot feedline) was simulated in EZNEC using the NEC5 engine and a real/extended accuracy ground. (NEC 2 will be pretty close, too; just be sure to use a real/high-accuracy ground). Ground properties were varied by guessing until results perfectly matched simulation; it took me about 15 runs. I was focused on matching the impedance at resonance and finally nailed it. The result was conductivity = .0232 S/m, dielectric constant = 41. In the graph below, SWR data from my antenna analyzer and from the simulation are overplotted. This is a great validation of simulation! If I did not do this measurement, and didn't know better, I'd use the default values for "poor rocky soil", .002/13. That's way off, with resonance appearing 6 kHz low and  $Z = 95+j0$ .



Now that we know the values on 80 m, we can use the information from Ref. 1 to extrapolate to other bands. It turns out that I could have taken data on other bands while using this same antenna and then run the simulation at those other frequencies, again looking for matching impedances. In that case you do have to watch out for extremely high or low impedances where your analyzer may exhibit large errors.

## Conclusion

Don't trust the generic default values for ground constants. At the very least, use the estimates discussed here. Or dig into your junk box and put up a simple dipole, then spend some quality time

with EZNEC. You may want to repeat the test in wet and dry conditions as well. At last, you will have accurate ground data for your property and future simulations will be much more accurate.

## **Additional Comments Regarding Accuracy**

I had some discussion with Brian Beezley and he noted that like any metrology endeavors, the absolute accuracy of this measurement depends on more than just the wire geometry. First, the end insulators and even the small loops of wire have to be accounted for. Actually, minimizing them is probably the way to go. A miniscule insulator made from a small-diameter rod of low-loss polymer (e.g., polystyrene, Teflon, polyethylene) or fiberglass would be ideal. Then the loop of wire may also be negligibly small.

The other thing is your connection to the analyzer. Excess capacitance from cables and connectors must be included in the simulation or somehow minimized to a negligible level. Hand or ground capacitance is also a problem. Rudy found that his VNA had to be elevated off the ground with no hand contact, otherwise results would vary. My best solution is to solder the antenna wires directly into an N connector that's plugged into my Rig Expert analyzer. After pressing the start button, I can let go of it and walk away while it does its slow scan. Residual capacitance is very small, and there is essentially no feedline at all.

## **References**

1. Brian Beezley, K6STI, "HF Ground Constants" <http://ham-radio.com/k6sti/hfgc.htm>
2. FCC, "M3 Map of Effective Ground Conductivity in the United States for AM Broadcast Stations" <https://www.fcc.gov/media/radio/m3-ground-conductivity-map>
3. Rudy Severns, N6LF, "Measurement of Soil Electrical Parameters at HF" <https://rudys.typepad.com/files/qex-nov-dec-2006-soil-parameters-at-hf.pdf>
4. Rudy Severns, N6LF, "Determination of Soil Electrical Characteristics Using a Low Dipole." QEX, Nov/Dec 2016. <https://rudys.typepad.com/files/qex-nov-dec-2016-soil-characteristics-using-low-dipole.pdf>
5. Jim Brown, K9YC, "A New Choke Cookbook for the 160-10m Bands" <http://k9yc.com/2018Cookbook.pdf>

73, Gary

*Formerly WB9JPS, I have been licensed since 1972, and am originally from Illinois. I no longer have a home station due to RFI and other issues. But thank heavens I now have a fabulous remote station, W6SRR, which I share with Ian, W6TCP. I enjoy operating CW especially and have achieved 9BDXCC (total 318, working on 6m) and 10BWAS. I'm a fairly competent contester, member of NCCC, and station engineer at N6RO. Chasing SOTA activations is also in my fun category--I'm a certified Shack Sloth. My website is: <https://na6o.com/>.*

Andrew, K6AEF, Hosted a POTA Meetup at Elizabeth Pk.  
May 2, 2026

# Parks on the Air (POTA)

## Parks on the Air (POTA)



## USFS Elizabeth Peak POTA Activation



## USFS Elizabeth Peak POTA Activation



## POTA Member Webpage



**K6AEF**  
Andrew Firestone  
Tuolumne County, California

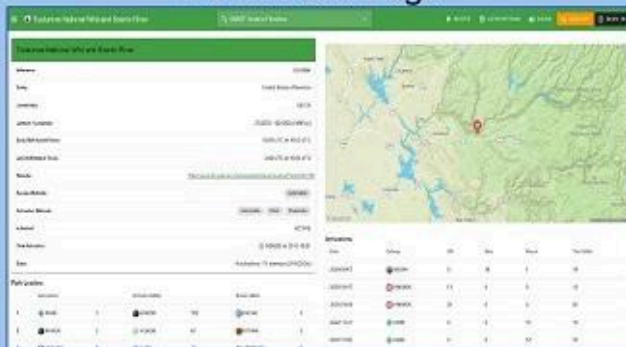
All-Time Statistics	
Station	Score
Activations	617
Hours	212
QSOs	6537

**Awards**

- Bronze Marker
- Silver Marker
- Gold Marker
- Platinum Marker
- Chartered Marker
- Supplier Marker

TCARES Participants included: Andrew (K6AEF), George (N6GEO), Mike (KM6YJP), Ginger (KM6RFT), and Jeff (N6JWT).

## POTA Park Page



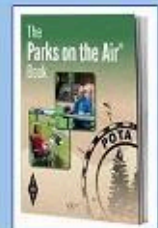
Elizabeth Peak POTA Park Page

Station	Score	Hours	QSOs
K6AEF	10	1	1
N6GEO	10	1	1
KM6YJP	10	1	1
KM6RFT	10	1	1
N6JWT	10	1	1

## Resources

Parks on the Air: [parksontheair.com](http://parksontheair.com)

POTA Website: <https://pota.app/>



**K6AEF**  
Andrew Firestone

Tuolumne County, California



# Meet Our Members

By [Ginger Rohlen](#)  
**KM6RFT/WSAP468**



Dave, AD6AE, was born on a farm in southwestern Pennsylvania, near Pittsburgh. "My dad was a coal miner and he and his brother owned several coal mines in the local area. I always asked my Dad a lot of questions because he was very educated, and familiar with all the sciences including math, chemistry, and physics. When I was 8, I asked him how a light bulb works when it's in the socket., "Well," he said, "stick your finger down in there and find out." After I did that, I said to myself, "Wow! That's really neat - I have to know all about it!" This was the beginning of Dave's life-long love of electricity and electrical systems.

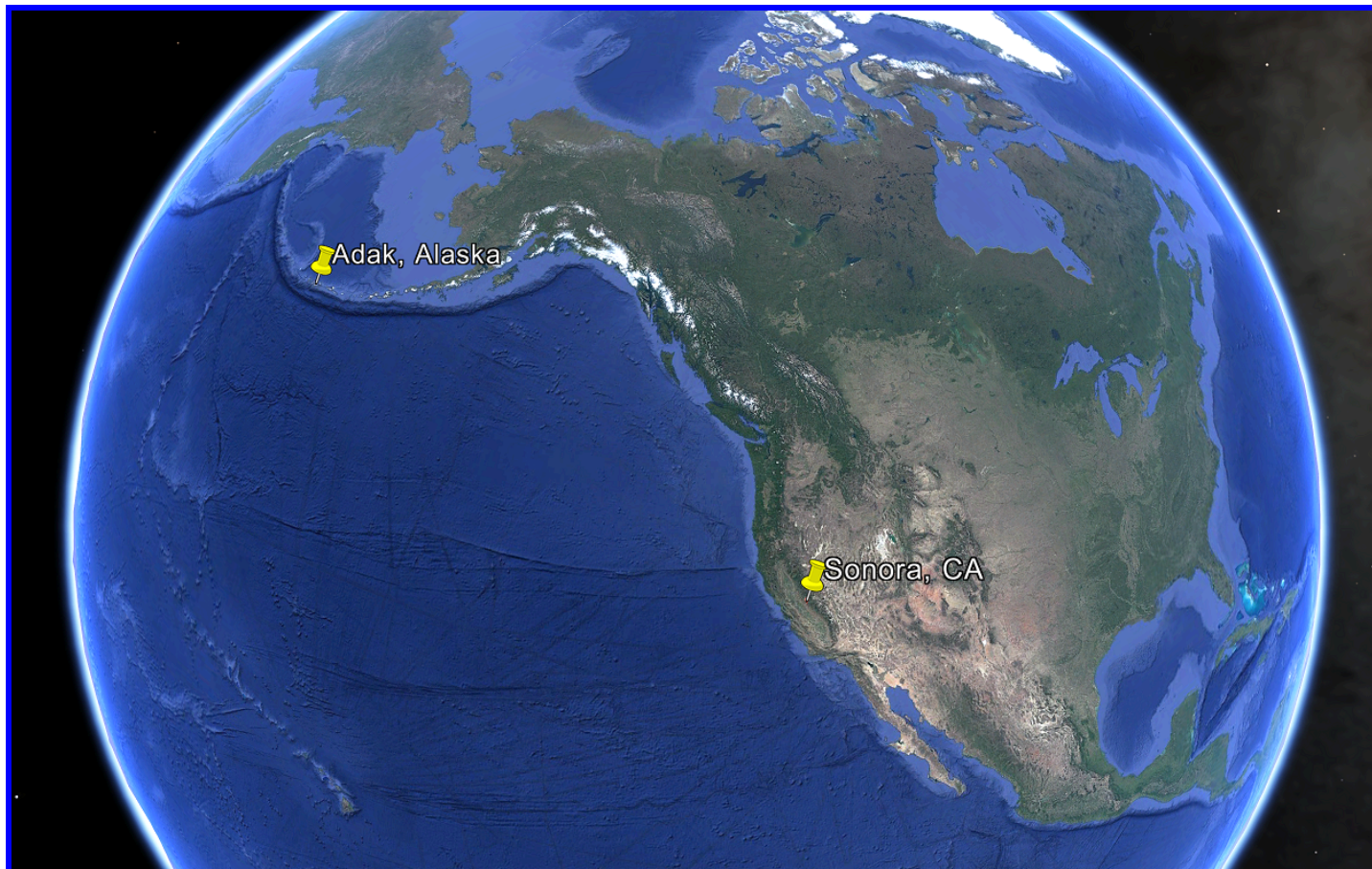
After the light socket incident, Dave became interested in radios. His dad had been an operator in the military police force and had some old radios that he gave to Dave to look at. "The first thing I did was tear them apart. When I asked him questions about the different parts of the radio, he encouraged me to study and experiment in order to find out how they worked." Upon learning that he was interested in radios, his neighbors collected all their old radios and gave Dave "...anything they could find that they didn't want, and they all had tubes in them." Eventually Dave cashed in some of the US Bonds he had saved up and bought an electronics kit containing one tube and a number of things you could make. Once he had all those memorized, his parents bought him another kit that had two transistors and instructions to build about 20 different things. Once he had mastered all of those, Dave got another in-home training kit, "that didn't have anything except a manual, and covered a different area every week. I blew through that. Electricity and Electronics were my first love."

The father of one of Dave's classmates was a well known reputable tv repair man. As soon as Dave got his drivers license, he would go over and watch her Dad work repairing tv sets. Patiently answering all of Dave's questions, he would take his test probe and outline the circuit he was trouble shooting and then explain all the components along the way and their purpose. Dave explains, " I was like a sponge and didn't forget any of it. I eventually learned the operation of all the components and how they fit together and what they would do. I knew all about the how but I still didn't know why. My Dad told me a long time ago, ' The person that knows how will always have a job. The person that knows why will generally be the boss.' I took that to heart." At the tender age of 14, Dave opened up his very own TV and radio repair shop, complete with a Pennsylvania State Sales license that he proudly displayed as instructed. "I played with this stuff all the way through high school. I never stopped from age 8 on. I never stopped the electronics pursuit."

After his high school graduation Dave attended the Electronics Institute in Pittsburgh to become an Electronics and Communications Technician. While there, he earned his First Class FCC Commercial Broadcast License with a Radar endorsement.



He then worked for a year as an engineering lab technician doing quality control and failure evaluation. "My job was to break stuff and analyze why it broke." Dave joined the Navy in 1967 and enrolled in the US Navy Advanced Electronics Field Program, where he became a Cryptological Data Processing Systems Maintenance Technician. This was a 6 year commitment because it included an additional 2 years of training. Dave was in the Great Lakes Naval Training Facility in Illinois when he returned home on leave and attended a gathering at his old high school. It was there that Dave met his wife. "We had always known each other because growing up we were a hill and three rail road tracks apart from each other. We became reacquainted and were married in December, six months later. Then, the following January, I went to Adak, Alaska, unaccompanied for a year. We were newlyweds but separated. She had to finish college and I had to do a tour on the rock, which I



absolutely loved." Adak is an island that was once a big military complex during World War II and, up until recently, a naval installation. "I love that Godforsaken place! So pristine, and unlike anything I had ever seen in my life." Years later, when their two sons were teenagers, Dave and his family moved back to Adak and were stationed there for another three years. It was a wonderful time for all of them.

In 1973, when Dave was assigned to a facility in Fort Meade, Maryland, he worked with a technician in the same data processing systems maintenance shop, who was a Ham. Bill, N3DC, became Dave's "Elmer" and longtime friend. Together they would practice code during lunch breaks, and, in the evenings, Dave would go home and copy code. "Once I got past 10 words a minute, it was a piece of cake after that. That plateau of 10 words a minute, makes or breaks you. Since I didn't have to learn any electronics and neither did Bill, I went from Novice to Advanced in 2-3 months." When Dave and Bill mastered 20 words a minute, they went to the FCC Office in Washington, D.C. and passed the

Extra Class exam. All that practice helped because in order to pass the exam you had to copy code for 5 continuous minutes with only 4-5 errors or you didn't pass."

Guam was the next place Dave and his family were stationed. Six months after they arrived, Super Typhoon Pamela hit. Luckily Dave had shipped his Kenwood TS-520 in the Navy express shipment.



"The typhoon leveled everything. The only things left standing were stripped palm trees and any buildings that were made of concrete. Since the 520 also worked on 12 volts, after it stopped raining and the wind quit blowing, I took the 520 out of the back of the car, hooked a piece of wire to it and threw it up over a couple bushes and contacted a gateway on the island that was running traffic back to the Mainland. I ran traffic for the people in the apartment building we were staying at, who wanted to let their families on the Mainland know how they were. It was very rewarding." Dave's efforts earned him his next stripe and he made E-7 after that.

"After your tour ends, you have to tear down all your stuff and give away what you can't ship away. You pack up what remains, and with me, every time I change duty stations, I change hobbies. It's like walking through a doorway into another room." After Guam, Dave and his family were transferred to Winter Harbor, Maine. He had packed his ham radio gear into the shipping containers and put it away for the next 42 years. "The kids got older and I got into Little League, and Farm League, and blueberries, and fighting mosquitoes. I was raising my boys." After their stay in Maine, Dave and his family transferred back to Adak for the next three years, and then from there, they were stationed for three years at Skaggs Island, in Vallejo. At the end of their tour there, Dave had 23 years in the Navy and he retired.



When I asked Dave how he found his way up here to Tuolumne County, he said that he had Mary Kay Cosmetics to thank for that. His wife was involved with Mary Kay and she had a friend whose husband was formerly a head hunter for tech people. When her friend's husband found out what Dave did in the Navy, he offered him a job. He said he had a little two man company that would go to the sites in the East Bay Area to repair equipment in the paper mills and other things of that nature. Dave signed on with them and worked for the first time at a paper mill. Following that he traveled with them to repair the geothermal units in Middletown. "After that overhaul was over, I had never been in a power plant before and I was totally fascinated. I was so fascinated, I thought, 'I want to be one of these.'"

When Dave was approached by the plant manager asking if he would stay on assisting as a plant electrician, he enthusiastically agreed. "I went to work helping that power plant electrician for the next 6 months. When the electrician decided he wanted to take a sabbatical, his boss said, "Well John, if you can find a replacement you can go." John said. " Dave's been working with me for 6 months and

he knows the plant as well as I do." So I was now the plant electrician. Now keep in mind I had only been doing this work for 6 months." After the geothermal job ended, it turns out that the Northern California power agency hydroelectric plant at the bottom of Camp 9, was in need of an overhaul. Dave moved on to Hydro Electric Power Generation working as a SCADA (Supervisory Control and Data Acquisition) VHF & Microwave Systems Maintenance Communications Technician.



Almost like dominoes falling, each new job presented Dave with new opportunities to learn new things and strengthen, even further, his skills and capabilities as an electrical technician." Because long, long ago, I learned that a resistor is a resistor, a capacitor is a capacitor, and a coil is a coil. Everything is built from basics. If you understand the basics, it's just a bigger assemblage of them - it just grows. You take it all apart, you're down to those 3 or 4 little components, and it all works off of those principles. Whether it's an RF generator or an AC power line generator, it all works the same way. Magnetism is

magnetism, control is control, a watt is a watt, and an amp is an amp. Break it down to the principles and you got it. That way you only have 3 or 4 things to remember. That's how it all works."

When Dave and his wife moved up here to Murphy's, he pulled out his ham radio equipment after many, many years. He was "gob-smacked" by all the changes in equipment capabilities, design specs, and the flood of technical information on the internet. After a few weeks of digging, he settled on a Xiegu-G90. While he has no favorite antenna per se, he did like the challenge of building a 10-meter high by 0.8 meter wide, 6 wire, Terminated Coaxial Cage Monopole (TCTM). Dave enjoys POTA (Parks on the Air), finding it interesting and fun. He also enjoys participating in the CARS 40-meter Monday morning Net, and checking in on the CARS, and TCARES, 2 meter nets. Occasionally he will "tune around during a contest to see if he can log a DX station." With regards to ham radio advice, Dave says, "I address all operators both young and old. Do what you love, and love what you do, because you get one chance at life. So give it all you've got, push yourself, grow in knowledge and have fun with it. If you like challenges, and an open door to more options than you ever imagined, then you're on the right path. Go for it!"



## 73, Ginger

*Ginger is a mom, a teacher, a student, a devoted partner, and a life-long learner. Her interests are many and center around service, communication, leadership, and integrity. She recently completed a Masters of Science in Counseling. She is open to challenging herself to learn and grow and in facilitating that in others. Ginger shares a love of Geology and the natural world around her with her partner, Jeff, N6JWT, and enjoys hiking and exploring the outdoors. Her interest in Ham radio stems from a desire to join others in learning, to be of service, and to continue to improve her communication skills on the air.*

# TCARES Breakfast Meeting POTA Program Presentation May 23, 2026

## Parks on the Air (POTA)



## USFS Elizabeth Peak POTA Activation



## USFS Elizabeth Peak POTA Activation



TCARES Participants included: Andrew (K6AEF), George (N6GEO), Mike (KM6YJP), Ginger (KM6RFT), and Jeff (N6JWT).

## POTA Member Webpage

**K6AEF**  
Andrew Firestone  
Tuolumne County, California  
Other call signs:

All-Time Statistics	
Activator	Hunter
Activations: 6/7	---
Parks: 2/3	1/5
QSOs: 85/91	144

**Awards**

- Stroke Hunter
- Silver Hunter
- Gold Hunter
- Platinum Hunter
- Diamond Hunter
- Sapphire Hunter

## POTA Park Page

**Tuolumne National Wild and Scenic River**

Reference: 090384  
 Country: United States of America  
 Location: US-CA  
 Lat/Long: 37.4375, -120.082 (37°26'15"N, 120°04'55"W)  
 Lat/Long (Short): 37.4375, -120.082  
 Lat/Long (Short): 37.4375, -120.082  
 Website: <https://www.nps.gov/tnwr/>

Access Method: **None**  
 Activation Method: **None**  
 Status: **ACTIVE**

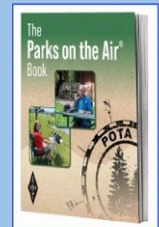
Established: **1968** on 04-19-61  
 Size: **74,000** (74,000) (74,000)

Park Leaders	
Activator	Hunter
1. <b>K6AEF</b> 2	<b>N6GEO</b> 102
2. <b>N6JWT</b> 2	<b>KM6RFT</b> 67
3. <b>KM6YJP</b> 1	<b>N6JWT</b> 2
4. <b>N6JWT</b> 1	<b>KM6RFT</b> 1

## Resources

Parks on the Air: [parksontheair.com](http://parksontheair.com)

POTA Website: <https://pota.app/>



# Repeater Coordinator Notebook

By [Greg Triplett](#)  
**WA6HNA/WRZS966**



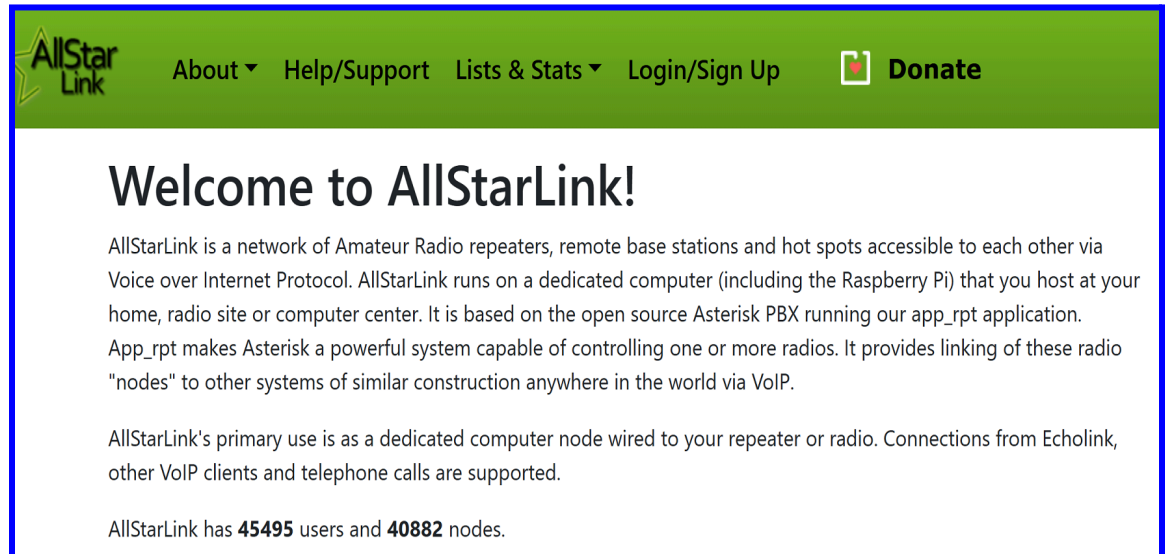
## TCARES Repeater System Status Q3 2026

Our repeater system is now over 6 years old, and like a 6 year old car, it sometimes needs both an oil change *AND* a tire change... And also, it might be time to finally fix that dent in the fender! So today, I'm going to do something I've done professionally many times, which is to produce a bug list. Here goes... things are getting busy!

## The TCARES Silicon Valley (SV) AllStarLink Server

1) Sometimes the AllStarLink (ASL) Server stops updating its list of all the other ASL nodes it can connect to. This leads to the server not allowing other ASL nodes to connect to our system, (think of N6LAW trying to check in from Oklahoma). The fix is to update to the latest ASL software, as the bug has been fixed in the most recent release.

2) Install a VPN (Virtual Private Network) on the server (see Duckwall section #3, below).



The screenshot shows the AllStarLink website homepage. The header is green with the AllStarLink logo on the left and navigation links: About, Help/Support, Lists & Stats, Login/Sign Up, and a Donate button with a heart icon. The main content area is white and features the heading "Welcome to AllStarLink!". Below the heading, there is a paragraph describing AllStarLink as a network of Amateur Radio repeaters, remote base stations, and hot spots accessible via Voice over Internet Protocol. It mentions that AllStarLink runs on a dedicated computer (including the Raspberry Pi) and is based on the open source Asterisk PBX. Another paragraph states that AllStarLink's primary use is as a dedicated computer node wired to a repeater or radio, and that connections from Echolink, other VoIP clients, and telephone calls are supported. At the bottom, it reports that AllStarLink has 45495 users and 40882 nodes.

## Duckwall Mountain

3) Recently we lost the ASL internet link between Duckwall and Columbia College. Investigation revealed that Conifer Communications had moved out of our radio vault, so was no longer able to provide us with internet access. Fortunately, our Duckwall site hosts are using a StarLink connection for their needs, and have offered us access to their connection. Due to the nature of StarLink, we need to install a VPN (Virtual Private Network) to establish a solid connection to our SV ASL Server (see Server section #2, above), requiring software acquisition, installation, and configuration. Once complete, our EchoLink, AllStarLink, and Duckwall/Columbia link should be restored.

4) While performing item #3, above, we will also update the Duckwall ASL Server to the latest Linux OS (operating system), and ASL software. There are a number of meaningful updates to the ASL software suite over the last 6 years.

5) Upon completion of item #3, above, we need to develop a system block diagram to provide our site host. The block diagram is the last requirement to complete a finalized contract between our site

host, the US Forest Service, and TCARES. With the contract in place, our continued access to Duckwall Mountain will be ensured. (Note: This is a *huge* benefit for our future!)

6) Since Conifer Communications is no longer in our radio vault, we will re-investigate our prior received radio interference from their equipment. If it appears the receive spectrum is now clear, we will change the repeater's transmitted PL tone back to 100Hz for a test period to evaluate if that is an option for us again. We will advise the club when the PL changes so you can change the received PL tone on your VHF radio to match the repeater's transmitted PL tone.

7) Replace the repeater controller's lithium memory & clock back up battery.

### **Moccasin Peak**

8) Recently our VHF repeater receiver lost sensitivity when the repeater warmed up during sustained use. The repeater was swapped out with the standing spare we've kept on hand for just this type of reason. So Moccasin is now working properly. The old repeater has been sent to a local land-mobile radio shop for repairs. If the repeater is not repairable, then we will need to purchase another VHF repeater to be our standing spare.

9) TCARES has been recently advised by our site host that all aspects of our installation, and site application package have been approved. Our contract with the site host and TCARES is being written at this time. With the contract, our continued access to Moccasin Peak will be ensured.

10) In the next few weeks, our site host will have a high-reach bucket truck at the repeater site and offer its availability to TCARES. We have accepted their generous offer, and plan to have their tower team inspect our Heliac cables, the antenna connections, and the antenna for good condition.

11) The Sunday Night North-Stake Emergency Communications Net has changed its net time from 8:30 PM to 6:30 PM. The repeater controller event timer will need to be changed to 6:30 PM.

12) Along with #11 above, the voice announcement for the Sunday Night net needs to be changed to reflect the time change, and an error (it says "North State", which should be "North Stake"). This will require an update to our custom voice library, as well as new script coding.

13) We have noted possible repeater jamming on some of our nets. This is under investigation.

14) Replace the repeater controller's lithium memory & clock back up battery.

### **Pinecrest**

15) Recently Pinecrest went off line after a sustained power outage. A site visit revealed it needed to be plugged back in!

16) During the site visit, we noted that the battery charger had failed. We need to acquire a new one, and replace it at the next visit, and confirm the batteries are charging properly.

17) Our antenna is extremely old. We have determined a replacement plan which should be able to survive the hurricane level winds (literally true) which occur at that site. We are purchasing a set of 2-dipole phased, collinear, elements to be attached to a very substantial aluminum mast.

18) When updating the antenna, we will also update the coax feed line to 1/2" Heliac cable. We have the cable and connectors ready at this time.

19) Replace the repeater controller's lithium memory & clock back up battery.

## Columbia College

20) Columbia College repeater has been performing quite well, thanks to the support of John, KN6RLM, and Jeff, N6JWT, providing routine maintenance, including resetting the ground-fault interrupter (GFI) breaker after the passage of a lighting storm!


21) Update the Columbia ASL Server with the latest Linux OS, and ASL Software.

22) Replace the repeater controller's lithium memory & clock back up battery.

## Temporary Work-Arounds

23) I'm currently working on re-establishing Duckwall's EchoLink/AllStarLink/Columbia College access via a UHF link from my house up to Duckwall Mountain. This will be in use until we are able to establish a reliable link via StarLink.

*Greg is the TCARES Repeater Coordinator & K6TUO FCC Trustee. He was a senior hardware engineer at Google (now retired), who specialized in FPGA (Field Programmable Gate Array) design for high-speed digital circuits and systems in the networking, data communications, storage area networking, wireless, and RF industries. Additional industry experience was in test & measurement, telecommunications, satellite TV, security, military, and aviation.*

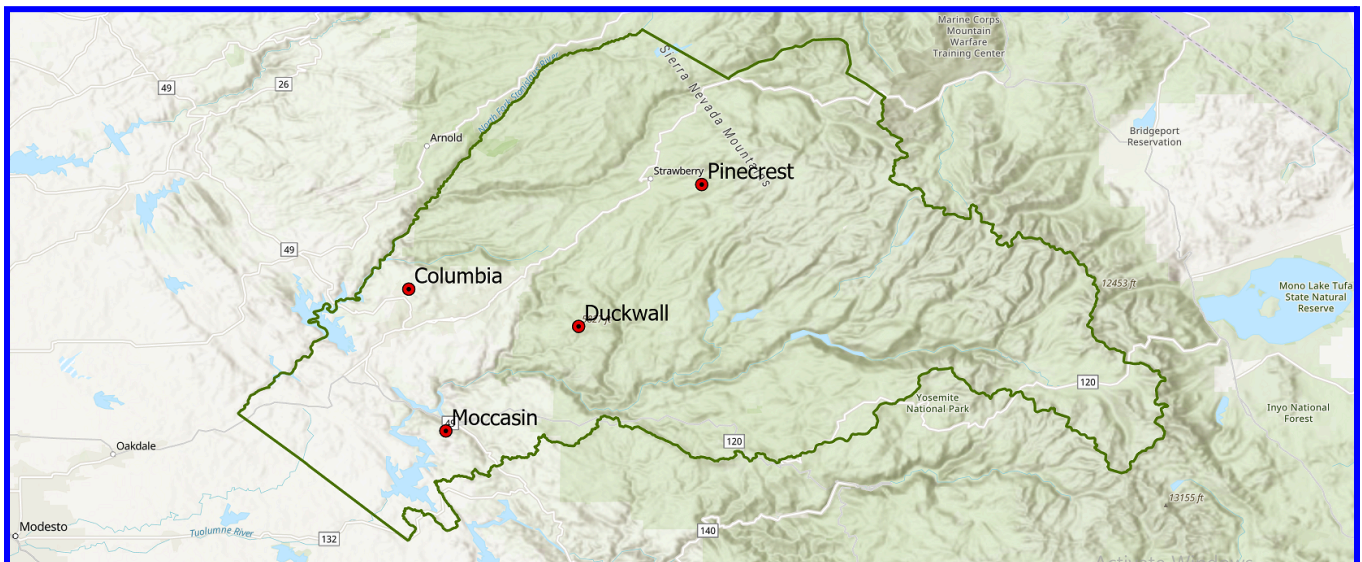


**Hetch Hetchy  
Regional Water System**  
Services of the San Francisco Public Utilities Commission

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BE DISCARDED

### PROJECT REVIEW APPLICATION/ APPLICATION TO USE SFPUC LAND OUTSIDE SAN FRANCISCO

**Application Instructions:** The San Francisco Public Utilities Commission (SFPUC) owns land for its own exclusive use and does not allow access or use without a successful application. Please complete this form if you are looking to install facilities, landscaping, infrastructure or use SFPUC land (The Right-of-Way or "ROW"), for parking, long-term access, or any other uses. After completing the application, you may need to submit additional documents and obtain multi-departmental approvals. An SFPUC staff member will guide you through the process.



# TCARES Club Breakfast Meeting May 23, 2026



# ARES/RACES Emergency Communications Report

By [Ned Sudduth](#)

**K6NED/WRPM781**



## Comms Trailer used in the Jamestown Run

[Editor's Note: I submitted this brief summary for Ned.] Ned, K6NED, coordinated with the Tuolumne County Office of Emergency Services (OES) to help run the **"ANNUAL SIREN & EVERBRIDGE ALERT TEST"** at 11:00 am, on Thursday May 14th. The county currently has sirens in Groveland, Twain Harte, Tuolumne, Cold Springs and Strawberry and TCARES members are asked to radio in audio reports to Ned, the NCO (net control operator), who was stationed at the county OES emergency

operations center, on Stryker Ct. Report locations are typically mapped and the data is analyzed, and presented to decision-makers for future emergency planning. TCARES has been involved with this event for the past couple of years, each spring, and we help with the Great ShakeOut emergency test during the 3rd week of October. We also continue to participate with the ARRL San Joaquin Valley section's "Perfect Storm" emergency training session, when asked.

Ned also shared that there is currently a reorganization happening at the Tuolumne County Office of Emergency Services (OES), with personnel changes. TCARES has had a good, positive relationship with past OES coordinators Dori Bietz, and Liz Peterson. The club is looking forward to working with the incoming coordinator, who Ned has connections with. He will keep up apprised of the changes as they occur.

Thanks to all the TCARES volunteers, who keep ARES and RACES running!

*Ned is the TCARES Webmaster (<http://www.tcares.net>), as well as the club's ARES/RACES Coordinator. He was previously KM6EAC, then N4NED, and is now K6NED. He has achieved the following awards: Grid Squared; United States Counties; World Counties; and World Radio Friendship. He served in the U.S. Navy (PlankOwner USS Essex LHD 2) and he and his wife, Toni, K6TNI, live in Sonora.*

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## Tuolumne County Emergency Alerts Testing

### May 14, 2026

**Tuolumne County Emergency Alerts Testing**  
Thursday May 14th, 2026 at 11:00 am

Everbridge Emergency Alert Notification and existing Outdoor Audible Alerts (sirens) will be tested at the same time.

**EMERGENCY ALERTS**  
powered by  
**everbridge**

Tuolumne County uses Everbridge as system to notify residents and visitors of an emergency through cell phone texts, emails and or landlines. We will be testing the system on May 14th at 11:00 am. If you are not already signed up, please visit:  
<https://www.tuolumnecounty.ca.gov/1170/Emergency-Alerts>


Tuolumne County has now incorporated outdoor audible alerts or sirens to our emergency alert notification system. This is another tool for getting emergency alerts out into the community.

These outdoor sirens are located in the following five communities: Groveland, Tuolumne, Twain Harte, Cold Springs and Strawberry.

Tuolumne County Sheriff's office will activate the sirens at the same time (or shortly thereafter) that the Everbridge Alert is issued.

During this test **DO NOT CALL 9-1-1** unless it is an emergency.

Tuolumne County Public Information line will be open to ask questions or take feedback on the day of test.  
**209-533-5151**



To participate in a survey about the sirens, please visit  
<https://arcg.is/1HfKCl1> or click on the QR Code

Are you a radio operator in the field?

Yes

No

# TCARES Club Breakfast Meeting June 20, 2026

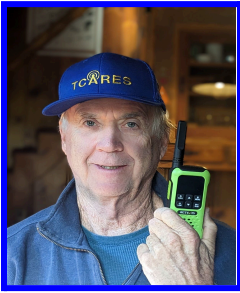


From left to right: Ginger, KM6RFT, Tim, KO6LLM, Larry, K6LMM, Mark, KG7BOG, Tom, KO6LXG, Charlie, N6CFH, Phil, WB6GGY, Greg, WA6HNA, and George, N6GEO. Photo taken by Jeff, N6JWT.

# Sparkie's Corner

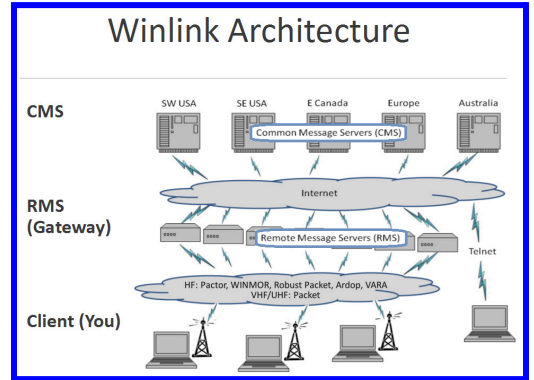
By [Rich Combs](#)

**KK6RIC/WRMM317**



## New RMS Gateways in Strawberry!

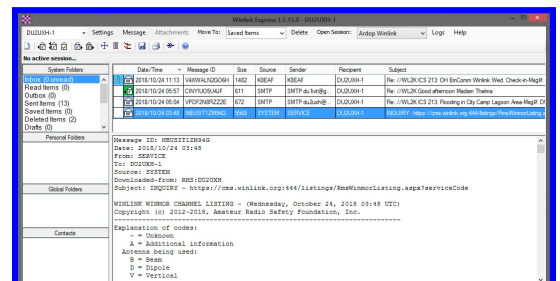
By the time this newsletter goes out summer will have arrived. Not only that but two new RMS Gateways will also have arrived up the hill in the Strawberry-Pinecrest-Cold Springs area. Along with the GMR repeater on top of Strawberry peak, it's starting to feel like the Pinecrest Basin is finally moving into the 21st century.



The two RMS (Remote Message Server) Gateways will allow the use of Winlink, and other packet-based programs, 24/7. The installations will have battery backup for short outages, and generator power for longer outages. They will be VHF initially, but we may add UHF in the future. They will probably be lonely, as there are only a handful of Hams operating in the area, but they provide a platform for EmComm exercises, and will hopefully encourage more participation of Hams in the area.

One or both of the systems will be operational for **Field Day**, where we will be giving another **class training presentation** on how to use Winlink. This time the emphasis will be on having each attendee send a Winlink message, or request one of the many reports such as weather, propagation, auroras, and more. We can take you from the beginning, downloading and setting up Winlink from Winlink.org and what you need - or don't need - through to sending a message.

The RMS stations are provided by Greg Kiyoi, KN6RUQ, and Rich Combs, KK6RIC. Greg's station, KN6RUQ-8, at 144.910 MHz, is in Summerhill, very close to the Pinecrest Expedition School, where we will be having Field Day. Rich's station, KK6RIC-10, at 145.610 MHz, is behind the Strawberry store in Strawberry. They both will show up in the channel selection menu when you open a session.



Hope to hear from you!

73, Rich

*I passed my Technician and General licenses in February, 2020 and Extra in September 2021. (I'm good at taking tests; I need to work on working a radio!) Main QTH = Livermore, CA, USA, (CM97). I'm relatively new to the radio world! Member of LARK (Livermore Amateur Radio Klub), and TCARES (Tuolumne County Amateur Radio Electronics Society). My alternate QTH = Strawberry, CA (CM98). As of 10/2021, I'm now working on CW via CW Academy. I passed the Beginner level in October, 2020, and I passed the Basic level in March 2022. I got interested in HAM radio to improve emergency communications for the Strawberry Volunteer Fire Department in 2019. I have gotten in way over my head since then! I have enjoyed building a few kits from QRPme and QRPguys. I have been developing a Neighborhood Radio Watch (NRW) program in Tuolumne County, modeled on one in El Dorado County, CA, USA.*

# Tuolumne County GMRS

By [Marc Colton](#)  
**N6NEZ/WRME405**



## Tuolumne County GMRS Community Update

We are changing the ham repeater on Cedar Ridge to a Yaesu Fusion Digital Repeater. The C4FM format has great audio quality! It will work in analog or digital mode. And Digital can talk to an analog radio and vice versa. There will also be available the capability to access the Yaesu wires-x nodes and reflectors for world wide coverage. I would be happy to put together a technical article for the next newsletter. The repeater is already programmed and tested, just need a trip up to the repeater site for installation. I hope to have this done in the next couple of weeks.

Again, you could make the announcement with more information to follow. You could direct questions to me. Also a digital repeater in Tuolumne County is a chance for TCARES members to have something new to experience.

### Yaesu DR-2X 144/430 Dual Band Dual Mode C4FM/FM Analog/Digital Repeater DR-2X



Also we have approval to relocate the GMRS Repeater antenna on Moccasin peak to the top of the tower close to the TCARES antenna. This will increase coverage for that site dramatically. The new antenna and feed line is purchased and also ready for installation which will be coordinated with Hetch Hetchy within the next few weeks, too.

**[Editor's Note: The Tuolumne County GMRS repeater system consists of 6 GMRS repeaters: 1) Hobby Hill (Columbia); 2) Moccasin Peak; 3) Vernal Ridge (Groveland); 4) Cedar Ridge; 5) Duckwall Mtn; and 6) Strawberry Peak. Marc, N6NEZ/WRME405, Chris, K6CDP/WRPX768, and Greg, WA6HNA/WRZS966, continue to maintain the system. Without their efforts, the GMRS repeaters would not exist. This repeater system continues to be integrated with the TCARES 2 m repeater system for emergency, and other communications uses. The club and community thank all three of you for all of your efforts! For more information, go to the Tuolumne County GMRS Repeater System home page at the following website: <https://tuolumnecountygmrs.weebly.com/>. All GMRS repeaters functioned well throughout the winter and spring storms, providing excellent communications within the greater Tuolumne County area. Well done Marc, Chris, and Greg!**

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Marc has been interested in two-way radio since college when he earned his Amateur Radio License. He worked in the two-way radio field for most of his career and has seen many advancements in radio technology. He's currently enjoying helping Tuolumne County volunteers put together a robust GMRS radio system. Through the informal Neighborhood Radio Watch (NRW) program, citizens should be better prepared to help each other in the event of a natural disaster, loss of power, or loss of cell phone service, which can happen to residents in our County.

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# Tech Talk: Beyond the Basics

By [Dave Arrich](#)  
**AD6AE**

## VHF/UHF Yagi Antennas: Design, Build and Tune a Top Performer

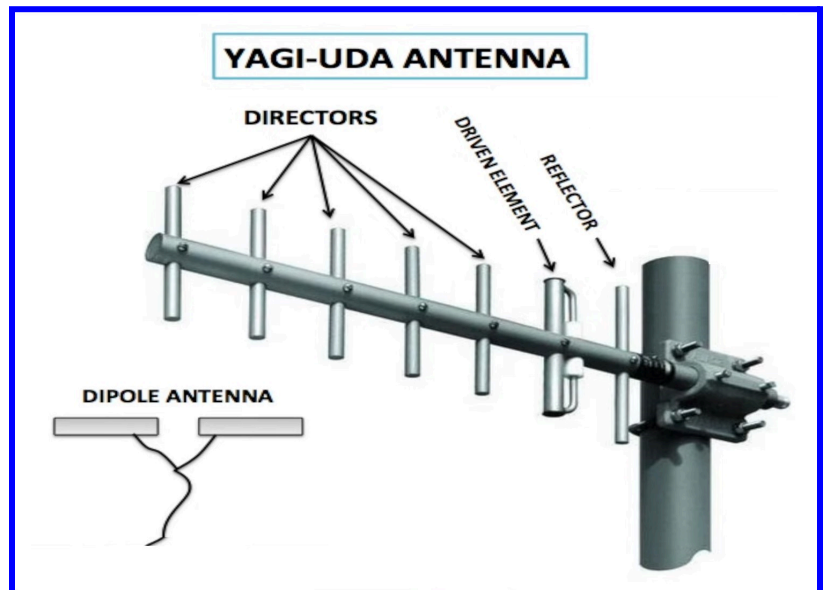
*"All complex antennas begin as humble dipoles." D. Arrich*



Many Yagi designs are available in the online community. They look good on paper, but fall apart in the real world. Some are properly designed; few are properly tuned. Rarely do they include actual test results.

There are right and wrong ways to build and tune a Yagi. There's no better way to learn antenna idiosyncrasies, than by building and tuning your own. With that comes a feeling of accomplishment; pride in workmanship; skill development, and a better understanding of how parasitic beam antennas actually behave.

Three types of driven elements (DEs) may be used with near equal results because tuning dominates performance more than DE design: 1) split; 2) folded; or 3) half-folded dipoles. Element shapes are usually round but, depending on design, may be rectangular. Cross section affects bandwidth which is why some builders use rectangular tubing. Element positions will vary slightly. However, tuning techniques remain the same. When using correct tuning methods, building materials can vary widely and give near identical results. (See Note 1 below.)



### BUILD OPTIONS:

- Split, folded or half-folded dipole: [VHF/UHF Yagi Antenna Quick Designer - K7MEM](#).
- Square, rectangular or flattened elements: ([DL6WU Yagi-Uda antenna online calculator - 3G-aerial](#)).
- Folded Dipole Driven Element: [Folded Dipole Design - K7MEM](#).
- Clear illustration of a Half-folded dipole: [VE3CVG Antenna Pages - Cheap Yagis](#)
- WA5VJB's designs are tolerant of build and environmental variations: <http://www.wa5vjb.com/references.html>.
- His full article download: [cheapyagi.pdf](#).

## SUGGESTED GUIDELINES for BUILDING and TUNING

1. Identify the center frequency, then approach it as a '**system**.'
2. The higher the frequency, the more precision required of layout and trimming.
3. Decide on a design, boom and element materials, and mounting method.
4. Keep element lengths and locations on the boom to  $\pm 2$  mm ( $\approx 3/32$ "") for VHF and  $\pm 1$  mm ( $\approx 1/16$ "") for UHF.
5. Tuning: Antenna Analyzer, or NanoVNA set to display LogMag, R and X, calibrated to the reference plane.
6. Reference plane: The far end of a 2-3 meter long cable with a 2-3 turn, mix 61 CM choke added.

## PROCEDURE

1. Cut elements; form the DE if folded; layout element positions on the boom.
2. Mount **only** the DE; place the boom on a stand to elevate it 6-feet high, pointing straight up.
3. Measure then trim the Driven Element for  $X \approx 0$  (R may be close to  $50\Omega$ ; ignore R).
4. **EXCEPT** the **Reflector, D1** and *optionally, D2*, Permanently mount all elements.
5. Temporarily, mount the Reflector, D1 and D2 in their respective locations; these are the tuning dials.
6. The resonant frequency will shift below the design frequency. **DO NOT** trim any elements! Mutual coupling has made the antenna capacitive;  $R \approx 40-70\Omega$ ;  $X =$  a negative value (See Note 2 below.);  $VSWR > 2$ .
7. An antenna is a **mutually dependent system** and tuned accordingly. Changes in any element will affect the others.
8. Reflector position affects inductance (coarse adjustment).
9. D1 position affects capacitance (fine adjustment).
10. D2 position affects capacitance (micro adjustment).
11. **For all three elements:** Closer to the DE = more; further from the DE = less.
12. Using the relationships in Steps 8-10, proceed as follows: With the analyzer connected and the antenna mounted, pointing skyward; alternate changing the Reflector first then D1 in small increments while observing R and X; repeat to zero in. **Targets:**  $R \approx 50$ ;  $|X| \approx 0$ . **Note** that once the VSWR lands at  $\leq 1.2$ , making further adjustments using D2 becomes optional.
13. Mark the new locations for R, D1, and D2 and permanently mount them.
14. Different heights and surroundings will impact the isolated readings somewhat. That's normal and of little concern.

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### Notes:

1. A reliable "Quick Yagi Designer" posted by K7MEM (SK), uses DL6WU criteria. His designs balance gain, bandwidth, and detuning immunity. K7MEM's Folded Dipole Design: There's no '*calculate*' button. Enter values, click anywhere to update "L".
2. Some analyzers, and all VNA's, will show a sign for "X". Ignore it. Look for a reading that's close to  $X=0$ .

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"The best way to understanding is by a few good examples." ~ Isaac Newton

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Dave's lifelong electronics journey began dramatically at age 4, causing a farmhouse blackout, and then a "shocking encounter" at age 8, sparked more intense curiosity. Self-taught through correspondence and mentoring, he was running a radio/TV repair service by age 14. In 1965, he earned an FCC First-Class Ticket with Radar Endorsement, leading to a role at GE (General Electric), testing Apollo program components. In 1967, Dave joined the Navy, serving 23 years as a Communications Technician, maintaining complex HF systems within a Wullenweber Antenna array. During a 1974 NSA (National Security Agency) assignment, he obtained his ham radio Extra Class license, actively engaging in DXing, contesting, and getting his code speed up to 20 wpm, before a 42-year hiatus. Post-Navy, he spent two decades with the NCPA (Northern California Power Agency), first as a geothermal electrician based out of Middletown, and Roseville, then as a SCADA (Supervisory Control and Data Acquisition) technician for a hydroelectric plant in Murphys. Three years ago, he reignited his passion for ham radio, delving back into antenna and transmission line theory.

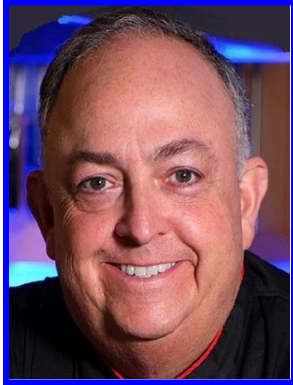
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## Columbia Airport Father's Day Fly-In June 20, 2026



# Guest Column

By [Jay Goldberg](#)  
**KB6ENY/WSHT470**



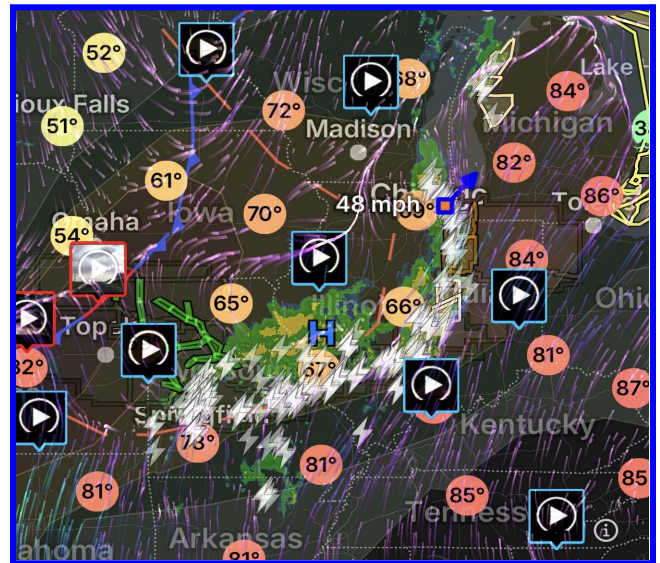
## The Impact of Severe Terrestrial Weather on HF Radio Communications and POTA Operations

[Editor's Note: Jay agreed to write this guest piece for the club newsletter - enjoy!]

While amateur radio operators routinely monitor solar activity, space weather is only half of the equation. Terrestrial weather—specifically massive, severe thunderstorm complexes—exerts a profound, immediate influence on High Frequency (HF) propagation and localized noise floors. For Parks on the Air (POTA) activators and hunters alike, understanding the relationship between severe weather systems and radio frequency interference is crucial for anticipating band conditions.

When severe weather systems break out across major geographic regions, such as the American Midwest, the electromagnetic disruptions are felt nationwide. Operators on the West Coast routinely witness their waterfalls plagued by distant electrical discharges, while operators within the storm zones find weak signals completely drowned out. Unlike space weather phenomena which can last for days, terrestrial thunderstorm systems create highly dynamic, severe conditions that fluctuate over an 8-to-12-hour timeframe.

*Figure 1: Severe thunderstorm systems act as massive, regional radio frequency interference generators across the HF spectrum.*



## Primary Mechanisms of Atmospheric Radio Interference

### 1. Atmospheric Noise and "Crash" Static (QRN)

The most immediate and severe impact of a localized or regional lightning storm is an aggressive spike in atmospheric noise, universally classified as QRN. Every individual lightning strike operates as a massive, high-powered, completely uncontrolled spark-gap transmitter. These discharges dump an immense burst of raw radio frequency (RF) energy across an incredibly wide spectrum, heavily concentrated throughout the Low Frequency (LF), Medium Frequency (MF), and High Frequency (HF) bands.

On an HF receiver, this electromagnetic chaos manifests primarily in two ways:

- **Static Crashes:** These are sharp, distinct, and high-amplitude acoustic pops or crashes that

register visually on software-defined radio (SDR) waterfalls and audibly in headphones. These bursts coincide precisely with physical lightning flashes and can easily peg an S-meter, completely masking weak signals.

- Elevated White Noise Floor:** When an active, severe front or a large mesoscale convective complex develops—even at distances spanning 1,000 miles or more—the combined electromagnetic output of thousands of continuous, distant strikes merges into a dense, non-stop rushing or hissing background noise. This elevates the overall noise floor across entire regions.

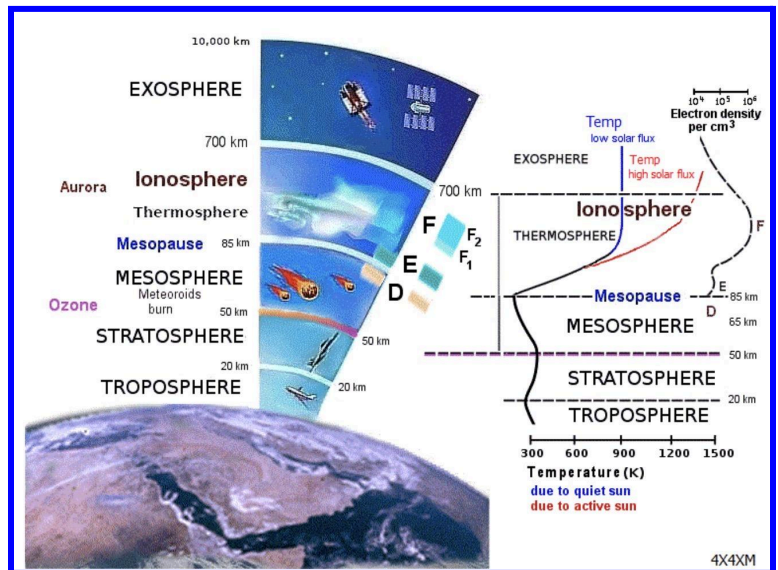


Figure 2: Diagram of the Structure and Layers of the Earth's Atmosphere.

## 2. Upper Atmospheric and Ionospheric Disturbance

Lightning is not merely a ground-ward phenomenon; it fires massive amounts of energy upward into the upper atmosphere. These intense electromagnetic pulses (EMPs) can temporarily alter the delicate ionization levels of the D and E layers of the ionosphere, disrupting the very mediums required for long-distance HF.

- Sprites and Mesospheric Alterations:** Sprites are large-scale, upper-atmospheric electrical discharges that occur high above active thunderstorms, typically reaching altitudes ranging from 50 km to 90 km (30 to 55 miles) within the mesosphere. Spanning up to 40 km in both height and width, these massive transient luminous events create localized atmospheric ionization anomalies that wreak havoc on standard RF signal reflection paths.
- Signal Absorption:** Intense local lightning can trigger sudden, minor increases in D-layer ionization. Because the day-time D-layer is primarily a signal absorber rather than a reflector, this heightened density leads to rapid, temporary attenuation (fading) of HF signals attempting to transit the storm region.

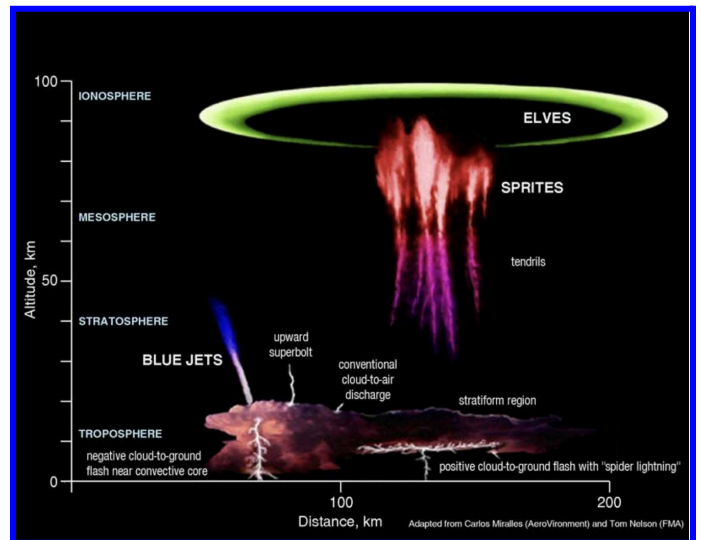


Figure 3: Transient luminous events like sprites expand vertically and horizontally in the mesosphere, disrupting regional ionospheric pathways.

- Whistlers and Tweaks:** Low-frequency electromagnetic components of a lightning strike can escape into the magnetosphere, traveling along the Earth's geomagnetic field lines. This gives

rise to "whistlers" and "tweeks"—strange, descending audio tones and artifacts on very low frequencies that can cross-modulate or bleed into upper HF monitoring equipment.

### 3. Precipitation Static (P-Static)

Direct lightning strikes are not required to generate severe interference. The physical movement of storm clouds, heavy precipitation (hail cores), and intense wind can rapidly charge an amateur's physical antenna infrastructure.

As wind, rain, snow, or high-velocity dust particles charged with static electricity collide directly with an exposed HF antenna element, they transfer that electrostatic charge directly onto the wire or aluminum structure. This results in Precipitation Static (P-Static), which manifests as a loud, continuous, and steady whining or roaring sound. P-Static frequently builds in intensity until the voltage completely desensitizes or blinds the receiver, discharging only when safely routed through a dedicated DC-ground path or when it physically arcs across an air gap.

Amateur Bands	Disruption Level	Primary Characteristics & Effects
160m – 40m	<b>Extreme</b>	ive static crashes dominate; background floor is heavily elevated by distant regional is up to 1,000+ miles away. Weak signals are letely masked.
20m	<b>High</b>	ent waterfall tracing of lightning bursts; icant regional fading and localized signal ption via altered D/E layer ionization profiles.
15m – 10m	<b>Moderate</b>	usceptible to long-distance lightning ound noise, but highly vulnerable to localized tation static (P-Static) from moving storm and active rain/hail cores.

### Summary of Terrestrial Weather Impact by HF Band

Because different frequencies interact uniquely with atmospheric layers, the disruptive effects of major convective weather systems vary significantly across the amateur radio bands:

### Observational Survey: Real-Time Band Reports

Correlating national weather maps with actual radio operations uncovers clear, predictable patterns in HF propagation. With significant severe weather systems generating intense storm cells, tornadoes, and large hail across the central United States, operators have an immediate opportunity to observe these phenomena firsthand.

To gather real-world data on how these massive convective complexes are currently altering the bands, please share your operational observations with KB6ENY ([ukulelejaybbq@gmail.com](mailto:ukulelejaybbq@gmail.com)):

- **Operator Location:** [City, State/Grid Square]
- **Observed Band(s):** [e.g., 40m, 20m, 10m]
- **Interference Type:** [Static Crashes/Elevated Noise Floor/P-Static/Severe Fading]
- **S-Meter Impact:** [Average background S-level or peak crash level]
- **Additional Notes:** [Current local weather conditions, or specific impact on POTA activations/hunts]

Thank you for contributing your observations to this real-time overview of weather-induced band conditions.

73, Jay

*I started with ham radio in high school and playing around with crystal Radio Shack radios along with crystal scanners. I was in the fire service for several years as a volunteer firefighter, and retired from law enforcement in 1997 after a successful career. After graduating college, I graduated law school with my Juris Doctorate degree. I was a licensed pilot and master certified scuba diver for years and felt ham radio was a great complimentary skill on the land, in the air and on the water.*

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## Columbia Airport Fathers Day Fly-In, June 20, 2026

