

Ozark QRP Banner



The Official Newsletter of the Four State QRP Group WQ5RP

February 2022 Edition

In This Edition: Multi-Band HF Vertical Antenna, Picnic Table Portable Antenna, Fox Hunt Propagation Mapping, Four Days in May, Free EZNEC Antenna Software, OzarkCon, Charlie Brown and Me, Adventures in the Field, AF4K Crystals, A Practical Exercise in Antenna Modeling, Counting Turns on Small Toroids, Winter Field Day, St. Louis Winterfest

Get Ready for OzarkCon 2022 - April 8-9

OzarkCon Updates:

If you're planning on attending, please make your room reservations ASAP. Tell the reservation person at the Stone Castle that you're with the 4SQR group to get the reduced price.

Look for registration to open mid-February 2022.

Motel Info: Stone Castle Hotel

3050 Green Mountain Drive - Branson, Missouri 65616 - Tel. 833-993-3837

Ozarkcon University will be held on Friday mid-day so plan on Arriving Thursday night or early Friday morning.

- The conference committee is currently searching for Speaker/Presenters. So, if you have a Topic for a presentation, please contact Johnny at ACOBQ@4sgrp.com

A big thank you to all of the contributors that helped with this edition.

You make the Banner a Success!

Multi-Band HF Vertical Dipole

On a Spiderbeam 12m HD Telescoping Fiberglass Pole

for: 80/40/30/20/17/15/12/10m

Total Height: 12m (40 ft.)

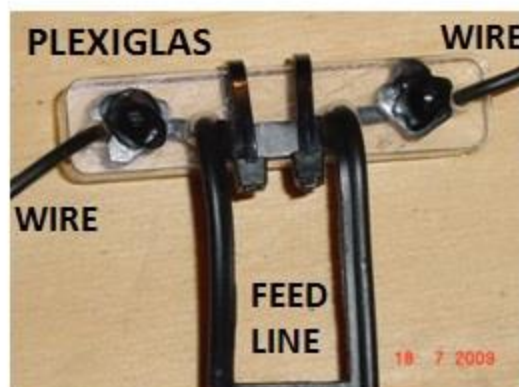
Wire: Spiderbeam CQ-532

(6m per side – total 12m long)

(20 ft. per side – total 40 ft. long)

Note: Spiral the radiator wire down the pole about one turn per meter.

Tip: tie a knot in the wire about 2cm (1 in.) before each end, then fasten the wire to the pole with electrical tape or a wire-tie. The knot prevents the wire from slipping back through the tape or wire-tie.



Simple lightweight insulator

Insulator will be about 6m (20 ft.) above ground. Fasten with wire-ties.

450Ω Openwire Feedline

Although the length is not critical, there are some lengths which can cause trouble. See text.

Guy Ropes:
2mm Kevlar

50cm (2 ft.) above ground

Guy stakes 5 to 7m away from pole.
(16 to 23 ft.)
spaced equal distance around the pole.
Or, use tree or fence to fasten ends.

CAUTION HV!
(HIGH VOLTAGE)

Good Antenna Matchbox

MFJ-974B*

* Alternatives described in text.

Spiraling the wire down the pole distributes its weight evenly around the pole and prevents it from flopping in the wind. Since the lower half of the pole is thicker (wider) than the upper half, the wire will end about 50cm above the ground.

IT IS IMPORTANT TO KEEP THE WIRE THIS DISTANCE FROM THE GROUND!

DOWNLOAD DETAILS AND INSTRUCTIONS:

Instructions for Simple Multi-Band Vertical

This PDF explains the antenna and has tips for its construction. There is also an appendix on Antenna Matchbox selection and another on Baluns, including how to build your own simple and effective balun for use with an Asymmetrical Matchbox.



[Simple Multi-Band Vertical Dipole.pdf](#)

PDF-Dokument [997.9 KB]

More info on this antenna and antenna matchboxes for it are found: [HERE](#)

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- AF4K Crystals by WD8DAS -



Steve Johnston, WD8DAS, has purchased AF4K Crystals and is again serving the crystal needs of hams and hobbyists.

There are two ways to order - the new online store and via email.

[Click here to visit the AF4K Crystals online store](#)

Or click the link below to send an email inquiry:



orders@af4k-crystals.com

Provided by K5EST

EZNEC Antenna Software by W7EL

EZNEC IS NO LONGER FOR SALE. IT IS FREE (see below)

EZNEC PRO/4 IS NO LONGER AVAILABLE (see below)

THERE WILL BE NO SUPPORT OR REFUNDS

The introduction of EZNEC Pro/2+ v. 7.0 has been unavoidably delayed. The estimated time of introduction is Jan. 14, 2022, but I'll do my very best to have it ready before then. It is now undergoing extensive testing and updating of the manual.

EZNEC Pro/2+ v. 7.0 will have all the features of EZNEC Pro/2 v. 6.0, plus extra features including wire loss for individual wires and the ability to run external NEC-4.2 and NEC-5 programs for calculation.

Until EZNEC Pro/2+ v. 7.0 is available, you can download EZNEC Pro/2 v. 6.0 by clicking here:

[Download EZNEC Pro/2 v. 6.0](#)

EZNEC Pro/4+

Use of EZNEC Pro/4 and EZNEC Pro/4+ require a license from Lawrence Livermore National Laboratory (LLNL) because of their incorporation of NEC-4.2 code for which LLNL retains the rights. Sale of EZNEC Pro/4 has required the purchaser to obtain a license before purchasing, and its use requires that a license be in force. As I will no longer be verifying the existence of a license, I can no longer distribute EZNEC Pro/4 except as upgrades to those whose licenses have previously been verified. EZNEC Pro/4+ will be made available at no charge to as many current users of EZNEC Pro/4 as possible, at the time EZNEC Pro/2+ becomes available. The procedure to obtain it will be detailed on this page.

NEC-4.2 calculations will be able to be done with EZNEC Pro/2+ v. 7.0 by purchasing an NEC-4.2 license from LLNL and running the supplied NEC-4.2 program with EZNEC Pro/2+ v. 7.0. The speed will be less than EZNEC Pro/4+ and some features are not available, but results will be very nearly identical. Both EZNEC Pro/2+ and EZNEC Pro/4+ will be able to do calculations with NEC-5, also available from LLNL. Not only is NEC-5 priced substantially lower than NEC-4.2 but it also has a number of advantages over NEC-4.2.

I want to thank the many people who have sent encouraging and complimentary messages about my retirement. I'm very sorry I haven't been able to respond because my time has been intensely taken up in getting the new EZNEC Pro+ programs ready. I'll attempt to respond individually after the programs have been released.

Watch this page for the EZNEC Pro/2+ and EZNEC Pro/4+ announcement and other updates!

***Roy Lewallen, W7EL
January 1, 2022***

A Picnic Table Portable (PTP) Vertical Antenna

By: Larry Naumann, nØsa

Some years ago, I started doing SOTA activations. The antenna I chose to use at the time was a 60 foot doublet fed with 300 ohm window line. This antenna utilized the ATU in my KX3. It worked just fine but required me to toss a line in a tree to pull up the center and then tie off each end for an inverted Vee configuration. I used this antenna for quite a few activations. Then, the end fed half wave hit the scene and I switched over to the EFHW. The EFHW was a bit easier to deploy and worked quite well. It also did not need an ATU to be used on my two favorite activation bands, 40 and 20 meters. Over time as I got older, I started to do more POTA activations, for obvious reasons. During this time, SOTA and POTA operations had grown quite a bit and highly efficient antennas became less of an issue. I found out that I could get by quite well with a shorter vertical and a few radials. I could still work a lot of stations in a short period of time and I spent much less time tossing lines in trees and more time actually making contacts. My first vertical used a camera tripod and a vertical element about 16 feet tall. It used a combination of screw together mast sections, an Air Dux tapped coil and a Buddipole's whip element. I used four 15 foot long radials tossed on the ground. This antenna worked well and I had no trouble working plenty of stations. But I wanted something even smaller and easier to deploy.

Reading Tom Witherspoon's K4SWL webpage (qrper.com) I found he has been using the Elecraft AX1 mini antenna with good results. As an aside, Tom's webpage is top notch. I decided to design a midsize antenna that could be easily deployed on a picnic table. Thus, the name PTP for picnic table portable. I decided on a total length of about 9 feet of vertical element. There is an adjustable loading coil roughly in the center with a short Buddipole whip on the top.



I made a small tripod base with screw in legs. All the sections screw together and they are all about 15 to 16" long. The sections are made with aluminum tent pole material made by Eastman. It is super strong and light. I installed brass ends with stainless steel screws. There is a main hub for the base that has a ring to hang a small weight on. This weight holds the antenna in place and is needed if it is windy.

I use a Super Antennas MP1C loading coil in the center of the antenna. This is a very nice adjustable coil on the same design as a screwdriver antenna but with manual

adjustment. I have no monetary interest in either Super Antennas or Buddipole but can attest to the quality of their products as far as the coil and whip goes. With the MP1C I can easily tune the antenna as needed. This particular design will easily tune 40 meters and up. Super Antennas supplies a plastic plate

with tuning marks on to use as a gauge to get you in the ballpark. It usually only takes a small adjustment to get the SWR below 2:1.

At the feedpoint I use a BNC connector and a small shunt inductor. On this antenna I use 13 turns on a T50-2 toroid. This is about 1uH. I am not going to go into designing a shunt coil in this article but if you go to the following webpage the particulars are all well described. <http://www.k0bg.com/match.html> With short verticals like this, the feedpoint resistance is usually below 50 ohms, closer to 25 ohms or less. With these low resistance values the best SWR you can achieve is close to 2:1. Which may not be too bad but when you go to tune it on say 40 meters, the sweet spot is very narrow and hard to find. The shunt loading lowers the SWR and makes it easier to get a good tune. This allows me to do away with the need for an ATU. My shunt coil is mounted under a plastic shroud for protection.



I use four radials that plug into crimp on bullet connectors mounted on the tripod hub. The radials are about 15' long and I just lay them out from the base.



I have used this antenna for quite a few activations and have always had very good results. It is great for POTA ops and will easily fit in a backpack for SOTA ops. I have used it with the base on the ground and on a picnic table with similar results.

In today's SOTA, POTA world, a killer antenna is not needed for a successful activation. There are so many chasers and with auto spotting added things are much easier today.

On another note, as I stated I have no connection with Super Antennas. <http://newsuperantenna.com/>

I use only their loading coil but they offer a full version of this basic antenna and a tripod. You can mix and match their parts with any system that uses 3/8"-24 threads.

All my portable operation is CW mode, mostly at 5 watts but every once in a while, I will crank it all the way up to 10 watts. If I were to operate these same locations with the same radio, antenna and power but not be a SOTA or POTA activation I would normally be lucky to make 5 to 10 contacts in a hour. But working a SOTA or POTA operation is a whole different ballgame. I then became the rare DX station that a lot of people want to contact. That is part of the fun of all of it.



Going to Hamvention? **FDIM Registration 2022**

Four Days In May (FDIM) - [QRP ARCI - FDIM](#)

MAY 19-22 2022

The biggest and best QRP event in the World!

Second to OzarkCon...

FDIM will be held at the same location as last time, Holiday Inn Fairborn.

Registration is open long before we have made final plans for programs and other activities at FDIM 2022. Details will be available on the [QRPARCI.org](#) web site as soon as they are completed.

If you have any questions or concerns, please send Norm an email.

Norm Schklar - WA4ZXV

Questions, contact fdim@qrparci.org

Register [HERE](#) for **[FDIM 2022](#)** now!

Charlie Brown and Me

By AG1P – Ron Potter

Believe it or not, Peanuts comic strip character Charlie Brown and I have something in common. Don't believe me? Well, it's true. Charlie has his kite-eating tree and I have my antenna-eating dune. His is make-believe but mine is very real. Here's the scoop.

I was spoiled with my 80-meter skywave loop antenna positioned high up in old oak trees, that is spoiled until family issues required my bride and me to relocate to the Oregon Coast. When I say "coast", I mean coast...as in within 300 yards of the water and surrounded by sand dunes. Once the boxes were emptied and furniture moved, I don't know how many times, I was ready for a break – time for some rest and play some radio. But I discovered there were a few problems. First, the loop I had so carefully removed had to remain in the box. There were no trees. I then discovered that there were very draconian homeowner association rules that would not permit me to put up my HF or VHF verticals. I decided to construct a 20-meter loop, attaching it to the inside of the garage. The results were disappointing. Like I said, I was spoiled.

I waited until the opportunity presented itself and then constructed a stealth dipole running along the peak of the roof using 18-gauge wire. It was difficult to see from the street, results were fair but better than the garage. Think some knowledgeable person once said that antennas need air. They were right and I was a happy camper. Happy, that is, until the first good late autumn storm hit. We sustained winds of 50-60 mph with gusts to 75. The white vinyl siding turned to adobe with the blowing sand and rain. Windows were covered and it felt like living in a cave. At the peak of the storm, signals disappeared. My antenna stopped working. Once the winds died down enough to get on the roof, I discovered the antenna was gone, stripped clean as a whistle off the roof.

I searched all around the near-by houses in hopes of finding it but to no avail. Two days later, I was driving to the post office and passed by a big, 40-ft high dune about a half mile from my house and saw a porcelain insulator attached to a wire sticking out of the sand. I stopped, jumped out of the car and checked it out. It was my antenna. An hour later, after much shoveling, and colorful language, the antenna pulled free. I never did find the center connector. I carefully coiled the wires and set them in the back seat. Clearly dipoles on the peak of the roof during winter storms could not survive Mother Nature's wrath.

Upon advice from some friendly 4SQRPers, I put the dipole back up; only this time it ran along the top of the gutter on the back of the house. I used the same wire; only this time used a center connector made from some Lexan stock I had left over from a prior project. I also used some wood strips and regular intervals to hold it in place. Convinced this would be the cure my problem, I got on with life and operating was halfway decent. Not as good as before but decent.

Two weeks later another storm announced its presence. This one really packed a punch; sustained winds of 70 mph and several gusts to 100 mph. Once again, the signals disappeared during the peak of the storm and never returned. Once the storm passed, it took me two days to clear the sand off the

driveway and decks. Finally, I got to the point I could get up to gutter to troubleshoot the antenna. The only sign that it ever existed was the 450-ohm ladder line wrapped around a downspout, the wires had broken at the plastic. Once again, I checked around the houses in the area to see if I could find the antenna, but to no avail. On my next trip into town, I checked along the road. Yep, you guessed it. When I came up to the big dune, there was the Lexan center connector and porcelain insulator protruding out of the sand. I performed the rescue a second time. I was getting good at digging things out of sand.



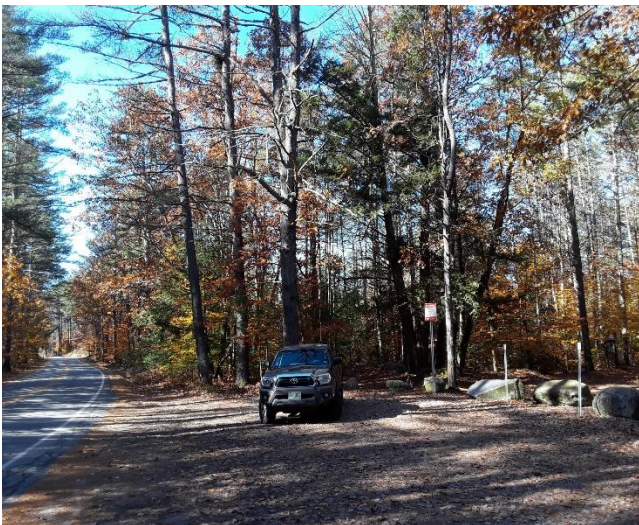
So, I have resigned myself to use the garage loop during the stormy months, then lay a skywave loop on the roof when conditions permit. Charlie Brown has his kite-eating tree and I have my antenna-eating dune. We both have learned to just live with them.

Epilogue

People say there is no justice. But once in a while we get a glimmer of hope. Last month bulldozers magically appeared and my antenna-eating dune is no more. I am guessing next spring a new home will be built. The question in my mind is if I put up another antenna over the winter, where will it end up - in the surf, carried out to sea, laying across a piece of driftwood and headed to parts unknown? Only time will tell.

'Adventures in the Field'

Over the past year, I've enjoyed taking part in the Parks on the Air (POTA) program. By way of background, it's now been about 3 years since I've tackled any 'Summits On The Air'. Here in the Northeast, there are scads of '1-point' summits. Those don't usually have any trails, and they're densely-forested. That means 'blow-downs' and they're tough going. On my last such bushwhack, I fell on the way down. A number of lacerations resulted, but no serious harm. I considered them 'badges of honor' but my wife didn't see it that way. I had to promise there'd be no more solo bushwhacks.



The Parks on the Air program has been a salvation. I've done 25 Activations over the past year. Most of those were within 30 miles of our home. In the warmer months, it was a matter of finding a place to park and

setting up a small folding table. In years gone by, I've slung a weighted line into a tree, but I was typically good for only 35 feet of height. I'm now using a homebrew pneumatic launcher- good for 80-90 feet at higher pressure. That's usually unnecessary.

I've settled on an arrangement that works well for me. I concentrate on 20 meters. I usually use a PAR 20M end-fed half-wave antenna- 33 feet in length and light weight, with only a single support line needed. When I'm on these outings, I'm running power- typically 60 Watts (don't tell anyone). I want to be heard! My activations run 1 hour and they're pretty intense. Modest pileups are the rule.

Although trees usually serve as antenna supports, that's not always the case. On open ground or at tree line at high elevation, a different approach is needed. In that case, I use a mast-mounted 1/4-wave vertical up 10-15 feet. It uses two quarter-wave radials- basically an 'inverted-Y'. The radials also provide reinforcement for the mast.

My 'high-water' mark for the year was an activation in our capitol city of Concord (NH). There's a surprising amount of forested land there. The attached image shows my setup there- a pullout for a state forest trailhead.

As luck would have it, there were no power lines on this stretch of road. In case it's not obvious from the picture, I backed up to a big dead pine. Over the course of an hour, I made 82 contacts including several dozen with Europe.

As the weather got colder late in the year, the outside table became more challenging. I switched to a small melamine-clad countertop on the passenger-side of the truck. It provides a comfortable working surface- more so than the table and chair outside. In good weather and with the leaves off the trees, there's plenty of solar gain. I haven't needed to run the engine for heat.



If you haven't tried the Parks on the Air program as an Activator, it's really worth giving it a go. It's been a real blast being the object of pileups! If that's a bridge too far, you can chase those Activators. Parksontheair.com has a web page showing who's currently active, and they're not hard to work. I respond to QRP stations when I'm in the field, and I work activators from the home shack at my customary 4-5 Watts.

73- Dave Benson, K1SWL

A Practical Exercise in Antenna Modelling

Jim Giammanco, N5IB

n5ib@juno.com

January 7 2022

For years I've had a simple 10 meter vertical antenna mounted on a length of PVC pipe just above the gable end of my roof. It was made from one of those truck-stop-sourced 102" stainless steel whip antennas designed for the 27 MHz band, trimmed down to resonate at the low end of 10 meters. Two radial wires did double duty as guys, and a doublet antenna for the lower bands attached a foot or so below served as guys in the other directions. It worked well enough to enjoy occasional 10 meter QRP operation.

Then last year along came **Winter Storm Uri** in February 2021 followed by **Hurricane Ida** in August. It left my long-suffering "vertical" antenna more "concept" than reality - dizzily bent over at a 45 degree angle. Who knew just a quarter inch of ice and 70 mph wind gusts would be such a problem! Repairs were certainly in order, and since the solar flux has been peeking over the 100 bar, it was a good time to get something ready for the upper bands.

I decided to try to salvage what I could of the hardware and make a simple antenna that would be usable on both the 12 meter and 10 meter bands. It had to maintain the same basic geometry, being constrained by the gable mounting and the need to serve as guy wires for the PVC mast that supported the wire antenna.

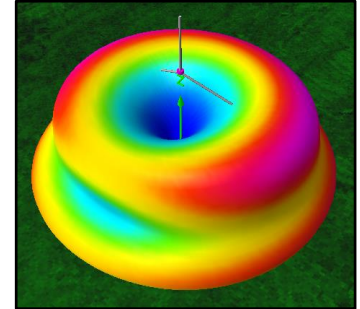
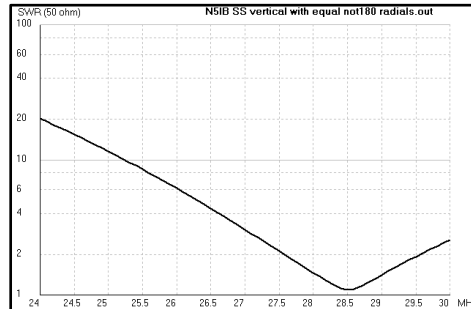
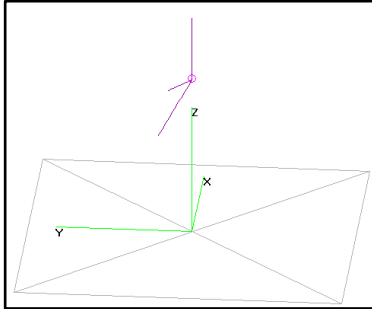
The basic idea was to use the same stainless-steel whip (I was actually able, with an anvil and ball-peen hammer, to bend it back to straight without breaking it) but to make the two radial wires of unequal length, hoping to get something that, if not actually resonant in both bands, would at least be an easy match for a tuner.

Being of an age where ladder climbing, raising and lowering masts, wire trimming and re-routing, etc., are inconvenient if not downright perilous, I wanted to minimize the amount of "hazardous duty."

Enter antenna modelling software, in my case the program is **4NEC2**, though **EZNEC** or others will do an equally good job. I planned to use the model to test whether my idea was completely nuts and, if it was not crazy, to obtain a good starting point for dimensions.

Note: 4NEC2 has always been a free, downloadable program <https://www.qsl.net/4nec2/> and, as of Jan 1 2022, with the retirement of Roy, W2EL, EZNEC is now free for download <https://www.eznec.com/>

First, I set out to model the existing arrangement to determine what its theoretical performance would be on 12 meters. The base of the vertical whip is about 19 feet above ground, and the two radial wires slope downwards at about a 30 degree angle. They are not 180 degrees apart, but rather form an angle of about 135 degrees to do double duty as guys. The figures below, from **4NEC2**, show the geometry and the expected SWR and pattern (at 28.5 MHz) performance.



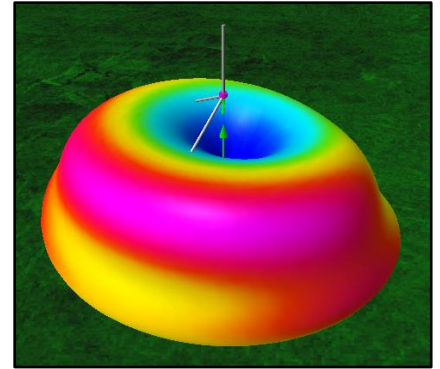
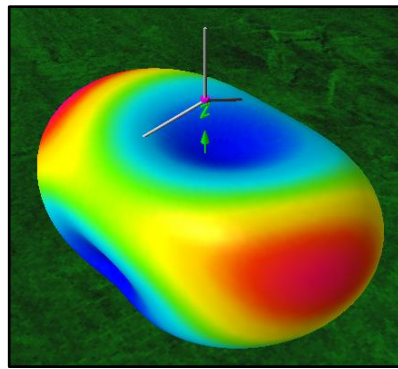
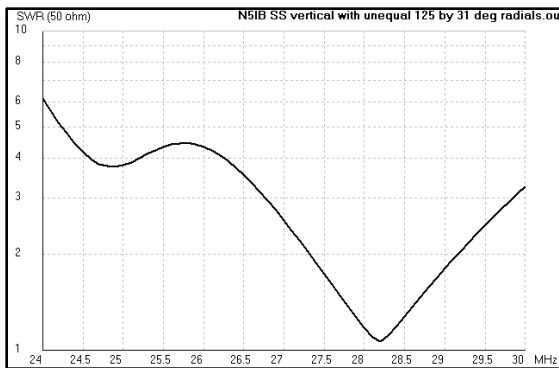
Notice that, while there is a nice SWR minimum in the 10 meter band, the match is very poor at 12 meters and could be a challenge for some tuners to accommodate. In actual operation the internal autotuner in my K2 was able to obtain a satisfactory match, but I thought it would be a good idea to not make it work quite so hard. There is also a little directivity in the direction favoring the radials. That is nearly southeast from my location in south Louisiana - OK for South America but not the best for USA. Unfortunately, that orientation is locked in by the layout of the house and roof.

The next step was to incrementally increase the length of one of the radials and see what effect that had on the SWR curve. In effect it would be as if a dipole antenna were bent at a point offset from the center. Recall that if you move the feedpoint of a resonant dipole antenna away from the midpoint you don't change the resonant frequency, but you will see an increase in the feedpoint impedance. Since a resonant quarter-wave wire over a ground plane has a resistive impedance somewhat less than 50 ohms, this offsetting of the feedpoint is a tool to obtain a better match to 50 ohms. After some "virtual cut-and-try" I arrived at a workable set of dimensions:

Vertical element:	2.48 m (97.6")
Radial #1:	2.70 m (106.3")
Radial #2:	3.17 m (124.8")
Radial droop angle:	31 degrees below horizontal
Horizontal separation angle:	125 degrees

It is rather like a "fan dipole" but bent in the middle, with the wires on one side the same length and twisted together. Strange beast, right? But a wise Elmer once told me "RF gotta go somewhere, and any antenna is better than no antenna."

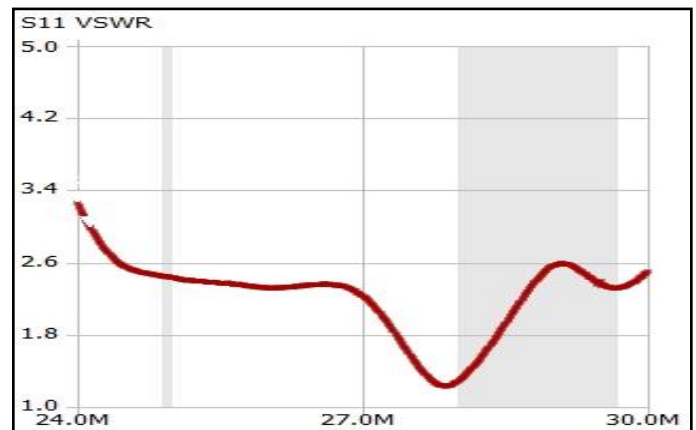
The new model run gave (left to right) the SWR, 12 meter pattern, and 10 meter pattern results shown below.



Notice first that the SWR at 12 meters is now much lower than before - a much easier task for a tuner. There is also a fair amount of directivity due to the orientation of the wire elements that could be a nice tool. Unfortunately, in my situation I'm constrained to an orientation dictated by the house and roofline.

Now, no one has ever made a QSO using an antenna model, so the proof is in the building. I cut the wires to the lengths that were modelled and climbed the ladder (with XYL standing by with cellphone preset to 911) and strung the wires. Then used a nifty little tool I'd recently acquired - a Nano H4 VNA analyzer.

Using the PC application software "NanoVNASaver" https://nanovna.com/?page_id=90 I obtained the SWR sweep at right. The shaded areas represent the limits of the 12 meter and 10 meter bands.



The first thing you'll pick up on is that the dip and plateau are about in the same place as the model, but the SWR on the plateau is significantly lower. Remember that the model characterized the SWR at the feedpoint, while this VNA sweep is taken at the bottom end of about 45 feet of RG8X coaxial cable. Feedline losses and other real-world characteristics have the effect of moderating the SWR seen at the transmitter end of the line. You also see that the 10 meter SWR dip is just off the bottom end of the band, but the SWR is not bad within the CW segment. A careful spot of pruning could ease that on up into the band.



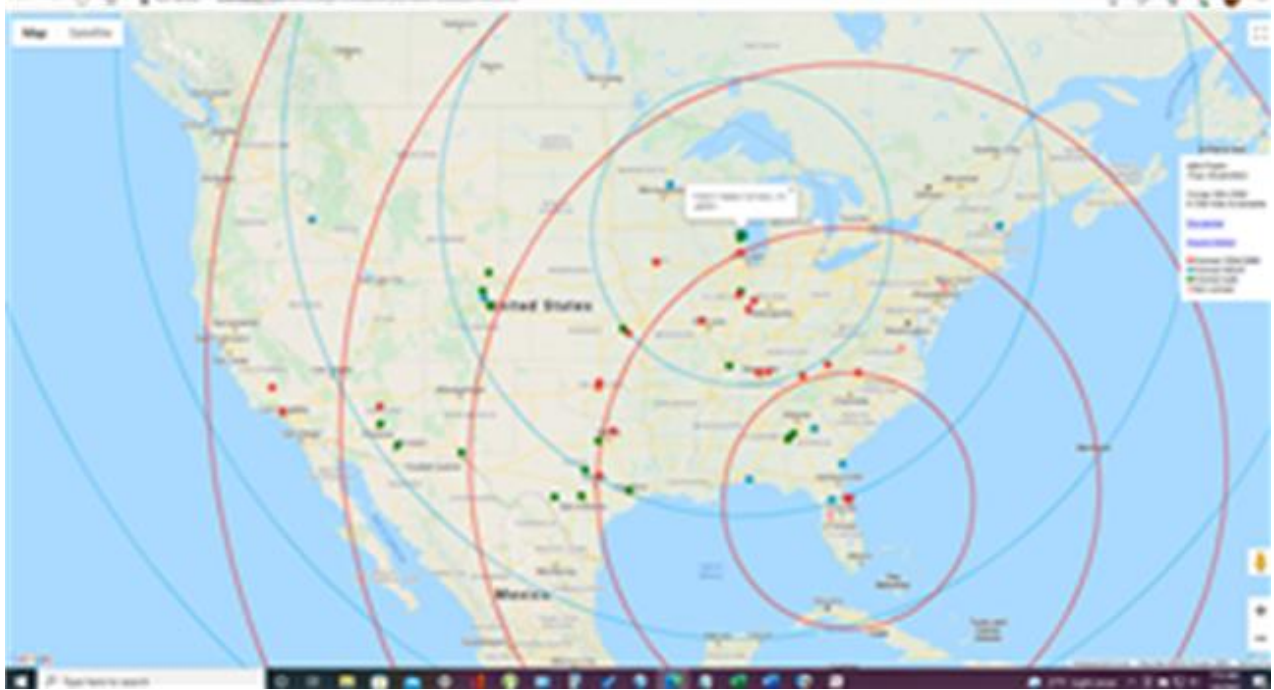
But, wanting to spare my bride of 49 years (WD5CMA) the stress of more "911 standby duty," I declared this project "good enuff!"

N5IB

Fox Hunt Station Mapping

Propagation on 40m: An interesting phenomenon occurred on the evening of January 4th 2022

Fox Hunt advocates like to watch propagation. This brings about thoughts and map picture from the Tuesday evening 40m Fox Hunt. The map (live mapping) is shown below. Map courtesy of Fritz, K4OA.



The legend may not be readable so here is an explanation.

There were two Foxii, one in Florida and the other in Wisconsin - indicated by Fox symbols on the map.

- The red dots are stations worked by the Florida station.
- The blue dots represent stations worked by the Wisconsin Foxii.
- The green dots are stations worked by both Foxii.

It is important to note that there is a lack of stations in the east; two Hounds reported (pink dots) saying they never heard either Fox.

Notice that there was one station in the northeast, K1WHS, that worked the Wisconsin Fox. Other than the one station, the whole east coast which normally has 10 plus stations reporting, is blank down to North Carolina and Tennessee. The concentric rings represent 500 miles each.

With three exceptions a line could be drawn from the Wisconsin Fox to the Florida Foxii location; those exceptions are one N.C. and two east Tennessee stations.

If you like to study propagation and have fun while doing it join us for the Fox Hunts.

www.grpfoxhunt.org/

73 de n4mj//glenn

Hilltoppers

In January Johnny reported; We now have the **Hilltoppers** back in stock and ready to ship.

These are a great portable radio that was designed by Dave Benson K1SWL.

There are three band choices, 40, 30, and 20 Meters.



De K3RTA Photo



You can find them here:

<http://www.4sgrp.com/index.php>

No price increases!

The price is the same as when they were offered last time.

See all of the Four State QRP Kits!



Shorts



1942: NAVAJO CODE TALKERS

Inventors of the Unbreakable Code

Every WWII combatant appreciated the need for an unbreakable code that would help them communicate while protecting their operational plans. The U.S. Marines knew where to find one: the Navajo Nation. Marine Corps leadership selected 29 Navajo men, the Navajo Code Talkers, who created a code based on the complex, unwritten Navajo language. The code primarily used word association by assigning a Navajo word to key phrases and military tactics. This system enabled the Code Talkers to translate three lines of English in 20 seconds, not 30 minutes as was common with existing code-breaking machines. The Code Talkers participated in every major Marine operation in the Pacific theater, giving the Marines a critical advantage throughout the war. During the nearly month-long battle for Iwo Jima, for example, six Navajo Code Talker Marines successfully transmitted more than 800 messages without error. Marine leadership noted after the battle that the Code Talkers were critical to the victory at Iwo Jima. At the end of the war, the Navajo Code remained unbroken.

[Read more about Navajo Code Talkers on CIA's website.](#)

Wave Behavior, explained!

From AT&T - Bell Labs movie about wave behavior. You can watch and learn about the waves as they move down the conductor, terminated in open, short etc. From the 1960's.

<https://youtu.be/DovunOxly1k>

Understanding Transmission Lines

A couple of videos on transmission line theory. Easy to understand.

Tektronix - Transmission Lines

<https://www.youtube.com/watch?v=I9m2w4DgeVk>

DC Pulses on Transmission Lines

<https://youtu.be/B86rV5FdKpU>



more Shorts



It is a perfect time to do some Winter Fireside reading, and here is a good place to begin:

A Ham's Guide to RFI, Ferrites, Baluns, and Audio Interfacing

Revision 7 Jan 2019

<http://audiosystemsgroup.com/RFI-Ham.pdf>

by Jim Brown K9YC

<http://k9yc.com>



Winter Field Day

With the St. Louis QRP Society

It was a sunny day on Saturday January 29th when several members of the SLQS ventured out to Babler State Park in western St. Louis County to operate Winter FD. The temperature started out about 27 degrees when we arrived at about 11:30 a.m. We had a nice shelter with a stone fireplace.

Antennas were quickly erected for 3 stations. We worked 40, 20 and 15 meters. Stations were setup in the shelter which for the most part protected us from the slight breeze.





A fire was lit in the fireplace in order to warm up if needed. Contacts were being made on all bands but as usual the money bands are 20 and 40 meters.

Hotdogs were cooked over the fire for those who wanted a snack. Eleven members attended. Two brave XYL's stopped by and three canines visited. About 6-8 hikers stopped to see what we were doing, one of which was a ham. It was a pleasant day of operating outdoors and plans were made to do it again next year.



Counting turns made easy when winding very small toroids! de N5SE

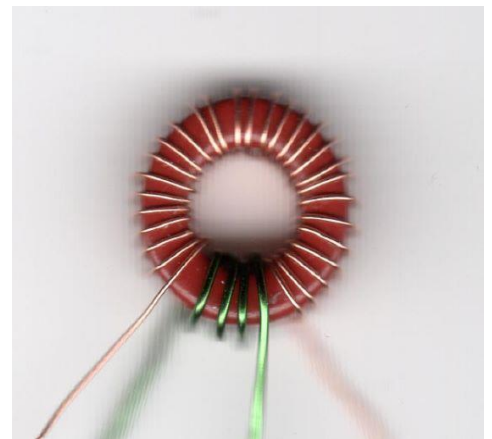
I was first licensed as KN5JJZ in 1957 and got on 40 meters with a home brew xtal QRP transmitter; an ac-dc 35Z5 rectifier and 50L5 final on a plywood chassis. Been a lot of water under the bridge since then, I got older, fingers stiffer and eyesight poorer while the parts grew smaller and smaller along with wire gauge getting bigger and bigger.

In particular, toroid winding became a must, many in the smaller FT50 and FT37 sizes. On these small toroids, I found it harder and harder to keep an exact count wound on a given toroid.

As smart phones became popular, many acquaintances suggested using a phone to photograph the toroid. Then manipulate the image on the phone to count the turns off the screen. A great solution for most people; those with nimble fingers and keen eyes.

Several years ago, I found an alternate solution to my problem. Using a PC scanner, scan the toroid at 200 to 400 dpi. Blow the scanned image up on your pc monitor. Then easily count the turns. Just keep scanning and counting until your toroid is like you want it. It is like editing a document, only you do not have to save the resulting file.

The image is a FT37-2 with 28 turns of 30 gauge wire and 4 turns of 27 gauge wire. This trick also works to inspect any small flatish object.



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The St. Louis QRP Society booth at the St. Louis Winterfest 2022



We had many visitors at the booth. There is always an interest in QRP. Some just want to know what it is all about and others have been QRPer's for a long time. KØFHG brought some items for show and they had a lot of interest as Bob is an expert builder. We had a signup sheet for those who wanted to receive copies of our newsletter. KKØU, KØFHG, WAØTSY, KCØPP and NØMII helped man the booth.

Four State QRP Comfortable Nets

Meet each Wednesday night beginning at 20:00 Central Time. Add anything to the exchange that you wish, temp, rig, ant, etc.

Checking into all sessions is encouraged. We call it the "Clean Sweep".

8:00 pm Central time - 40 Meter Net on 7.122 +/- QRM ACØBQ/NCS

8:30 PM Central time - 80 Meter Net on 3.564 +- QRM ACØBQ/NCS

9:00 pm Central time - DMR Net on Talk Group 31654 NØYJ/NCS

NO Digital Net at this time.

All are welcome!

DMR Voice Net

Wednesday evening DMR Voice Net will be at (Thursday) 0300 UTC (9:00PM Central Time Wednesday/) Four States QRP has a Brandmeister DMR Talk Group (TG31654). Join us to discuss QRP, ask questions, or just ragchew. The Wednesday net is a directed net but any other time you may use the Talk Group to chat with other QRPers. Net Control operator is Bert NØYJ.

For information and help, check out the DMR subgroup on 4sqrp.groups.io

<https://4sqrp.groups.io/g/DigitalFM>

Second Sunday Sprint

Occurs on the second Sunday of each month, 7 to 9 PM Central

Any mode, any band (except WARC & 60 mtrs) -

- Suggested frequencies: standard calling freq. plus 7122 and 3564 (CW), and 3985, 7285, and 14285 (SSB).
- as well as the usual QRP watering holes.

QSO's with the same station on different bands are allowed. CW and SSB portions of a band count as two bands.

- Calling CQ is suggested to be "CQ 4S"
- Exchange is "RST, SPC, member number (power if non-member)"
- 5 Watts max CW, 10 Watts PEP max SSB.

The station with the most contacts each month will be emailed a certificate. Furthermore, the top three stations with the most SSS contacts during the year will also receive certificates via email.

Scores are submitted via the grpcontest.com/4sgrp website (compliments of W8DIZ).

For full details, please download the [complete rules \(PDF\) here](#).

For questions, please contact John (AAØVE): SecondSundaySprint@4sgrp.com

Thursday Morning

The Four State morning net has been convened for members who like to start the day on the air.

We meet each Thursday morning at 8:00 AM Central on 7122 kc. 7122 has become the Four State 40M hangout frequency, and often members can be found there on any morning.

Editor's Note:

Articles are needed to make every Banner issue successful. If you have something of interest, please send it to the editor at the email address below. You do not need to send a finished article. You can send some comments, notes, etc. and I can put it all together for you. Pictures are always of interest. Some of the items of interest would be outings and /or operating events by yourself or a group, construction whether equipment, antennas, accessories, QRP Field Day, SOTA, POTA, etc.

de KCØPP

editorqrpbanner@gmail.com

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