NVARC
Nashoba Valley
Amateur Radio Club

SIGNAL

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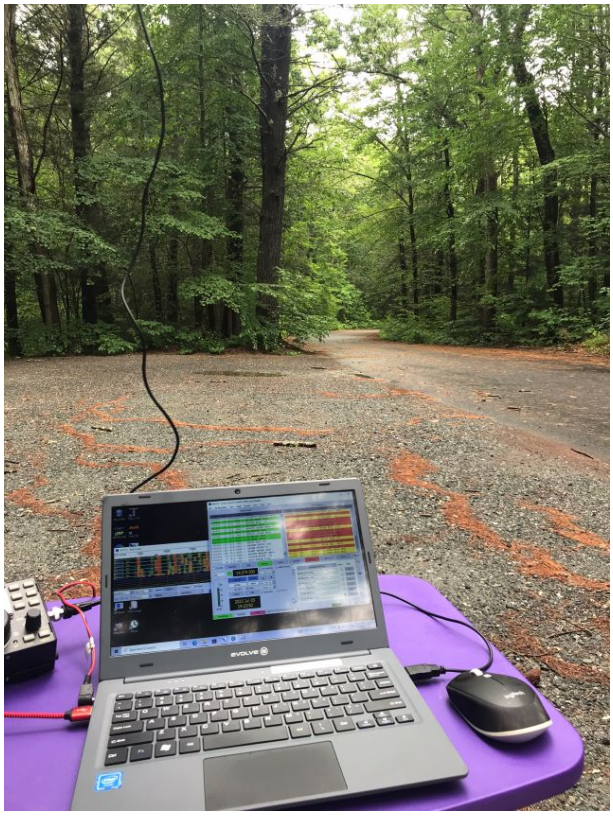
Member Profile: John, KK1X

How did you get interested in ham radio?

My older brother and I built a pair of Heathkit walkie-talkies in the 60's. I was hooked. I had no idea what was going on when I connected the Channel 9 CB antenna to the lightning ground rod system, but I talked to a guy in somewhere in Connecticut. I was in Massachusetts at the time, but I was only nine so it was magical. It still is, sometimes.

What parts of the hobby most interest you?

Currently I enjoy making and testing antennas for portable operations. Baluns and ununs no longer confuse me so much, and I have made a number of transformers for end-fed antennas, both "random" and half-wave.



John's typical operating environment.

How did you first find out about NVARC?

When I was first licensed in 2001 I stumbled upon a mailing list. I made myself known on that list, and I was invited to Saturday breakfast by K1BG. They haven't gotten rid of me yet.

What are your impressions of the club?

As with all clubs, 20% of the people

do 80% of the work. I'd like to see more actual participation.

What else can you tell the club about yourself and/or ham radio?

I originally joined the ARRL in 1976 as an Associate member as I was unlicensed. I couldn't dedicate time or resources to the hobby at the time, so dropped it. Many years later my neighbor N1PZ (SK) let me know the code requirement had been dropped, so I took the test and got my ticket.

Fun Fact about you.

I knit, and spin my own yarn. I go to the Deerfield Fairgrounds three times a year. Twice for radio, once for the NH Sheep and Wool Festival.

What is your favorite expression or quote?

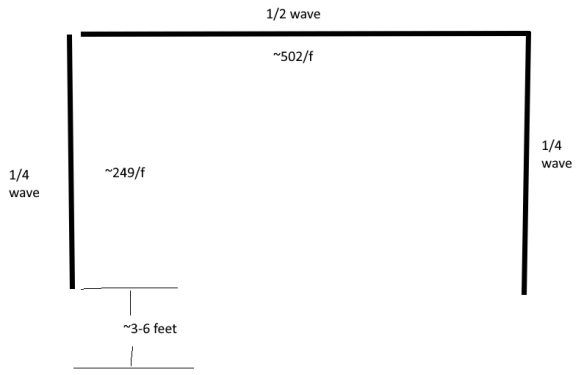
That can't be printed in a family-friendly outlet.

Half-Square Antenna

de JOHN KK1X

Several months ago, I wrote about the Rybakov antenna - a.k.a. "random" vertical antenna twenty - eight feet tall, that uses 4:1 unun for impedance match and a few radials. It worked quite well (IMHO), and it's in the rotation of antennas that I routinely use, along with a set of dipoles, about which I didn't feel compelled to write. I think we all know 234/f[1].

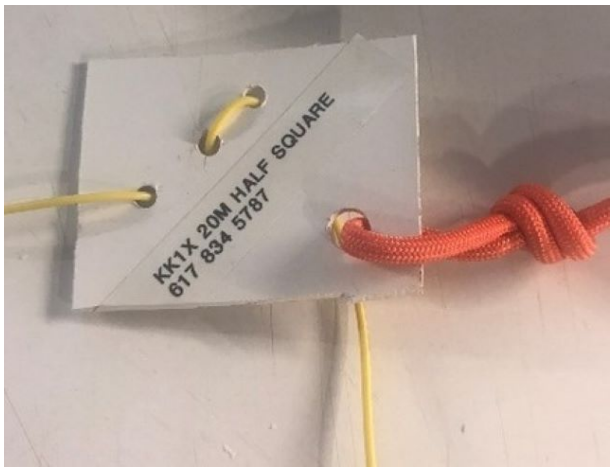
I still spend a disproportionate amount of time watching YouTube videos, and a lot of them describe antennas. I like building antennas and testing them, provided they aren't terribly complex. (Refer back to the dipole . . .). One antenna that captured my interest is called the half-square. It allegedly provides gain over a dipole, and I think dipoles are fairly nifty. The half-square is not difficult to build, but it's a bit tricky to tune properly. The antenna consists of two quarter-wavelength vertical radiators separated by a half-wavelength horizontal phasing line. Crude drawings are my specialty – below note the break in the upper left corner, which is the feed point of the antenna.

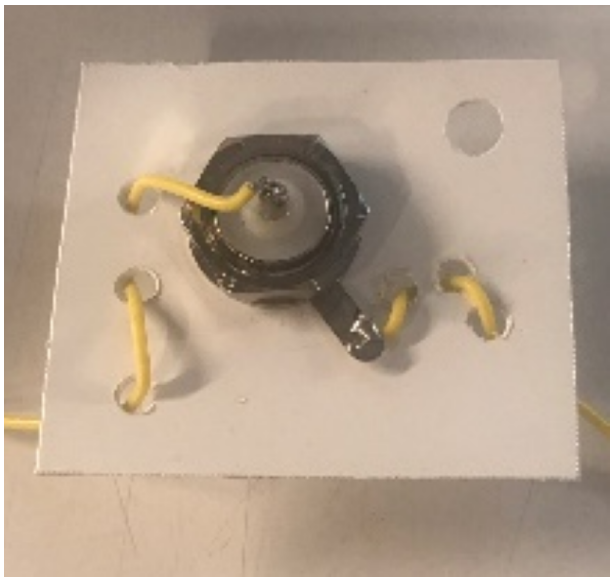


The "near end" vertical element is (arbitrarily) driven by the center conductor of

[1]Ed: Refers to wire length in feet over target resonance frequency in MHz: $\frac{234ft}{F(MHz)}$. This relation is typically used to make one half of a half-wave dipole, placed at least half wavelength from the ground.

the coax feed. The shield drives the half-wave phasing line, which in turn drives the "far end" vertical. Note that the 180 phase shift between the center and shield conductors, and the additional 180 shift from the phasing line allows the two vertical elements to be driven in phase, approximately doubling the signal. Well, that is my interpretaition.





Having merely watched a few videos without completely grasping the details, I just used common formulas for the length of the radiators. Quarter wavelength? I know that. 234/f, right? I like to use FT8 and PSKReporter to help determine antenna performance. Based on a target frequency of 14.1 MHz[2], I calculated 16.6 feet (199 inches) for the first vertical radiator. The second vertical radiator and the phasing line are made of one contiguous length, so I tripled that length. I added six inches to either end to allow for tuning, but kept the spacing at 468/f, or 33.2 feet (398 inches), across the top.

Using 26-gauge silicone-insulated wire, I measured out the required lengths of wire. The "near end" corner of the antenna consisted of a bit of plastic and a coax connector. Holes were drilled to strain-relief the two wires, a mounting hole for the connector, and one for the support rope. The "far end" of the antenna was simply a support rope hole and several strain relief holes.

Supporting this antenna is an exercise as it requires two supports. I find that the Bill Ashe Visitor Center at the Oxbow National Wildlife Refuge on Devens is a great place to test antennas. There is a median in the parking log about five car

[2]FT8 runs at 14.074

lengths long. It's easy to set up a single mast with the drive-on stand. For this exercise, I drove a couple of fenceposts into the ground, and tied my masts as tightly as I could.

On my first tuning trip, I had the far end of the antenna fixed to the mast, and the driven end was attached to a rope through a pulley. The second trip was made easier by using pulleys and halyards on either end.

With a target frequency of 14.1 MHz, I measured SWR at something like 13.8 on the NanoVNA. I lengthened each end of the antenna by about six inches and measured about 13.3 on the NanoVNA. I quickly realized my faulty thinking and shortened it by a foot. I trimmed by folding the elements back with tape. I find that's close enough for ham radio. For reasons I don't understand it also works with insulated wire.

I got the antenna's SWR just shy of 2:1 in the 14.1 region and made some 39 POTA contacts in two hours. I then packed up for the day. I didn't consider an SWR of 2:1 acceptable, so thought more research (OK, some research) was in order. I found other opinions that the 234/f and 468/f calculations we all rely on for dipoles were not working well. Not surprising.

The new information indicates that better numbers are 249/f for the verticals and 502/f for the horizontal member. I adjusted the antenna to use these new numbers, adding wire with crimp splices where needed (well, this IS a prototype). I noticed that the 502/f is suspiciously close to half the 1005/f used for loop antennas. There's probably something there. . .

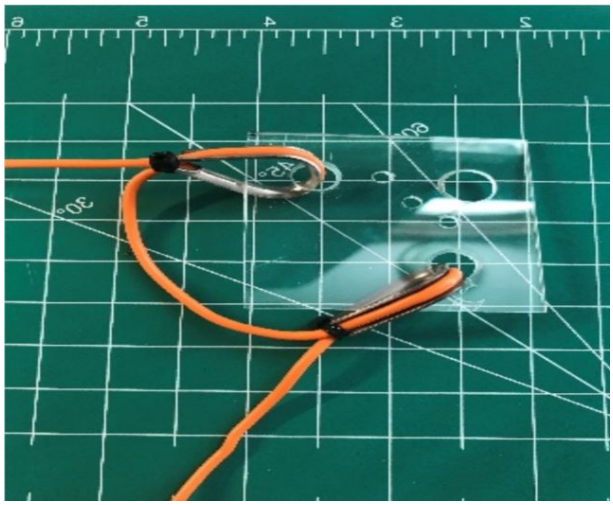
This configuration yielded an SWR of about 1.3 at the design frequency (with a little tuning, of course), and in an hour of operation, I snagged 28 POTA contacts before the rain started to ramp up. I strongly suspect the change in SWR is primarily caused by lengthening the phasing element. The antenna design is likely best served by having that phase delay exactly one-half wavelength.

After taking the antenna down, I remeasured the two vertical legs - they differed by about three inches. For the next test, I'll lengthen the short leg and retest. It's nearly time to figure out a nice way to build this.

I set aside a day for antenna testing, starting around 10 AM in the Bill Ashe Visitor Center again. After getting the antenna up in the air again, I measured the ("adjusted") vertical sections again, finding them to be 188" and 184" inches rather than the previous "three-inch" difference. Measure twice. . . I adjusted the legs to the short length, and measured an SWR of 1.7 at about 14.220, about 120kHz high. I added two inches to both of the vertical legs and got an SWR of 1.73 at 14.105. Pretty good, but we can do better.

Sticking with my theory that SWR is adversely affected by a phasing line of the wrong length, I shortened that by six inches (yes, I measured) by sliding the

support piece along the wire. I had to in turn shorten the adjacent leg by six inches to compensate. The SWR rose to 2.2 at the same 14.105 measurement point. I must be on to something. I slid the support back a foot, shortened the vertical leg a foot, and measured an SWR of 1.5. That's close enough for John's house.



The next step of course was to get better wire and fashion something better for what I loosely term "brackets". I ordered some 16-gauge silicone insulated wire from Amazon (orange – I don't want pedestrians tripping over invisible wire), and at one of the big box stores I purchased a small piece of polycarbonate sheet. I used a heat gun to bend a right angle into the end of the "near element" bracket after drilling the mounting hole for the coax connector. I drilled other holes for support ropes and thimbles for the wires. The prototype used a series of holes to hold the wire in place, but thimbles and wire ties provide a much nicer result. For the "far element" end, a small piece of polycarbonate was drilled with holes for a support rope and the two wire thimbles. I cut two pieces of wire about a foot longer than the wires of the prototype. Yes, without measuring – I'm merely duplicating the prototype. The thimbles were attached with short bits of magnet wire – I knew adjustment was ahead.

When I got out to the test site and got the antenna up in the air, I measured the "near" and "far" elements. The far element was about eight inches shorter, meaning the support had to move about eight inches. Once the element lengths were equal. I pulled out the NanoVNA and measured SWR of 1.75 at 13.6MHz. Trimming six inches brought the frequency up to 13.8 with a similar SWR. I then trimmed nine inches, shooting for a minimum SWR at 14.1MHz. SWR of 1.49 at 14.10 was good enough (again) for John's house.

Calling CQ POTA yielded twenty contacts in a half hour, which is a great rate. I was spotted all over EU and had contacts with Spain, Germany, Belgium, and Russia. I think the German gave me a signal report of 0. With 10 watts!

and zip ties to make things all pretty. The ends got treated to some glue-lined shrink tubing as well.

In summary, I find that this antenna does perform well, albeit only on 20 meters. That is the band I use the most, though, so it's not inconvenient. What is inconvenient is the need for two supports separated by 70 feet or so. I still keep it in my kit.

I replaced the magnet wire with thimbles

73, de KK1X

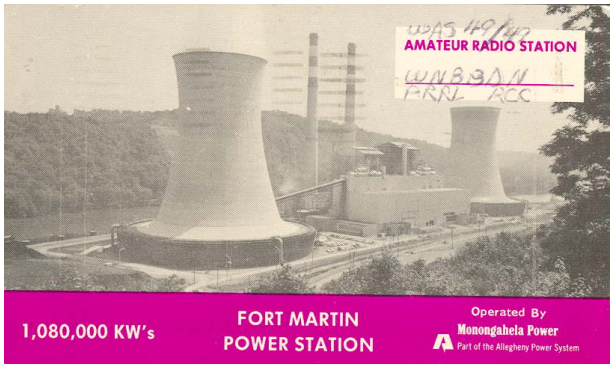
QSLing – Why It Matters To Me

de BRUCE K1BG

Technology has changed things. LoTW (Logbook of the World) and other digitally based QSLing services have changed the landscape of QSLing. These services are cheap, fast, convenient, and take all the fun out of QSLing. I much prefer the printed QSL card.

What is a QSL anyway? "QSL" is one of the old "Q Signals" used by telegraphers. It means "I am acknowledging receipt" of a message that was sent. "QSL ?" is a question: "Do you acknowledge receipt?" Beginning in the late nineteen teens to early nineteen twenties, amateur operators started sending post card sized "QSL cards" to acknowledge and provide proof of contacts. This fed into other popular ham radio activities like award hunting. WAS and DXCC (Worked All States, and DX Century Club, two popular award programs) might not exist without QSLing and QSL cards.

QSL cards contain all the information required to prove that a contact took place. Callsigns, date, time, frequency band, and signal report. Most times, personal notes are also included.



It's often said that "a picture is worth a thousand words", and in a sense the physical QSL card provides that picture. My first contact was with WN8BDN in December of 1968. The best contact I made as a novice was with Ivor, VK3XB, in Australia. Ivor loved handing out contacts to

young US amateurs like me. I've heard that Ivor had WAS with US novices on 40 meters! Arguably my best DX contact was with Larry, VQ9LA, on Diego Garcia island in the Indian Ocean. Not a bad DX contact, but this one was special because it was on 160 meters. I consider myself lucky that I have the cards confirming these contacts, and they are a constant reminder of the contacts I've made and all the fun I've had.

In 2003 authors Danny Gregory and Paul Sahre came across a shoe box full of QSL cards at a flea market, and turned them into a book – "Hello World: A Life in Ham Radio". The cards belonged to Jerry Powell, W2OJW, a lifelong ham who had recently become a silent key. The book details the amateur radio journey of W2OJW through his QSL cards. It's a fascinating read. If anyone is interested, send me an email and I'll send you a link to download the book. But like real QSLs, having the book is a better experience.

QSL cards traditionally have adorned the shacks of those that received them. Some of us have a card for every DXCC country they have confirmed, others display cards that are important to them. QSLs can be on the walls, in scrapbooks, etc. I've been in shacks where every square inch of wall space – and ceiling space – was adorned with QSL cards. Reminders of good times and great memories. A picture from my shack in 1969 – WN1KBG – is attached.

Do I send out a QSL card for every contact? NO! But I reply to cards I receive 100%, and I do send out cards for memorable contacts. DX, ragchews, new operators. Hams used to say that QSL cards were "the final courtesy of a QSO". While LoTW and the like may have changed this, QSLs and QSLing is still an interesting and exciting aspect of Amateur Radio. I, for one, hope the tradition continues.

Bruce, K1BG

Annual QSL sort

November brings a visit from Eric Williams, KV1J, from the W1QSL bureau. Eric will bring a batch of "incoming QSLs" from other bureaus around the world for us to sort before being distributed to US hams with a "1" in their callsign.

This is one of the more interesting meetings of the year. Socially, club members get to interact with other club members. We learn a bit about QSLing and enjoy pizza and soft drinks afterwards. A good time will be had by all! Please join us.

NVARC Member Benefits

Outgoing QSL Bureau card submission

NVARC will pay the fee and postage for members' outgoing cards; you need to provide proof of ARRL membership.

PowerPole connectors

NVARC purchases 30 amp PowerPole connectors and re-sells them to members at a reduced cost. $5.00 for 10 connectors; each connector consists of one red and one black housing and two contact pings.

NVARC email reflector

NVARC Board Meeting

November 1, 2023

Attendees:

Bruce, K1BG, James, N8VIM.

Call to Order: 7:30pm

A motion was made to budget $200 for pizza and refreshments at the QSL sort. The motion was seconded and passed unanimously.

A motion was made to double the salaries of the board members present at the meeting. This motion was seconded and passed unanimously.

Adjournment: 7:40pm

Acting Secretary Bruce Blain, K1BG

The Treasurer's Report

The treasurer's report for the month of August is not available at the time of the newsletter publication.

NVARC's 2 meter Net

The NVARC Information Net is held Monday nights at 7:30pm, Eastern time on the 2m Pepperell repeater, N1MNX: 147.345MHz +100.

The repeater has been recently repaired by James, N8VIM - check it out!

NVARC General Meetings

NVARC General Meetings are scheduled for the third Thursday of the month at 2430 UTC (7:30pm, Eastern Time), except for July and August, when no General Meetings are held. When held, meetings are at the Pepperell Community center.

Next General Meeting is Annual QSL Sort

Next General Meeting is scheduled for November 16, 2023 at 7:30pm. We will have our Annual QSL Sort. Pizza and refreshments will be provided. Bring in your dedication to the Amateur radio and NVARC.

Strays

Submitted by George, KB1HFT.

Contest Calendar

NOVEMBER

14 DARC FT4 Contest

18/20 ARRL Sweepstakes Contest, SSB

19 Homebrew and Oldtime Equipment Party

25/26 CQ Worldwide DX Contest, CW

29 Phone Weekly Test

DECEMBER

1-3 ARRL 160-Meter Contest

2/3 FT Roundup

2/3 INORC Contest

9/10 ARRL 10-Meter Contest

14 Worldwide Sideband Activity Contest

PO Box 900
Pepperell Mass 01463-0900
http://www.n1nc.org/
www.youtube.com/@nvarc

Join NVARC! Annual membership dues are $15; $20 for a family.

NVARC general meetings are scheduled for the third Thursday of the month at 7:30pm, Eastern Time. NVARC thanks Medtronic, Inc for providing the teleconferencing services under their employee volunteer support program for non-profit organizations.

Contact us on the N1MNX repeater.
$442.900(+), 100Hz$
$147.345(+), 100Hz$
$53.890(-), 100Hz$

This newsletter is published monthly. Submissions, corrections and inquiries should be directed to the newsletter editor: `editor@n1nc.org`

Articles and graphics in most PC-compatible formats are OK.

Editor: Vladimir A. Goncharov, W1MTI

Have YOU Paid Your NVARC Dues?

See: http://www.n1nc.org/MembersRoste for your reneval month.

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