



PCARA Update



Volume 16, Issue 2 Peekskill/Cortlandt Amateur Radio Association Inc. February 2015

Off to a racing start

The New Year started off with the annual PCARA Bring and Buy auction held at the January 4th meeting at HVHC. The auction was well attended with a good deal of equipment brought in for the occasion. Members Ray, W2CH and Marylyn, KC2NKKU were quite successful in moving many of their items, and at the end of the auction made a most generous donation. **Thank You Ray and Marylyn** for your very charitable gift! Contributions to the club's treasury from the auction came to approximately \$200.



NM9J auctions one of the dual-band transceivers brought to the January meeting by Ray, W2CH.

PCARA, WECA, and Stamford ARA received recognition for their participation in the 34th Annual Harry Chapin Run Against Hunger, in the December 18, 2014 edition of Croton-on-Hudson's *The Gazette*. Recognition was in the form of a letter from Race Director Jud Ramaker and Assistant Race Director Mike Grayeb, thanking the local community for its support. I can safely say that PCARA would be honored to participate in the 35th Annual Harry Chapin Run Against Hunger if requested. Thanks to PCARA members Malcolm NM9J, Henry KB2VJP, Bill WA2WOJ, Ray W2CH, and Marylyn KC2NKKU for their time and efforts! (Please see the article on page 5 in this month's edition).

On the repeater front, the Super Stationmaster antenna for the 449.925 MHz machine has arrived and is waiting for some mounting hardware and favorable

weather for installation. If you're interested in joining the work-party for setting up the antenna, please let me know.

Our next meeting is on February 1, 2015 at 3:00 pm at Hudson Valley Hospital Center in Cortlandt Manor, NY. I look forward to seeing each of you there.
- 73 de Greg, KB2CQE

PCARA Officers

President:

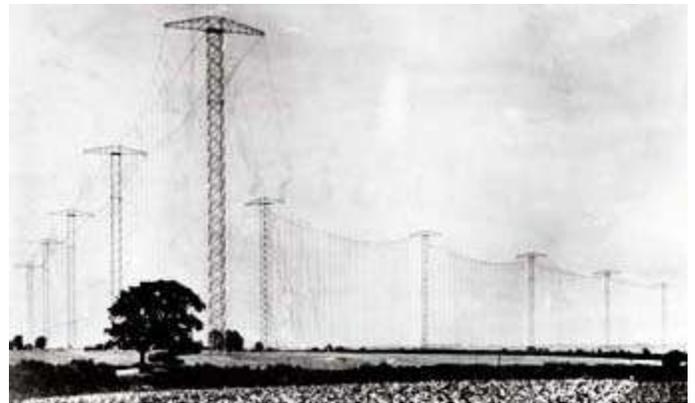
Greg Appleyard, KB2CQE, kb2cqe at arrl.net

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Marconi beam antennas at Bodmin, England, for SW transmission to Canada and South Africa. (See page 6).

Net night

Peekskill/Cortlandt Amateur Radio Association holds a weekly net on the 146.67 MHz W2NYW repeater on Thursdays at 8:00 p.m. Join net control Karl, N2KZ for news and neighborly information.

Adventures in DXing

- N2KZ

A Great Beginning

New Years would not be complete without the sounds of ARRL's annual Straight Key Night event. For just 24 hours, hams take to the air with vintage and homebrewed gear and send manual Morse code using just their fists and treasured straight keys.

Listen in and you might think the CW bands had magically fallen into a time tunnel back 70 years or more. All the messages you hear sound so individual with each and every operator expressing themselves with a signature 'swing.' The code you hear sounds thoughtfully sent with the casual tone. It is the Morse equivalent of a good slow conversation with your best friend sitting out on a porch on a hot summer's afternoon. Good times!

As much as I love Straight Key Night, I always have to squeeze in ham operating along with all the other activities that you might expect on New Year's Eve. There are always parties to attend, plenty of car runs shuttling people from place to place and all sorts of running around. Still, I managed to have some great fun this year, meet some new people on the air and learn a thing or two all in one day!

When operating on the low bands on 40 and 80 meters, I usually find correspondence with hams somewhere in my 'golden zone' between 500 and 1500 miles away. My wire dipoles are quite effective, but are not very high up in the trees (at about 30 feet or so) so you have to expect to reach these distances frequently. I can only wonder what it might be like to have an 80 meter antenna at or above a half wavelength up in the air. You would need some nice tall trees! For 80 meters, that would be up and beyond about 130 feet.

My first SKN QSO on New Year's morning was on 40 meters with Terry, K8EHE, in Central Ohio, running his trusty Yaesu rig into a Zepp antenna. Following right behind him was N1PQ, Peter hailing from Harvard, Massachusetts just outside of Boston. We are both Red Sox fans, leading to fun conversation.

Later on New Year's Day, I ran into Jim, WT2W, on 80 meters from upstate in Auburn, NY running a wonderful Swan 260 with a very cool German straight key. The Swan wasn't drifting and had a good solid note. Next was another Karl, K8FE, from the



Swan 260 HF transceiver as used by Jim WT2W on Straight Key Night.

Bay City area in Central Michigan. Working Karl was an honor! He is a member of the ARRL's A-1 Operator Club and also a member of FISTS. A great fist he had, too! Later

on, I also worked René, KG5AYB, out in Corpus Christi, Texas on 10 meters. We chatted for



René KG5AYB with XYL at the Grand Canyon.

half and hour or more about just about everything — 10 meters, VHF and UHF, linked repeaters, dogs, you name it. Another great QSO it was!

Straight Key Night also commemorates my anniversary as an active amateur radio operator. I completed my very first QSO on January 1, 2000 by working Harold, W1EES, on 80 meter CW. Harold started his ham radio career 68 years before me in 1932! My CW operating skills have improved a little since then. I was thrilled to just copy his callsign, name and QTH. Happy New Year to all!

Novice Operation Remembered

Recent on-air CW chats led me to some interesting memories of old-time Novice operation heard in the 1950s. Back then, Novice HF operation was limited to CW using crystal-controlled transmitters in an effort to limit accidental off-frequency interference. It was not practical to have numerous crystals to cover any frequency on a particular band. The only remedy was to send your CQ and then tune up and down the Novice band segment looking for replies.

There was a method to this madness. Novices were encouraged to use suffixes after their CQ calls to suggest where they might be listening. The 1948 ARRL Radio Amateur's Handbook explains these signs thoroughly:

HM-Will start to listen at high-frequency end of band and tune toward middle of band.

MH-Will start to listen in the middle of the band and tune toward the high-frequency end.

LM-Will start to listen at low-frequency end of band and tune toward middle of band.

ML-Will start to listen in the middle of the band and tune toward the low-frequency end.

Example: If the procedure will be to tune from the middle of the band to the high end, a CQ call goes:

CQ DE W6RBQ MH K.

I actually heard an operator using this shorthand during Straight Key Night and I searched and searched

to find its meaning. See <http://novicerigroundup.com> for this and many more Novice folkloric tidbits!

It's Your Speed

CW couldn't be easier! No need to procrastinate! Get on the air! You'll be great! Try FISTS' *Get Your Feet Wet* event on the third weekend of this month from 0001 UTC through 2400 UTC on Sunday, February 15, 2015 — that's Saturday night 7pm Eastern, 6pm Central, 5pm Mountain and 4pm Pacific until Sunday night at the same time. It's 24 hours of casual fun at the speed of your choice. We will go as slow as you need to go! Look on or around these two frequencies: 3558 kHz, 80m CW and 7110 kHz, 40m CW. Newbies, Elmers and everyone in between are invited!

When you are done, e-mail a note about your experiences, comments and suggestions to me at: feetwetlogs@fistsna.org. Send in your log showing you made 5 or more contacts. Do this for every GYFW you take part in this year. Your name will go in a bucket for a chance to win one of two gift certificates. Remember to let me know what kind of rig, output power, antenna and key you were using. **THIS IS NOT A CONTEST** — only a great way to build confidence as a fine CW operator. You can do it! Complete details can be found at: <http://fistsna.org/operating.html#feetwet>. See you on the air!



Tame a Giraffe

The only time you might hear me on the air using a microphone is on 2 meter FM. I don't currently have a 2 meter base station at my QTH, so if you hear my voice on 146.67 MHz I am very likely behind the wheel of the N2KZ-mobile traveling somewhere. You'll also find me camped out, sitting in my driver's seat outside my garage, on Thursday nights hosting the PCARA Old Goat's Net.

Operating from my car has had its challenges. For years, I used my 5 watt Icom IC-T7H HT along with a Larsen mag-mount on the car roof for all of my VHF/UHF QSOs. Intermittent and frustrating reception took its toll on my forgiving friends.

Due to quite justified peer pressure, several months ago I upgraded to a 55 watt Yaesu FT-1900R 2 meter transceiver using a Diamond M285 single 5/8ths wavelength trunk mounted whip. My commute to and from my workplace in Stamford, CT continued to be challenging. I often drive through very rocky crags and valleys where 2 meter FM transmissions simply don't flourish. Trying to reach the PCARA 2 meter repeater was sketchy at best.



To improve my results, I decided to double the length of my antenna and try the towering Diamond NR22L whip. Providing 6 dBi of gain, this monoband antenna travels at about 11½ feet above the road's surface. Let's just say I get a lot of attention riding around with this configuration. The NR22L is a dual 5/8-wave array ready to burn holes in the clouds. Different it is!

The performance of my giraffe antenna has been quite different than my previous simple 5/8 λ whip. The longer length design of the NR22L flattens the take-off angle of my transmissions to achieve additional gain. It also changes my results dramatically.

Upon first installing the antenna, a quick field test with Malcolm, NM9J, proved that both transmission and reception came up a couple of notches on his S-unit scale.

The NR22L made simplex operation between my car sitting in my driveway and Malcolm's QTH (13 miles distant) reliable and nearly full-quieting. I could now hear things that I never could before. So far, so good.

After a couple of day's use, other characteristics became obvious. Changing your antenna pattern really changes everything. With a single 5/8 λ whip, my transmission pattern looks a lot like a nice fat fresh donut. Add an additional 5/8 λ length to the design to create a two-element vertical array and the donut pattern is gently squashed. What used to be full and round is now flattened a wee bit but extends farther. Also keep in mind that the length of the antenna is doubled, so you also gain significant height. It doesn't hurt to be able to fling your signal above some obstructions.

The final result has been revelatory. When the new, tall array is in the clear, it sends and receives signals farther than anything I have experienced. Reception also becomes incredibly robust. One fine example is reception of the ARRL's W1AW Morse Code broadcasts on 147.555 MHz. Newington, CT is a good 55 miles away. Using the single whip, I would hear tiny bursts of code during my drives home from work. Now



Diamond NR22L antenna soars 97" above the trunk of Karl's vehicle.

reception is filled with long periods of strong signals.

It also became obvious that the NR22L's extended reach is a compromise. In areas where rock-filled valleys thrive, my mobile signals now have a different personality. Signal ups and downs are amplified. When they are strong, they are very strong. When they are weak, signals now disappear. The shorter whip was much more consistent although mediocre. One thing for sure, I can work many more repeaters and stations than I ever could before. The thinner and narrower antenna pattern of the NR22L is much easier to interrupt. The smaller M285 allows signals to jump bumps better but it is just not a DX antenna. Each one has its role. I would love to try the NR22L in Michigan where you can see the horizon all around you and the world is flat!

My new Diamond NR22L really shines during simplex operation. In our area, you will often find a voice or two on 146.52 and 146.58 MHz. I had one particularly memorable pair of QSOs one afternoon. Stations in Valhalla (Central Westchester), NY and in Clifton, NJ heard me on simplex with armchair copy following a long chat with another couple of simplexers in Westport and Norwalk, CT. I've never done that before! No doubt, the new antenna really gets out.

Malcolm, NM9J and I had an investigatory QSO on a Saturday morning to put the NR22L to the test. Malcolm was operating at home with 10 watts as I proceeded to drive around my neighborhood — about 15 miles distant. Except for a blackout or two as I was passing heavy rock zones, our simplex QSO went on and on. I visited two local peaks and the reception was entertaining and gleeful. We easily made contact using just 5 watts FM in both directions. I heard a couple of conversations going on simultaneously on the simplex calling frequency 146.52 MHz along with several other QSOs in progress. Malcolm and I had to vacate our original simplex frequency of 146.565 MHz because we were clashing with another QSO. Simplex comes alive with this antenna!

A couple of other things I should mention: The longer NR22L has a much more narrow bandwidth than the M285. My reception of weather band frequencies around 162 MHz became noticeably weaker. The NR22L also seems to be a better match and/or a more efficient design. My rig used to get pretty hot during our weekly Old Goat's Net - an hour or more of fairly continual conversation using the shorter M285. With my new NR22L, my rig runs so cool it's amazing. Maybe it had something to do with radiation coming back down the feedline into the rig instead of up into the air. My new antenna is literally so cool!

I now have to be very cognizant of height. Riding around with 11½ feet of antenna can be challenging! Clearance signs posted on bridges and parking lot entrances have new meaning. Diamond answered this

problem two-fold. Yes, the antenna is spring loaded to fold completely over by just pulling it up slightly to reveal a built-in pivot at the base.



Diamond NR22L antenna can be folded over by pulling up from the base.

The designers also considered aesthetics and durability. The bottom half of the antenna is stiff and strong and barely flexes even at highway speeds. The top half is a springy pliable thin steel rod that does flex but blends into the sky to reduce wind resistance and visibility. My wife still hasn't noticed the enormous increase in length of 'that embarrassing antenna.' My installation employs Diamond's attractive K600M trunk lid mount. It anchors my tall antenna with confidence.

If your car could handle the complexity, it would be wonderful to have both the shorter M285 and the giraffe NR22L on an A/B switch so you could adjust to any situation. Overall, the monoband Diamond NR22L is a very worthy investment. I can't wait to get to the top of Bear Mountain in the spring. Just rising a hundred feet from my QTH to the top of a nearby hill makes a world of difference. From Bear Mountain, I probably can work the world! I would recommend the NR22L for anyone who wants the very best in 2 meter mobile operation. What fun!

Our Condolences

The wife of my good friend Bob Duncanson, WD8RJL, passed away Sunday, January 11, 2015. Bob and Dorothy were married 52 years and you would rarely see them apart. Dorothy often attended ham radio get-togethers and was known for her beautiful smiles and warm heart. My prayers are with Bob and his family. Dorothy will be always missed.



Dorothy Duncanson.

The Duncansons are wonderful folks. I owe a token of gratitude to Bob who gave me the idea for our weekly Old Goats Net questions of the week. Bob pulled the same trick on the original Old Goats Net still heard every morning on the Bad Axe repeater in Central Michigan. I brought his terrific idea back with me to New York. Ham radio really is one big family.

Until next month, see you on the air and 73 de N2KZ The Old Goat, dit dit.



Run Against Hunger – thank you

Readers may recall that last year, on October 19, 2014, PCARA provided communication support for the Harry Chapin “Run Against Hunger”, with assistance from WECA and several Connecticut groups.

Henry KB2VJP has supplied a copy of Croton-on-Hudson’s *The Gazette* for December 18. This local newspaper contains a

letter from race director Jud Ramaker and assistant race director Mike Grayeb thanking the community for all their help in the 34th Annual Harry Chapin Memorial Run Against Hunger, which set new records in total participation and donations.

The report describes a chilly fall race day when temperatures failed to reach 50° F. Nevertheless, there were 1,050 registered runners and walkers for the three events — 5K Walk, 1¼ mile Fun Run and the 10K main Run around Croton, Cortlandt and over the Croton Dam.



Croton-on-Hudson’s ‘Gazette’.



Croton-Harmon High School on race day.

The report thanks the Croton-on-Hudson Police Department for their patrol cars, officers and auxiliaries who provided traffic control throughout the village on race day. Sergeant Barirde coordinated police operations and also provided additional suggestions to

improve race safety and lessen the impact on Village Residents. One of these suggestions was for additional communication support... as documented in the following paragraph from the newspaper.

“We implemented one of these ideas this year, reaching out to a local radio communications group, the Peekskill Cortlandt Amateur Radio Association (PCARA), to help us improve our on-course communications for the 5K and 10K events. Led by Greg Appleyard, members Malcolm Pritchard, Henry Ritz, Bill Wojnar, Ray Nahl and Marylyn Nahl joined forces with members of other area radio communications clubs including Kathleen O’Keefe of the Westchester

Emergency Communications Association (WECA) as well as Jon Perelstein, Paul Lourd, Woodrow Gaskin, and Christina Kovacs of communications clubs in Connecticut. These individuals enabled us to have radio operators at all four of our water stops as well (as) in the Trail Car and to establish a base station at the high school. Having in-progress race updates from this communications team was very helpful in tracking our runners.”

Not mentioned in the newspaper report was WECA’s Larrie Sutliff, W2UL who provided both the radio and operator for the Trail Car, following the last of the runners all around the 10K course.

The 2014 “Race Against Hunger” raised a total of \$40,000. Funds were divided locally between the Croton-Cortlandt Food Pantry, Croton Caring Committee, Caring for the Homeless of Peekskill (CHOP), Fred’s Pantry, Hillside Food Outreach and Food Bank for Westchester. Donations were also made to “WhyHunger”, Harry Chapin’s organization to aid growing of local food crops in the USA and in support of overseas charities in Mozambique and Haiti.

For more information about the “Run Against Hunger” pay a visit to the organization’s website: <http://www.runagainsthunger.com/>. There is a link to the organization’s Facebook page which contains many photographs of recent and past events. - NM9J

hard to give us a safe race course. Sergeant Barirde remains a constant source of ideas about improving race safety and lessening our impact on Village residents.

We implemented one of these ideas this year, reaching out to a local radio communications group, the Peekskill Cortlandt Amateur Radio Association (PCARA), to help us improve our on-course communications for the 5K and 10K events. Led by Greg Appleyard, members Malcolm Pritchard, Henry Ritz, Bill Wojnar, Ray Nahl and Marilyn Nahl joined forces with members of other area radio communications clubs including Kathleen O’Keefe of the Westchester Emergency Communications Association (WECA), as well as Jon Perelstein, Paul Lourd, Woodrow Gaskin, and Christina Kovacs of communications clubs in Connecticut. These individuals enabled us to have radio operators at all four of our water stops as well in the Trail Car, and to establish a base station at the high school. Having in-progress race updates from this communications team was very helpful in tracking our runners.

There are many others throughout our school system and village government without whom we could not stage our race. We once again had generous custodial support on race day with the tireless efforts of custodians Ismael Rama and Joe Vetrano. These men worked all day to accommodate

Newspaper paragraph on PCARA.

Build a Folded Franklin

Gain an advantage

What is the best design for a vertical gain antenna? There are numerous choices — you could choose from stacked dipoles, a $1/2$ wave or $5/8$ wave vertical ground plane, a J-pole or a Slim-Jim.

The Franklin phase

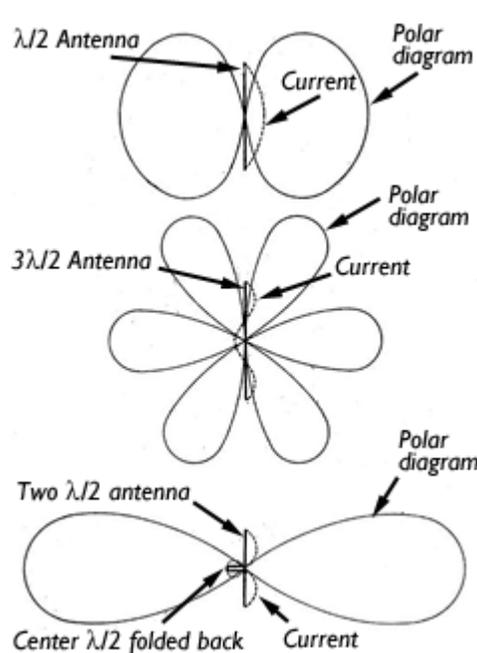
One of the pioneers of gain antennas was C.S. (Charles Samuel) Franklin, a British engineer who worked for the Marconi Company from 1899 to 1939. In 1924, he patented a wire antenna which was long compared with the wavelength, with radiation concentrated in one plane.



C.S. Franklin

In UK Patent 242,342 (U.S. 1,821,936) Franklin describes the derivation of this design, starting with a vertical half wave, whose current maximum is in the middle of the antenna. The radiation pattern is in the shape of a donut, with maximum radiation in the horizontal plane.

If the length of this antenna is increased to three half-wavelengths, then the standing wave pattern has three current



maxima at $1/4 \lambda$, $3/4 \lambda$ and $1 1/4 \lambda$ from the end. The two current maxima nearest the ends are then in phase with each other, but opposed to the phase of the current maximum at the center. As a result, the polar diagram has multiple peaks, with radiation at high and low angles in addition to the horizontal plane.

In C.S. Franklin's UK patent 242,342, the gain of a vertical antenna is increased by suppressing radiation from alternate half waves — in this case by folding the center half wave back on itself.

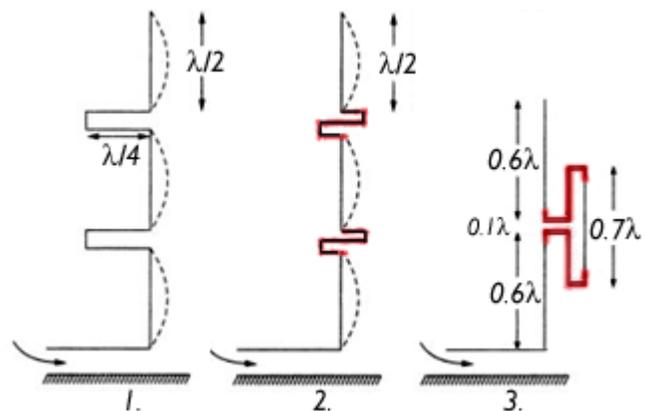
Franklin's innovation was to suppress radiation from alternating

half waves so the remaining half-wave sections have current maxima that are all *in phase*. As a result, radiation from these elements reinforces in the horizontal plane, at right angles to the antenna.

One way to suppress radiation is to fold the unwanted half wave section back on itself, making a $1/4$ -wave shorted transmission line. This is shown in the diagram where the center half wave of a $3/2$ wave-length vertical antenna is folded back on itself and the radiation is concentrated at right angles to the wire. An example of this type of antenna with a stub sticking out is the Cushcraft Ringo Ranger for 2 meters.

The folded back section can be awkward to implement and Franklin proposed that the unwanted half wave could also be wound into an inductor (coil), or a tuned circuit could be substituted. This arrangement has been used for AM broadcast towers and is also seen in mobile antennas for UHF where two half-waves are separated by an open coil.

Another modification by C.S. Franklin changed each non-radiating half wave section so it was bent back-and-forth upon itself to suppress radiation (meander line). This design was then modified into the **folded Franklin antenna**, by rotating the meander-line sections through 90 degrees so they are parallel to the radiating wires. The antenna can then be viewed as a number of half-wave radiators, slightly overlapping each other, with folded interconnections from which the radiation is small. See diagram below.



Derivation of the Folded Franklin antenna. **1.** Conventional Franklin antenna has three vertical $\lambda/2$ wires separated by two horizontal $\lambda/4$ phasing lines. **2.** The horizontal phasing lines are modified to non-radiating meander lines (red highlight). **3.** The meander lines (red tint) are rotated through 90° so they line up with the vertical $\lambda/2$ wires.

During the 1920s, Marconi's WT Company used large arrays of these folded Franklin antennas for the Imperial Wireless Chain beam stations (see pic page 1).

I found descriptions of the folded Franklin antenna in the following publications —

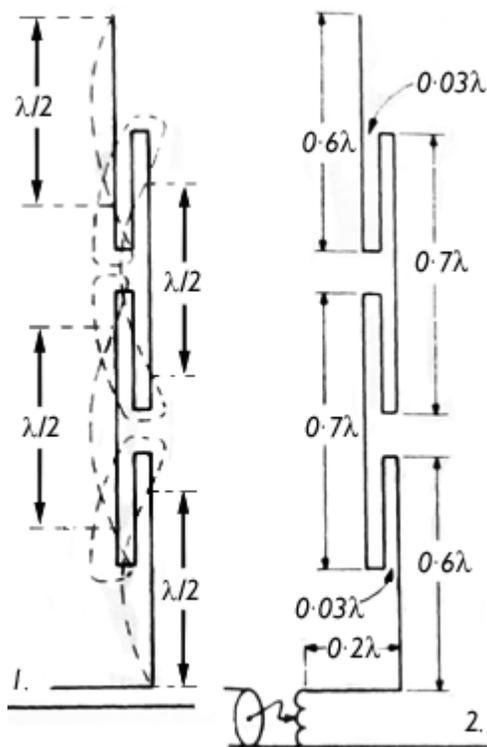
- (1) *The Amateur Radio Vertical Antenna Handbook* by Paul H. Lee, N6PL

(2) The RSGB VHF/UHF Handbook edited by Dick Biddulph G8DPS (1997)

(3) Antenna Engineering Handbook by Richard C. Johnson and Henry Jasik (1993)

(4) Antenna and Wave Propagation by U.A. Bakshi and A.V. Bakshi.

The first reference by N6PL provides diagrams of the antenna and describes how each successive half



Diagrams after N6PL (ref. 1) show:
1. Current distribution in a four half-wave version of the folded Franklin antenna. **2.** Dimensions of the folded wires in terms of wavelength (λ).

wavelength of wire is folded back on itself in such a way that the radiation from its central part assists the radiation from its neighbors. N6PL points out that the major portions of the currents are in phase and the resulting current distribution is “almost the ideal of a uniform current.”

In reference (2) from RSGB, some warnings are given about this antenna: “Provided that

the folded sections are significantly shorter than the radiating elements, the gain is not significantly degraded, although the whole structure is sensitive to capacitive loading by any housing and insulators required. The radiation pattern is frequency sensitive, and the main lobe will squint upwards or downwards as the frequency changes from the nominal. While these folded element designs look attractive for home construction, adjustments to optimize both the radiation pattern and input impedance are very difficult without proper measuring facilities. Poor gain and broken radiation patterns result if the sections are not properly excited and phased.”

These problems cannot be insuperable because I have seen commercial antennas with folded sections housed in a fiberglass tube — so I decided to make an experimental folded Franklin of my own for the two meter band. I chose a design with just three radiating

half waves so the overall length — around 8 feet — would still fit inside the radio room for construction and adjustments.

Construction

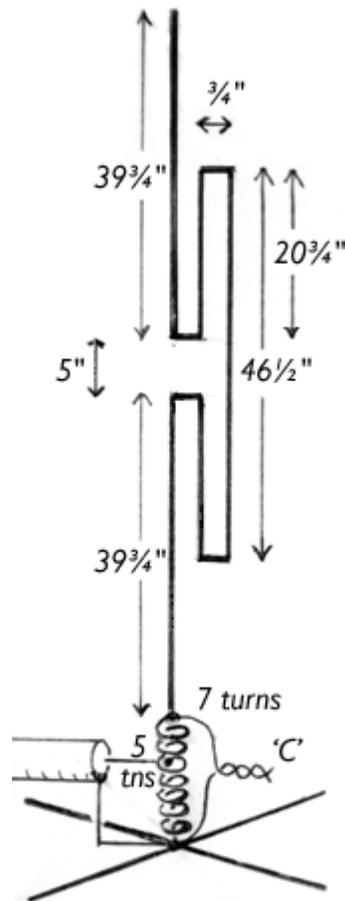
For my first attempt at constructing the antenna, I used PVC-insulated wire with lengths of 46" for the two 0.6λ sections and 54" for the 0.7λ section. The wire was secured to a length of plastic tube. This resulted in a resonant frequency lower than expected, around 126 MHz. The frequency shift is probably due to dielectric effect of the plastic covering around the wire and the presence of a central

support tube. (For an explanation, see the article “Wire antennas and insulation” from PCARA Update for October

2013.) I re-proportioned the wire lengths for resonance in the 2 meter band and arrived at dimensions of 39¾" and 46½" as shown in the diagram top right .

Construction is straightforward as the main radiating element and matching coil can all be fabricated from a single length of copper wire. I used 12 AWG solid copper wire with THHN insulation from Home Depot, and cut an initial length of 18 feet from the reel. The various lengths for the fold points were measured and marked then the wire was folded using pliers.

I already had some half-inch CPVC (chlorinated PVC) drinking water pipe, which has an outer diameter of 5/8". This was cut to a length of 7 feet 8 inches. The folded antenna wire was fitted around the plastic pipe then fixed in place with



Dimensions of folded Franklin antenna as built, with three radiating half waves. Capacitor ‘C’ is twisted, insulated wire.

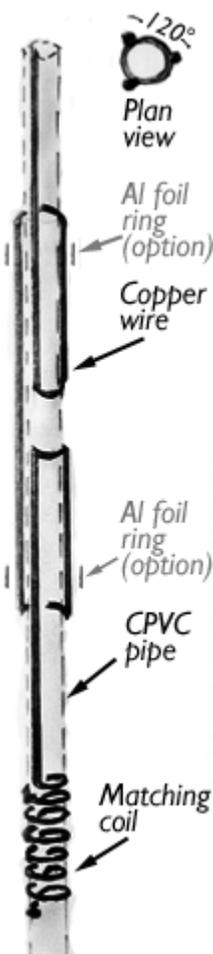
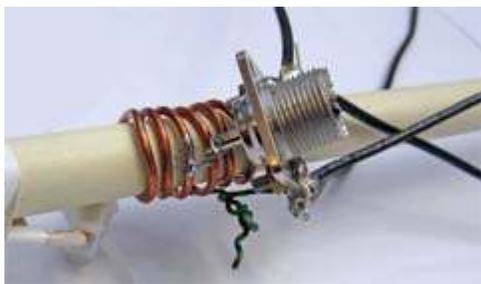


Diagram shows how the folded copper wire is bent around the plastic pipe.

vinyl tape. The folded sections were equally spaced at 120° intervals around the pipe's circumference.

The matching coil consists of 7 turns of bare copper wire, wound around the same 5/8" OD CPVC pipe. (This may not be the ideal material for a coil former, but it was convenient.) The coaxial feeder cable is wired



Matching coil, radials and coax connection at the base of the experimental antenna.

to the matching coil with the outer braid connected to the bottom of the coil and the inner conductor tapped 5 turns up. The coil is resonated on 146 MHz with a "gimmick" capacitor consisting of two lengths of insulated wire, 2 inches long, twisted around each other.

The base of the matching coil is connected to four $\frac{1}{4} \lambda$ radials, each made of insulated wire, 19½" long.

Tune-up

In order to adjust my new antenna, I made use of an MFJ-259 SWR analyzer. This allowed me to optimize the tapping point of the coaxial cable for minimum SWR, which was 5 turns up from the grounded base of the 7-turn coil. At the same time, I also adjusted the "gimmick" capacitor to tune the coil.

The result was an antenna that resonated at approximately 148 MHz. Performance seemed quite good for stations in the upper part of the 2 meter band, but SWR and performance deteriorated as the frequency went below 147 MHz.

I tried lengthening the wire at the top of the antenna, but this did not seem to help very much. The best way I found to bring the resonant frequency down into the middle of the two meter band was to wrap two thin strips of aluminum foil around the upper and lower folded sections, a few inches from the folds, then secure with tape. With this modification, SWR was 1.05:1 in the middle of the band and less than 1.5:1 at the band edges, 144.0 and 148.0 MHz.

I carried out a comparison of the folded Franklin with two shorter antennas mounted alongside. One of the comparison antennas was a quarter wave ground plane, while the other was a 5/8 wave ground plane. I tuned around the various FM repeaters and other signals on 2 meters, using the S-meter on my IC-706MkIIG for signal strength readings. In almost every case, the folded Franklin antenna was 3-5 "S-units" stronger than the quarter wave and 1-3 "S-units" stronger than the 5/8 wave antenna. The IC-706MkIIG S-meter is quite generous on FM, but the improvement in signal-to-noise ratio for weaker FM

signals was quite evident when switching to the folded Franklin antenna.

In practice

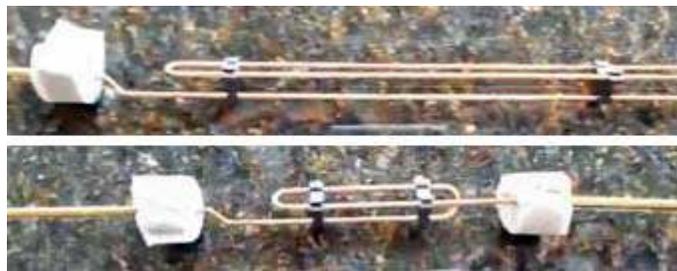
The construction method I chose made use of existing materials that were to hand. If you would like to build a similar folded Franklin antenna, then you can follow a similar technique — provided the antenna will be mounted indoors, perhaps in an upper room or in the roof space. Just make sure you have enough headroom for this 8 foot tall antenna!

If you decide to mount the antenna *outdoors*, then more attention will be needed to waterproofing. You could mount the entire antenna within a length of wider diameter fiberglass or PVC tubing, with a suitable end cap to cover the top. Additional dielectric material around the antenna may reduce the resonant frequency even further, so be prepared to adjust the dimensions. You should also take care with securing the wire antenna to the central support — nylon ties might be better than vinyl tape alone for good long-term stability.

Another approach would be to use bare copper wire inside a fiberglass, PVC or polyethylene tube, held with plastic spacers, just large enough to slide inside the tube. This technique was described in *PCARA Update* for October 2007, where European-style barrier strips from Radio Shack were used to support a Slim-Jim antenna inside a length of ¾" ID PVC pipe. This method of construction is similar to commercial antennas where molded plastic spacers and polyurethane foam are used to hold the folded wire elements in place within a fiberglass tube.



Folded Franklin as built.



Folded wire sections extracted from a Comet GP-9 antenna, showing the white PU foam and black plastic spacers which hold the wire elements in position in a fiberglass tube.

Be prepared to adjust the wire section lengths depending on your use of bare or insulated wire, and on your choice of plastic pipe for the outer radome. You will also need to adjust the matching coil for minimum SWR as described earlier.

- NM9J

Electronic waste disposal

New rule

Beginning January 1, 2015 consumers in New York State can no longer dispose of electronic equipment in landfills, waste-to-energy facilities, in the trash, or at curbside for trash pickup. This is because toxic material present in electronic products can pollute the air after incineration and contaminate groundwater when buried in landfills.

The change is part of New York's "Electronic Equipment Recycling and Reuse Act" which was signed into law in 2010. The Act took effect in several stages, including — in 2011— a requirement that manufacturers must accept electronic waste they manufactured themselves, as well as waste from another manufacturer when an item is being replaced. Restrictions on



New York recycles.

disposal of electronic waste began in 2011 for manufacturers and retailers. From January 1, 2015, the electronic waste disposal ban applies to *all* persons in the state, including *individuals* and *households*.

The exact wording of the sections that came into effect on January 1 are as follows:

§ 27-261 I. Disposal ban.

...

3. Beginning January first, two thousand fifteen, no individual or household shall place or dispose of any electronic waste in any solid waste management facility, or place electronic waste for collection which is intended for disposal at a solid waste management facility or hazardous waste management facility in this state.

...

§ 71-2729. Enforcement of title 26 of article 27 of this chapter.

l. a. Any consumer, as defined in title twenty-six of article twenty-seven of this chapter, who violates any provision of, or fails to perform any duty imposed by, section 27-261 I of this chapter, shall be liable for a civil penalty not to exceed **one hundred dollars** for each violation.

Items of electronic waste in scope of the recycling act that *must* be accepted by the manufacturer include:

- Computers — including laptops, desktops, tablets and e-readers, televisions, cathode ray tubes, computer peripherals (including cables, cords, or wiring), monitors, electronic keyboards, mice, fax machines, scanners and printers—less than 100 lbs.

- Small electronic equipment (including cables, cords, and wiring) — VCRs, DVRs, portable digital music players, DVD players and projectors, digital converter boxes, cable or satellite receivers, electronic/video game consoles and small scale servers.

Some items that manufacturer do *not* have to accept include:

- cameras and camcorders, portable or stationary (*sic*) radios; household appliances, thermostats; hand-held transceivers; telephones, PDAs, calculators; GPS receivers and larger servers.

However, these items must still be recycled responsibly. Note that cell phones are covered by the separate NYS Wireless Telephone Recycling Act, which requires wireless telephone service providers to accept cell phones for reuse or recycling.

Where to reuse and recycle

In the Peekskill/Cortlandt area, electronic waste can be disposed of at the following locations:

Town of Cortlandt: Residents should take their "E-waste" (electrical/electronic items) to the Sanitation Department Office, 167 Roa Hook Road (just off the Goat Trail, near Camp Smith), open every Thursday 1:00 - 3:00 p.m., or 12:00 - 2:00 p.m. in July-August. Roa Hook will accept computers, faxes, copiers, CD and DVD players, phones, cell phones, televisions, microwaves, slow cookers, coffee makers, blenders, radios (with an electrical cord attached), washers, dryers, stoves and dishwashers.



Town of Cortlandt Department of Environmental Services' Sanitation Division is located at 167 Roa Hook Rd.

City of Peekskill: Residents may take items to the Department of City Services Garage at Louisa Street and Lower South Street on Saturdays, 9:00 a.m. – 12:00 noon. This facility will accept televisions, com-

puters, small corded appliances such as printers, microwaves, can openers, blow dryers etc.



Peekskill Department of City Services' Garage in Louisa Street is open on Saturday mornings for waste drop-off.

Unwanted cell phones can be dropped off at several locations including City Hall, 840 Main Street; School Admin Building, 1031 Elm Street; Field Library, 4 Nelson Ave.

Westchester County: The County's Household Material Recovery Facility (H-MRF) at the Grasslands Campus, 15 Woods Road, Valhalla, NY accepts electronic waste (e.g. computers and peripherals, televisions, cell phones, etc.) CFLs, rechargeable batteries and many other household items. Open on Tuesdays, Thursdays, and Saturdays 10:00 a.m. to 2:50 p.m. Appointment and proof of residence required. See: <http://environment.westchestergov.com/hmrf-development> .



Westchester County's newest recycling center is the Household Material Recovery Facility, located at 15 Woods Road, Valhalla, NY

Best Buy Store #1029, Cortlandt Town Center, 3105 East Main Street, Mohegan Lake. The Best Buy Electronics Recycling Program will accept most items of electronic equipment at the store. There are separate bins by the entrance door for ink and toner cartridges; wires and cables; rechargeable batteries and for plastic bags. Larger items can be taken to the customer service counter. Check the Best Buy web site for full details. Go to: <http://www.bestbuy.com/recycle> — then specify your State to see appropriate information.

Staples Store #0402, Staples Plaza, 3333 Crompond Road, Yorktown. As well as ink and toner recycling, Staples stores accept many items of office electronic equipment for free recycling. See the list at: <http://www.staples.com/sbd/cre/marketing/easy-on-the-planet/recycling-and-eco-services.html> .

Home Depot, Cortlandt Town Center has bins for free recycling of rechargeable batteries and cell phones; compact fluorescent lamps (CFLs) and plastic bags. Turn left as you walk through the main entrance.

Office Max, Cortlandt Town Center, 3131 East Main Street, Mohegan Lake, offers the free OfficeMax Ink and Toner Recycling Program.

Radio Shack stores accept rechargeable batteries and unwanted cell-phones for recycling at no charge.

Donate!

If you have recent equipment that is in good working order, you might prefer



to donate it to a voluntary organization that can resell it. Organizations willing to accept electronics and small electrical items include the Salvation Army (<http://satruck.org/donate-goods>) and Goodwill Industries, <http://www.goodwillnynj.org/donate>. Stores are available in our area at the following locations:

Salvation Army Family Store, 1022 Main Street, Peekskill, NY,

Goodwill Industries Store, 440 S Riverside Ave., Croton-on-Hudson, NY.

There are additional suggestions for donating to charitable organizations on the Westchester County web site:

<http://environment.westchestergov.com/residents/waste-reduction-res/donations>

Wipe it clean

If you *do* decide to donate an old computer, tablet, storage device, smart-phone, player, digital camera, game console or GPS receiver, remember to *securely erase* all personal data and remove any detachable media from the device before handing it over to the recycling group. Advice on erasing data from electronics is available on Consumer Reports' web site: <http://consumerreports.org/cro/2013/11/remove-personal-data-from-any-device/index.htm>



- NM9J

Peekskill / Cortlandt Amateur Radio Association

Mail: PCARA, PO Box 146, Crompond, NY 10517

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Web site: <http://www.pcara.org>

PCARA Update Editor: Malcolm Pritchard, NM9J

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Newsletter contributions are always very welcome!

Archive: <http://home.computer.net/~pcara/newslett.htm>

PCARA Information

PCARA is a **Non-Profit Community Service**

Organization. PCARA meetings take place the first Sunday of each month* at 3:00 p.m. in Dining Room B of the Hudson Valley Hospital Center, Route 202, Cortlandt Manor, NY 10567. Drive round behind the main hospital building and enter from the rear (look for the oxygen tanks). Talk-in is available on the 146.67 repeater. *Apart from holidays and July/August break.

PCARA Repeaters

W2NYW: 146.67 MHz -0.6, PL 156.7Hz

KB2CQE: 449.925MHz -5.0, PL 179.9Hz

N2CBH: 448.725MHz -5.0, PL 107.2Hz

PCARA Calendar

Sun Feb 1: PCARA Meeting, Hudson Valley Hospital Center, 3:00 p.m.

Hamfests

Fri Feb 27: New Providence ARC Auction and Flea Market, New Providence High School, 35 Pioneer Drive, New Providence, NJ. 6:30 p.m.

Sun March 8: Long Island Mobile Amateur Radio Club Hamfest and Electronics Fair, Levittown Hall, 201 Levittown Parkway, Hicksville, NY. 9:00 a.m.

VE Test Sessions

Feb 1: Yonkers PAL Ham Radio Club, 127 N Broadway, Yonkers. 2:00 p.m. Pre-register with Michael Rapp, (914) 907-6482.

Feb 1: Yonkers ARC, 1st Police Precinct, E. Grassy Sprain Rd, Yonkers, NY. 8:30 am. Pre-register with John Costa, (914) 969-6548.

Feb 7, 14, 21, 28: Westchester ARC Radio Barn, 4 Ledgewood Pl, Armonk NY. Must pre-register with Michael R. Rapp, (914) 907-6482.

Feb 12: WECA, Westchester Co Fire Trg Cen, 4 Dana Rd., Valhalla, NY. 7:00 pm. S. Rothman, 914 831-3258.

Feb 16: Columbia Univ VE Team ARC, 531 Studebaker Bldg, 622 W 132nd St, New York. 6:30 pm. Alan Crosswell, 212 854-3754.



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