PCARA Update

Volume 18, Issue 5 Peekskill/Cortlandt Amateur Radio Association Inc. May 2017

May matters

Fifteen members were in attendance for the April PCARA Membership Meeting at NYP/HVH. We covered quite a few topics and had some very productive discussions. Also, the most recent PCARA Breakfast was held on April 8, 2017 at Turco's in Yorktown Heights, NY. We had another excellent turnout with a great time had by all. Watch for future breakfasts to be announced soon. Thanks again to Jared KD2HXZ and Lou KD2ITZ for organizing these enjoyable get-togethers.

If you haven't yet had the chance, please give the **448.725 MHz N2CBH repeater** a try. It returned to the air with a vengeance on April 15th. This was made possible through the efforts of Bob N2CBH, Joe WA2MCR, Malcolm NM9J, and especially Barry K2BLB. **Thank You Gentlemen!** Please give it a try; I'm certain you'll be pleasantly surprised. Let us know what you think!

On April 16th, PCARA provided parking assistance for the 10:00 am Easter Mass at the Church of the Holy Spirit in Cortlandt Manor, NY. Directing traffic were Bob N2CBH, Al K2DMV and Malcolm NM9J. As was the case for Christmas past, the lot filled to capacity — the overflow moved across the street and into an adjacent parking lot. It might be time for a bigger lot!

PCARA has taken a club table at the Orange County Amateur Radio Club Spring Hamfest on Sunday April 30th at the Wallkill Community Center, 2 Wes Warren Drive, Middletown, NY. If you have any items that you would like to try to sell, please feel free to bring them along. For more information please visit the OCARC website at: http://www.ocarc-ny.org.

The next **PCARA Foxhunt** is going to be held on Saturday May 13, 2017 starting at 3:00 p.m. We will assemble for registration at 2:30 p.m. at the Beach Shopping Center on Dayton Lane in Peekskill, NY. The role of the Fox is to be played by Mike N2EAB. As history has taught us — Mike can be a most clever Fox, so be well prepared come May 13th. The Foxhunt is open to everyone, so please consider joining us. Rules for the hunt can be found in this month's edition of the *PCARA Update*.

ARRL 2017 Field Day is on the weekend of June 24–25, 2017, and PCARA is planning on holding its observance of Field Day activities at Walter Panas High School at 300 Croton Avenue, Cortlandt Manor, NY.

During the April 26 FYCAT workshop held at Lake Mohegan Fire Department HQ, Fred KD2GJJ took aim at the fox with this novel tape-measure Yagi. (See report, page 15.)

Organizing activities for 2017 Field Day will be a major topic for discussion at both the upcoming May 2017 and June 2017 PCARA Membership Meetings, so please bring along your ideas and suggestions. Everyone is invited and welcome to participate!

Our next regularly scheduled meeting is **Sunday May 7, 2017** at 3:00 p.m. at New York-Presbyterian / Hudson Valley Hospital in Cortlandt Manor, NY 10567. 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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Early Radio Adventures

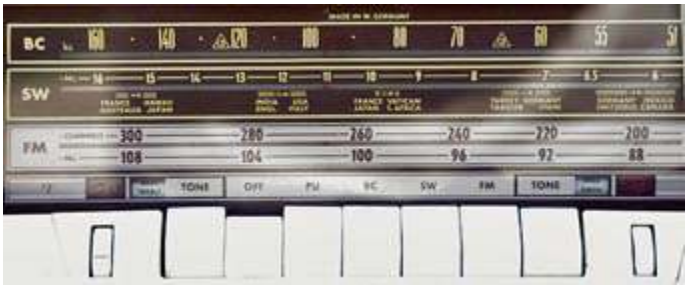
Do you remember your first time? I certainly do. It was 1962 and I was 8 years old. My family and I often visited my aunt and uncle who lived in Oyster Bay on Long Island's north shore. They lived in a big two-family legacy house built around 1900. On this visit, I discovered something new on their living room shelf: A new Grundig Majestic 2120 radio.

Grundig Majestic 2120 domestic radio receiver.

Wow. I had never ever seen anything quite like this before. It had three radio bands: BC, SW and FM, a button for a record player input, fancy tone controls and even a green tuning eye. I was mesmerized! My uncle gave me a quick demonstration. This radio certainly was majestic!

At 8 years old, I wasn't quite a radio expert but I did understand a little about the basics. Everyone was familiar with AM radio, which for most people was the *only* radio! FM was a curiosity that had nice fidelity but few listeners. I am not sure that I had ever seen a shortwave radio much less ever used one. What was this all about?

The next day, I finally had some time to experiment with this beauty. The Grundig really sounded remarkable, especially when compared to the little five-tube household radios I was used to. On each side of the piano key buttons for band switching were similar buttons to vary the tone combined with fancy gliding rotary controls to fine-tune the sound to your liking. On the left, you could choose either bass or treble. On the right, jazz or orchestra. There were little windows just above the controls that showed what mode you had selected and a little window with music notes indicating where your tone knobs were set. When the rotary control was at maximum the window would appear all red. At minimum the window would look white. In between, it looked like a little candy stripe. It was an all-mechanical display connected to the adjustment



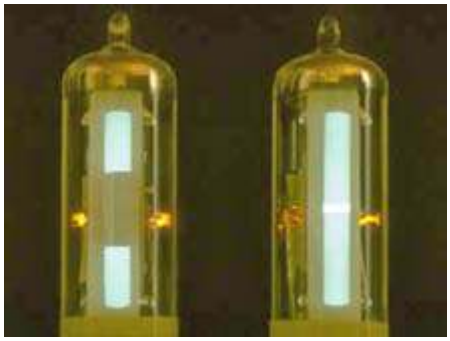
Grundig Majestic piano-key controls and tuning dial.

knob next to the piano keys. This system was complicated but very useful!

By far, the most amazing and eye-catching feature was the attractive tuning eye just left of the big volume knob. You would see the little light green luminescent bar close as the incoming signal became stronger. Any Grundig Majestic owner would want to tune in their stations with precision! When a signal was really, really strong the upper and lower green bar would actually overlap slightly making the result even brighter.

Tuning indicator left of the volume control indicates signal strength. Tone control is also visible lower right.

I learned much later this was a European EM87 tube made quite specifically for this purpose. It was a lot of fun to watch!



Philips EM87 tuning indicator included a triode amplifier for the AGC line with output controlling electron flow to a bar-shaped fluorescent target electrode.

The tube complement of the Grundig Majestic 2120 is not anything I would see in America. Besides the EM87 (6HU6) tuning bar, you would find a ECC85 (6AQ8) audio stage, a ECH81 (6AJ8) frequency converter, a EF89 (6DA6) RF/IF stage, a EABC80 (6AK8) detector designed especially for FM reception and a single EL84 (6BQ5) audio output tube. It is inter-

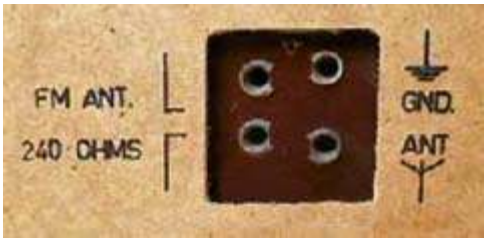
esting that every European tube used in this radio has a North American equivalent. This Grundig uses a four diode full-wave bridge for rectification in its power supply. Needless to say, EM87 tubes are rare and coveted in the year 2017!

My immediate impression of the Grundig's short-wave band was rather mysterious. Pressing SW allowed you to hear radio stations between about 6 and 16 megacycles covering the 49, 41, 31, 25 and 19 meter broadcast bands. The beautiful glass panel tuning dial enticed you with suggestions of all the places you could go. The legend showed worldwide destinations: 49 meters offered Germany, Mexico, Switzerland and Canada. 41 meters was home to Turkey, Germany, Tangier and Spain. 31 meters had France, Vatican, Japan and South Africa. 25 meters gave us India, USA, England and Italy. 19 meters showed France, Hawaii, Australia and Japan. Can I really hear all these places?

Close up of Grundig short wave tuning dial shows the 41 meter broadcast band (7.1 - 7.35 MHz in Europe).

My first attempts at shortwave listening were like entering a dark closet in the middle of the night without a flashlight. I had to wonder and wonder some more about what this was all about. I could hear noisy stations in the distance, some in foreign languages, but very few stations had enough strength to even effect the closing of the green signal bar indicator. What was I missing?

I finally made bold and took a look at the Grundig's back panel. It was unusual to say the least. In 1960s America, all TV and FM antennas used a 300 ohm flat cable impedance standard. The Grundig was looking for narrower 240 ohm cable. To this day I don't think I have ever seen the 240 ohm variety! There was also a couple of holes designated antenna and ground. Aha! I bet the shortwave band needs an antenna wire!



Rear panel of the Grundig Majestic had external antenna connections for AM/SW (right) and FM (left).

Most houses do not have hookup wire as a part of their hardware fix-it inventory. I had to be adaptive and creative. After a long snoop around my aunt and uncle's basement, I found the Holy Grail. It was a length of picture hanging wire! Since I did not have the proper matching adapter to connect the wire to the radio, I carefully folded the end of the wire over and over a few times until I had just the right width so the wire would stay connected. Using a small screwdriver, I delicately pressed the wire into the connector and then played the wire out of the bookshelf and thumbtacked the end to keep it in place. Not bad for an eight year old! (I understand that the proper connectors for these European antenna sockets are now very rare and hard to find.)


European broadcast antenna connectors, non-polarized on left, polarized on right.

Granted, a 15 foot piece of wire mounted indoors around a bookcase is not exactly an expert shortwave antenna but it made such a difference. Oh, the things I could now hear! The dark closet of shortwave suddenly had a bright light above it! Now I had a quest. What on Earth was shortwave all about? Could I really hear Australia? No doubt, this new facet of radio would be amazing to discover!

Back in 1962, the shortwave bands were alive with all sorts of exotic stations from near and far. The Voice of America, BBC Overseas Service (This is London!) and Radio Moscow were omnipresent and dominant. Certainly, there was Radio Nederland, Switzerland Calling, Deutsche Welle, RAI Italia and many other stations from Europe and even Africa. HCJB came heralding in from Ecuador. "Local" stations appeared from Canada especially CFCF (CFCX) 6005 kilocycles from Montreal. The possibilities seemed endless!

BBC External Services QSL — now known as the BBC World Service.

From an engineering point of view, the mid 1960s saw the beginning of a new era in shortwave broadcasting. Up until this point, only the most established stations approached 50,000 watts of transmit power. Most stations were happy operating at 10 or 20 kilowatts and sometimes quite a bit less. Shortwave listening was much more of a challenge and stations were packed into the broadcast band segments of the dial as close as every 5 kilocycles. Especially in the early evening on

America's east coast where I live, shortwave could be the home of quite a pile-up of stations longing to be noticed!

My first adventures were memorable. In general, there was a lot going on with multitudes of stations to be heard and lots of noise, as well! Quickly turn the tuning knob and you would get quite a gurgle of the sound of stations flying by. One thing became obvious immediately. You had to tune very, very slowly and carefully to hear a station clearly. I now really understood why the tuning eye was included. The Grundig's beautifully balanced flywheel tuning and enormous tuning knob were quite appreciated. The volume and tuning knobs had such a remarkable feel giving you a sense of command like no other.

Grundig flywheel tuning control.

A day or two later, I first heard the sound of amateur radio. More than likely, I had tuned in to the amateur 40 meter band between 7200 and 7300 kilocycles. I heard a group of men talking back and forth about radio gear, reception and everything else you might expect. The transmit mode was good old reliable AM and their sound was as pure as any professional broadcast. I felt as if I had somehow rigged up a way to interlope on their conversation, like a spy tapping across an enormous telephone interconnect!

I recall so clearly having the perspective of the eight year old I was! I said to myself "I should be very, very quiet just in case they can hear me listening!" and I did! I really was amazed. Amateur radio was something that I had never heard or witnessed before. These were mature, trained and sophisticated radio professionals. The men of almighty radio! (It really did sound this way to me!) I tuned in again and again. Wouldn't you?


Be very quiet, in case they can hear me listening...

Besides providing me with the miracle of shortwave, the Grundig Majestic made me appreciate a much higher quality of sound. Listening to regular local broadcasts sounded so full and rich. Although this was a monophonic radio, the full-bodied sound was beyond compare to me. The Grundig was also very, very sensitive on the 'BC' medium wave band and could pick up stations from far, far away that I had never heard before. I don't think I ever ventured into experimenting with the FM band. It would be five years or more before FM actually became a popular medium due to an American rule change insisting that FM stations could no longer rely on simulcasting their AM counterparts to fill the air with sound.

A set of my own

Three years later in 1965, my parents rewarded me with a spectacular gift: A Hallicrafters S-120 four tube four band shortwave receiver of my very own. One of my very first memories with the S-120 was discovering the amazingly powerful and broadband blast of LORAN signals from about 1900 to 2000 kilocycles. On the S-120, 'Band 1' was AM medium wave broadcasts. Band 2 was roughly 1500 kilocycles to 4.5 megacycles. Band 3 was 4.4 to almost 12 megacycles and band 4 was about 11 to 30 megacycles. What would I hear on all those frequencies?


Hallicrafters S-120 shortwave receiver.

The S-120's 'Band 2' was my first taste of the world beyond what the Grundig could provide. At the time, there were very active marine communications going on between 2 and 3 megacycles especially the two-way radiotelephone chats provided by loud signals from "New York Radio." You would hear people calling home or their businesses from their yachts or aboard ocean liners. Regular ship to ship and ship to shore communications were also easily heard on about half a dozen other frequencies. The chatter here was so active and carried for sometimes a hundred miles or more making it sound like a CB radio at the height of that band's popularity. It was great fun to listen to!

'Crystal' radio

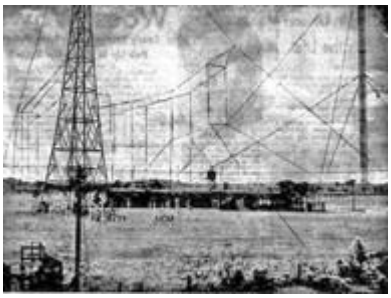
I even had a couple of experiences where I heard shortwave *without a radio!* Another aunt and uncle of mine lived in Schenectady, New York near Albany. They had a nice ranch house located on Duanesburg Road, that was quite near to a vast meadow with big antenna towers on it. A vast patchy forest went on for acres and acres behind their house with lots of fine gravel and rock dust. There was no shortage of quartz and granite and the silt at your feet would often sparkle.

My cousins would sometimes tease me about the ghosts in the woods. As a little kid, I would, of course, believe them. "Sometimes you can even hear the ghosts talk, if you listen carefully enough." Believe it or not, they were correct!


Schenectady, New York
1/8/48
M r.
General Electric's Around-the-World Broadcasting Service acknowledges with thanks your communication reporting reception of station WGEA
WGEO X , operating on a frequency of
15330kc. on 7/31 1947 .
WGEA operates on the following frequencies: Beamed to
11:15AM-2:00PM 21590kc Europe
2:15PM-6:05PM 11770kc Europe
8:00PM-10:00PM 11810kc Brazil
WGEO operates on the following frequencies:
11:15AM-6:00PM 15330kc Europe
7:00PM-12:00Mid 9525kc N.So.American
GENERAL ELECTRIC
SCHENECTADY, N. Y., U.S.A.

1947 QSL card for General Electric's WGEO SW transmitter at Schenectady, NY.

A nearby broadcast facility was the source of the phantom sounds. It was The Voice of America's powerful shortwave station originally designed and used by General Electric. GE had built the plant in 1923 and continued to broadcast with it through World War II. When the war ended, GE rented the facility to The VOA. I understand the broadcasts were sometimes as powerful as 100 kilowatts. Wow.


VOA antennas, Schenectady.

The mysterious voices could be heard on misty and damp foggy days. When the combination of moisture and conductivity of the rocks became just so — you really could hear The Voice of America! It was an eerie muffled kind of sound but you could hear voices change and sentences end. It was enough to scare a little child very, very well. I know! It was beyond creepy! The power of a hundred thousand watts of RF!

Majestic memory

I will always remember that Grundig Majestic 2120 radio with great fondness and warm memories. It was very much like the first time you ever sat down and played a fine piano or cruised on a beautifully constructed sailboat. Almost 60 years later, I still find myself with big smiles when I recall its big sound and performance. I would guess it cost a dear penny but it was worth it. What a radio!

Until next month, 73s and dit dit de N2KZ 'The Old Goat.'

Easter Sunday parking

PCARA received a request from Kathy, (XYL of George N2LJO) to once again supervise parking at the Church of the Holy Spirit in Cortlandt Manor for the 10:00 a.m. Easter Sunday Mass on April 16. This would be similar to our previous efforts on Christmas Eve and during the Jubilee Celebrations last year.

Shortly after 9:00 a.m. Greg KB2CQE, Bob N2CBH, Al K2DMV and NM9J arrived at the church where we received a short briefing from Fr. John. We were advised that parking on the grassy area beyond the upper parking lot would be possible this time as recent dry weather had allowed the ground to dry out. We were also told that parking on the approach circle was allowed — provided it did not block access.

Vehicles began arriving shortly afterward so we were busy guiding parishioners to empty spaces and making sure that vehicles with a 'disabled' tag could park close to the church entrance. The pace picked up around 9:40 a.m. with Greg having to guide people to spaces on the grassy area. All too soon the grounds filled up and the message came down by radio that all parking lots were completely full.

Your editor walked down to the Rt. 202 entrance with a traffic cone to prevent further vehicles from entering. I was soon joined by Al, Bob and Greg.


Greg KB2CQE, Bob N2CBH and Malcolm NM9J at the Rt. 202 entrance for parking supervision. [Pic. by Al K2DMV]

Vehicles began parking in the empty area across the street and in the parking lot for nearby doctors' offices. By then, the church was completely full and latecomers had to decide whether to take in a later service or try to find another church.

Handi-talkie operation on 146.565 MHz simplex covered the Church grounds very well. We established that the newly relocated N2CBH/R repeater also covered the area. - NM9J

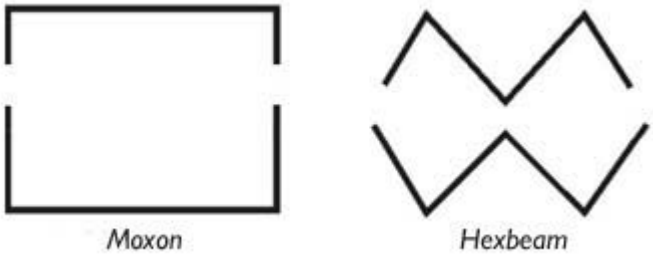
20 meter Yagi and 40 ft tower for $100? – K2WPM

Tired of never being able to break into those 20 meter DX pile-ups with my 40-foot dipole, I wanted to build a directional antenna. For various reasons, I had some rather tight parameters:

- The antenna must be light, preferably around five pounds;
- I'd like to get a little bit of gain, maybe 3dBd (decibels above a dipole signal);
- I'd like to get some front-to-back, to reduce the noise level; and
- The whole thing can't cost more than $100.

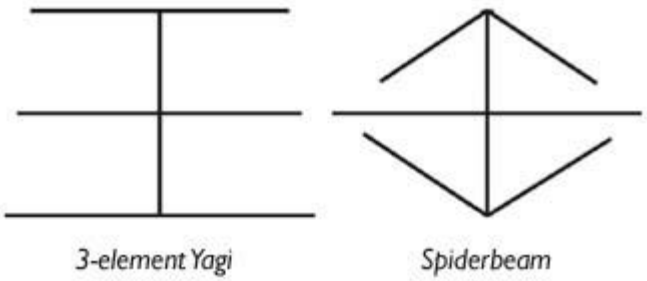
And I'd like to get the antenna at least 40 feet high... Right.

Well, I looked at lots of homebrew antenna projects. The search narrowed down to the **Moxon**, **Hexbeam** and **Spiderbeam**.



Two-element Moxon beam antenna alongside a Hexbeam antenna. Driven element is at the top, reflector below.

All these are directional wire antennas, light in weight and inexpensive to build. I found it impossible to choose among these antennas based on various published performance reports. All are reputed to provide about 6dBi gain and about 15dB front-to-back ratio. But the so-called Spiderbeam has *three* elements while the others only have two. How's that for an arbitrary decision-making criterion!



The Spiderbeam antenna (right) is derived from a 3-element Yagi by bending the reflector and director. Director is shown at the top.

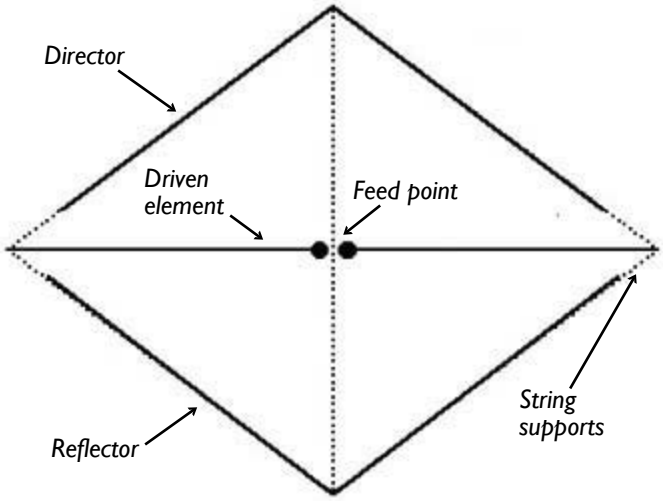
Spiderbeam aka Bird Yagi

The so-called Spiderbeam was originally named the **Bird Yagi** after Gordon 'Dick' Bird, G4ZU (SK) — according to an article by the eminent antenna guru L.B. Cebik, W4RNL (SK). See W4RNL's nice article comparing the Bird Yagi with other lightweight Yagis: http://www.qsl.net/rz1zr/antenny/bag/bag.html. He concludes the Bird Yagi should provide 6.5dBi forward gain and 10-14dB front-to-back (F/B) ratio, with about 11dB side rejection for the 10 meter version modeled in free space by W4RNL.

Others suggest that when ground reflections are taken into account, this antenna can produce 10.5dBi gain, with 26dB F/B ratio at a height of 15 meters. See: http://www.qrpblog.com/2013/02/lightweight-beam-antennas-moxon-vs-spiderbeam.html .

The Spiderbeam Company predicts about 6.7dBi forward gain and 14-20dB F/B ratio in free space. When mounted at a height of 15 meters above ground, forward gain increases to 11.7dBi. Pay a visit to: http://www.spiderbeam.com/ and take a look at the technical documentation provided by DF4SA.

Here's a graphic of what it looks like.



Practical version of a Spiderbeam antenna has the three wire elements supported on strings (dotted lines). The strings are suspended in a diamond shape between the ends of four fiberglass spreaders.

The concept is to reduce the size of the antenna by folding the director and reflector ends in toward the driven element ends.

Sizing for 20 meters

But this is a LARGE antenna. I calculated the following dimensions for the respective half-elements, starting with a dipole measured for 14.200 MHz, and (a) adding 5% for the reflector and (b) subtracting 5% for the director:

Spiderbeam dimensions for 20 meters

Director	15 feet 8 inches	(each side)
Driven element	16 feet 6 inches	(each side)
Reflector	17 feet 4 inches	(each side)

This means the spreaders for the driven element must be about 16½ feet each... a 'wingspan' of 33 feet. For the sake of balance, I decided also to use the same size for the other two spreaders. (These will hold the midpoints of the director, and of the reflector elements, respectively.)

Extensive searching on the Internet and along random aisles at Home Depot led me ultimately to select the Shakespeare® Wonderpole® Fishing Rod, a 20-foot telescoping Crappie pole. These cost about $21.00 each at Walmart — which ate up almost 90% of my budget. (In hindsight, I think I could have bought the 16½ foot lengths and done fine, saving a few dollars each). The poles collapse to about 48 inches for easy travel, and weigh in at about one pound each. I love them!

Shakespeare Wonderpole Crappie Rods are multi-piece telescopic fishing poles for bream and crappie complete with line keeper and fluorescent colored tip.

The greatest design challenge was to construct a central "hub" on which I could rest four 20-foot poles, on a central pipe that would serve (a) on the bottom to slide onto a mast and (b) on the top to attach vertical hangers to give support to the spreaders. The following innovation was designed from a length of 1½ inch I.D. (inside diameter) PVC pipe scrap, and four steel shelf support brackets.

Mount for the fiberglass spreaders in David's Spiderbeam consists of four shelf brackets bolted to a length of 1½" PVC pipe. [K2WPM pics.]

To hold the four crappie pole spreaders, I used 1½" hose clamps.

To give some rigidity to this frail contraption, I devised another set of innovations: **weed-wacker line** colored red is used to support all four spreaders, tied back to the central hub, i.e. as 'stays.' In addition, a different color (purple) weed-wacker line is used to connect all four spreaders horizontally at a predetermined length of 13 feet 3 inches, as horizontal stays. The weed-wacker lines are all pre-cut to specific lengths, and the ends are melted into electrical connectors for ease of connection/ disconnection.

Each fiberglass spreader is supported from the central hub by a length of red weed-wacker line. The ends of the four spreaders are kept in a square configuration by purple weed-wacker lines. Electrical ring connectors are used at the ends.

The weed-wacker lines are neatly stored in separate baggies, as are the three wire elements.

Red and purple weed-wacker lines plus wire elements for the Spiderbeam antenna are stored in plastic Ziploc® bags.

Assembly

The fiberglass spreaders are telescoped out, with electrical tape wrapped around each section to prevent the rod from collapsing back into itself. After the vertical and horizontal stays are attached, the wire elements can be connected. I used 18 gauge speaker wire for the elements. To facilitate ease of connection/ disconnection, I soldered the ends into electrical contacts. See the image of the assembled antenna overleaf.

The fully-assembled antenna is shown on the ground, temporarily mounted on a tripod stand. [K2WPM pic.]

My 40 foot 'tower'

I tried the homebrew Spiderbeam at about 20 feet with disappointing results. I needed a 40 foot tower! Having already spent $98.75 out of my $100 budget, I decided to hoist the antenna hub up to the point where my fan dipole had hung — yes, a directional Yagi antenna, hung from a rope, run between two 60-foot trees. I've never even heard of this being tried, so why not?

The antenna weighed in at about 6½ pounds, so I gave it a try. The ⅜" poly rope easily handled the load, together with about 40 feet of LMR-240 coax dangling below. My 40 foot tower was free!

Spiderbeam antenna suspended in the air between two tall trees. The thin wire elements were visible in David's original picture, but only the spreaders and supporting lines can be seen at this resolution. White line at left is an aircraft trail.

I thought ahead and attached a string to the 'tail' end of the Spider, so that I could rotate the antenna from the ground. A variation on what we used to call the "Armstrong" method. It worked like a charm and I weighted the string down with a brick.

The results

During the 2017 CQ WW WPX SSB Contest in March, I tried out the Spiderbeam, noting signal reports from stations I had worked, or tried to work, a few hours earlier with the dipole. I pointed the antenna this way and that, comparing signal strength in S-units, and noting the much-less-noisy band with some decent front to back ratio.

My best estimates are as follows:

Gain (receive) — very little receive gain over my dipole, maybe one S-unit, if that.
Gain (transmit) — about one S-unit better than my dipole; more important, with one exception — Uruguay — I worked every station I could hear, all afternoon.
Front to back ratio — about two S-units difference in signal strength observed on received signals. But the significant reduction in background noise was the real treat.

My antenna analyzer said that I had cut the driven element a little too long, with an SWR of 1.1:1 at 13.9 MHz. But even at 14.2 MHz, SWR was about 1.8:1, so I'll adjust it next time.

Other resources

Homebrew Spiderbeam – http://va7st.ca/2016/01/the large-and-powerful-spider-beam/ . Scroll down for the original 2003 design.

Building a Homebew Spiderbeam – http://home.exetel.com.au/auriga/AR/Tech/sb/Spiderbeam.html

Spiderbeam high performance antennas by DF4SA: http://www.spiderbeam.com/ — a great company; I cannot afford $400 - $500 for a commercial Spiderbeam, but they appear to be fantastic quality. Full construction plans are available for download. Spiderbeam's U.S. Distributor: http://www.spiderbeam.us/

Complete Spiderbeam kit from DF4SA includes fiberglass sections, aluminum tubing, kevlar guy line, Wireman copperweld and all hardware.

Original article by 'Dick' Bird G4ZU: "New techniques for rotary beam construction", The ARRL Antenna Compendium Volume 2, pp 58-60.

– 73 de David, K2WPM (formerly KD2IRA)

Medium-frequency memories - NM9J

When I was first licensed during the 1960's I was living at the family home in Southport, in northwest England. (For more about my early days on the air see 'Gaining gold", *PCARA Update* September 2016.)

Trains and boats and planes

From a radio point of view, Southport was in an interesting location. The seaside town sits at the edge of the Irish Sea, on the southern side of the Ribble estuary. The River Ribble flows through Preston, then onward past Southport, separating SW Lancashire from the Fylde Coast, where the seaside town of Blackpool is situated 10 miles to the north.

Fifteen miles south lies the great port of Liverpool, on the bank of the River Mersey. Southport has an electrified commuter rail line into Liverpool, and another commuter line to Manchester, where my father used to work. A third rail line from Southport to Preston was closed in 1964 as a result of cuts imposed by Dr. Beeching. Thanks to the rail lines, Southport was an important dormitory town for thousands of people who commuted to Liverpool, Manchester, Wigan and Preston during the working week.

Map showing the location of Southport, plus nearby towns and airfields in northwest England.

In addition to road, rail and sea, Southport also had a connection with air travel. On the southwestern edge of town was RAF Woodvale, a former World War II base built to house night-fighters defending the city of Liverpool against air attack. During my time in Southport it retained an important role as a base for training new pilots — both military cadets in jet trainers and civil aviation pilots in light aircraft. Five miles out of town was the former Burscough Naval Air Station — another airfield constructed during World War II. It was no longer used for flying, but the control tower was still present along with its non-directional beacon transmitter. This aeronautical beacon identified continuously in Morse code as **ORM** (– – – · – · – –), for Ormskirk, the nearest town. Frequency was 315.5 kHz, at the low end of the 280-530 kHz medium frequency band used for marine and aeronautical beacons in Europe.

Control tower at Burscough Airfield, with MF beacon.

Burscough airfield played an important role in my own education. Since the runways were still intact, and there was access from a nearby road, it was a good place for learning to drive — well out of the way of serious road users. I had my first driving lessons at Burscough under parental supervision — along with several classmates.

Two more airports were nearby. Across the River Ribble stood Warton Aerodrome, on the north bank of the estuary. This was another World War II site, originally used as a depot for US Army Air Forces as they ferried aircraft across the Atlantic into the U.K. Postwar it became a major aircraft design and test facility for English Electric, and its successor British Aircraft Corporation and British Aerospace (BAE). I came across a member of BAC's military aircraft design team during evening classes in Southport.

Further north was Squires Gate airport, renamed Blackpool Airport. This was a base for short-haul commercial flights, especially to the Isle of Man and Ireland. During an amateur radio transaction, I paid a visit to Mike G3TSL who was working on aircraft electronics at Blackpool Airport. Mike showed me how the all-transistor automatic direction finder (ADF) receiver in a small private plane could be tuned to an appropriate beacon transmission, the directional antenna below the aircraft would then rotate automatically and the bearing indicator on the instrument panel would show the direction to the

Control tower at Squires Gate airport.

transmitter. (For more on ADF and other navigation aids, see the article "Aviation systems" by Bob, N2CBH in the *PCARA Update* for April 2014.)

Blackpool Airport had a radar installation nearby which was part of the U.K. air defense and air traffic control system. At the time there was a large rotating array powered by two Marconi 50 cm primary radars with a peak output power of 500 kW. Frequency was 600 MHz, just above UHF TV channel 36. Blackpool amateurs told me a story that when there was a temperature inversion over the Irish Sea, the Irish coastline would begin to appear on Blackpool's radar display. One of the radar operators would then inform his friend — a radio amateur — that conditions were good at UHF, and it was time to point the beam west toward Ireland! Possibly the most expensive DX-alerting system of all time.

Marconi 264A 50 cm radar installation at St Annes, near Blackpool.

Because of the presence of 50 cm radar, UHF channels 35-38 were not initially used for TV broadcasting in the UK. Our local GPO Radio Inspector said that homes close to the Blackpool radar installation had to install coaxial stubs on their TV downleads in order to filter out strong radar pulses. Away from the airport, channels 35-38 were put to good use for video cassette recorders, which could employ the frequency for RF modulator outputs — in the days before SCART and HDMI cables. Eventually, the UK Civil Aviation Authority stopped using 50 cm radar and transferred their operations to 23 cm. When the UK's "Channel 5" television was launched in 1997, it employed analog PAL transmission on UHF channels 35 or 37. A great deal of work had to be carried out, retuning existing VCRs and set-top boxes away from those channels.

Medium for marine

As recounted in "Gaining gold", my early amateur radio operation from Southport was confined to "top band" or 160 meters. I had a home-brew amplitude-modulated transmitter, connected to a 120 foot long-wire antenna, folded around the back yard. With my station only 2 miles from the sea, the best propagation was across salt water, northward to Blackpool, south toward Liverpool or west along the North Wales coast. Propagation across the Irish Sea was excellent, with signals easily reaching the Isle of Man.

The 160 meter band, 1.8 - 2.0 MHz, was shared with Maritime Radio and navigation aids such as Decca Hyfix and Loran (Long-range Navigation). Marconi definitely knew what he was doing when he established marine communications using "wireless telegraphy" (WT) in the 600-1000 kHz region. Those frequencies propagate with ease across salt water, using ground wave by day and sky wave at night. Wide-band spark transmissions in this region were replaced by modulated CW (MCW) transmissions on specific frequencies in the range 410- 510 kHz using hand-keyed Morse. When radiotelephone service was introduced — first on AM, later on SSB — it made use of medium frequencies around 1.7 - 3.0 MHz.

I was well aware of the "Ship's Medium Range Radiotelephone Service" because our local Coast Station, Anglesey Radio, callsign **GLV** had one of its fixed frequencies within the 160 meter band at 1925 kHz. This was often used for phone-patch operation, with the ship transmitting higher up the band on a frequency such as 2009, 2104, 2527 or 2548 kHz. Typical conversations from ships coming into port were about stores or spare parts that would be needed to effect a repair. Occasionally there would be an emotional conversation between a sailor and his sweetheart left onshore. I used to wonder whether the people involved realized how little privacy they had when Anglesey Radio was transmitting every word unencrypted across the Irish Sea with half a kilowatt of AM.

The original coastal radio station for Liverpool was established in 1903 by the Marconi Company at Seaforth Sands in North Liverpool, near what is now the Seaforth Container Terminal. The station was known as "Seaforth Radio" with the early callsign **LV** (Liverpool), later **GLV**. Not only did the station communicate with cargo and passenger ships arriving at and departing from the Port of Liverpool, but it also had a school nearby for sea-going telegraphists, later to be known as **Radio Officers**. Seaforth Radio was taken over by the General Post Office in 1909, along with other British coastal radio stations at Caister (Norfolk), North Foreland (Kent), Niton (Isle of Wight), Lizard (Cornwall), Rosslare (Wexford), Crookhaven (Kerry) and Malin Head (Donegal, now in Eire). The Seaforth station was moved half a mile inland by the Post Office in 1911.

Seaforth Sands wireless telegraphy station established by the Marconi Co. in 1903.

Seaforth Radio coast station continued in service for several decades, using a wireless telegraphy fre-

quency of 447 kHz. According to the Post Office Guide of 1920, the rate for radiotelegrams transmitted via Seaforth Radio was 3½*d* (penny) per word, with a minimum of 2*s*. 11*d*. The Post Office's short-range radiotelephone service for coastal ships was opened from Seaforth in 1934.

Local amateurs in Southport told me that broadcast radios with intermediate frequencies (IFs) near to Seaforth's 447 kHz MCW transmit frequency could be adversely affected, even though the station was ten miles south. Along with increasing levels of urban noise, this may have been one of the reasons for moving the station to the Island of Anglesey in 1960. The call-sign GLV went along with the move. At the time, Anglesey Radio was the most modern and best equipped of the Post Office coastal radio stations.

Map shows the location of Anglesey Radio near Amlwch in North Wales.

Club visit

In 1977 I joined members of Ormskirk Radio Club for a visit to Anglesey Radio. It was a fine weekend afternoon in October, with very little radio traffic taking place — so the station operators (who were mostly ex-seagoing radio officers) were happy to show us around the station and answer all our questions. These were the same Post Office employees who administered the GPO Morse Test, required for Radio Amateurs in the UK, where applicants had to demonstrate sending and receiving Morse code at 12 wpm before a 'Class A' license was issued.


Visitors arriving at Anglesey Radio station, GLV in 1977. The sign by the gate reads "POST OFFICE RADIO STATION AND TELEGRAPH OFFICE", with a Welsh translation underneath.

Anglesey Radio was in a near-perfect radio location at Amlwch on the northeast corner of the Isle of Anglesey near Point Lynas, overlooking the Irish Sea. Transmit antennas for 410/447/500 kHz MCW and 1.9-2.8 MHz MF were located just outside the station. The wireless telegraphy antenna consisted of a Marconi wire "T" suspended between the two tall masts. The radiotelephone service on 1.9-2.8 MHz could run AM or SSB, with full duplex when necessary, so the receive antennas were located a couple of miles away across the bay and connected through a long length of nitrogen-pressurized coaxial cable. The remote antennas fed several Eddystone EC958 communication receivers inside the station.


Anglesey Radio MF transmit antennas consisted of two vertical masts with a Marconi "T" suspended between them. Guy wires were broken up with insulators. The spacer for one end of the multiwire flat-top part of the T-antenna is just visible.


Eddystone EC958 solid-state communications receiver as used at Post Office Coastal Radio Stations.

Those Eddystone EC958 receivers were continuously tunable over a range of 10 kHz-30 MHz so that if a ship's transmitter was slightly off-frequency, the coast station operator could compensate. They were mounted in a wrap-around console with everything to hand for copying telegrams and phone-patching to the GPO telephone network. There was a GPO-standard large brass key for sending CW — though we noted that the operator had clipped his own solid-state electronic keyer across the terminals. High-tech in 1977!

One of the operator consoles at Anglesey Radio in 1977. Note the nixie-tube digital clock on the console top right and twin Eddystone EC958 communication receivers set into the console by the operator's left shoulder.

Coastal radio stations had a serious side to their operation as they kept continuous watch on the emergency frequencies of 500 kHz wireless telegraphy, 2182 kHz phone and (where equipped) Channel 16 VHF FM. If a vessel was in difficulty it could call for assistance. "Silence periods" were assigned around each hour — times when normal traffic was prohibited and the air was clear for emergency calls. The coastal radio operator would receive the Mayday call then co-ordinate with ships and the Coastguard to effect a rescue.

One of the transmitter racks at Anglesey Radio. Just visible on the right, Brian G3SZV and David (then) G8HUP.

Marine Radio Officers on board sea-going ships were responsible for communicating with coastal radio stations and other vessels for emergency and routine traffic. Once they had left coastal waters and were out of range of the medium frequency coast stations, they would change to high frequencies, working back to Portishead Radio near Bristol in southwest England. The Radio Officer was also responsible for keeping the vessel's radio equipment in good working order, and for other electronic systems aboard ship.

But the writing was on the wall for these highly skilled Radio Officers and their counterparts at the coastal radio stations. Maintaining a corps of operators who could man a dozen radio stations around the clock was an expensive undertaking. Small craft were being equipped with VHF-FM radios or relying on mobile phone coverage close to shore. Larger vessels were being equipped with INMARSAT satellite communications which could operate from anywhere in the world, independent of location, time of day or sunspot conditions. The Global Maritime Distress and Safety System (GMDSS) combined satellite communications with NAVTEX for dissemination of navigational warnings on 518 kHz and Emergency position-indicating radio beacons (EPIRBs) to ensure that vessels could always communicate when they were in danger. These systems could be operated by the ship's officers without any knowledge of Morse Code or any specialized radio training.

During the 1980s UK Coast Stations were consolidated, with some being remote controlled from a central location and others closing down. Anglesey Radio closed in December 1986 while the last manned station for coastal radio and central control — Stonehaven, GND (near Aberdeen) — shut down in June 2000. Land-based monitoring of emergency frequencies — mainly on VHF — was taken over by Her Majesty's Coastguard.

The original Anglesey Radio building near Amlwch is now a private home.

The 1960-vintage Anglesey Radio building is still present in its excellent location on the northeast tip of the island. It is now a domestic home named 'Pen y Gogarth', minus transmitters, receivers and those wonderful seaside antennas.

For more information about the UK Coastal Radio Stations see: http://www.coastalradio.org.uk/ and http://www.maritimeradio.pro/uk/index.htm .

- Malcolm, G3VNQ, NM9J

PCARA Foxhunt Rules

Saturday May 13, 2017

1. Transmission: FM simplex on 146.565 MHz, horizontally polarized.

2. Transmissions start at 3:00 p.m. for 5 minutes, followed by 5 minutes off. Second transmission commences at 3:10 p.m. 3 minutes on, 7 minutes off. The fox will not move during this time. This cycle repeats at 10 minute intervals until the last transmission ends at 4:30 p.m. when the fox will announce its location.

3. The opening transmission will include a time check for watch synchronization.

4. All contestants who wish to be eligible for a prize must book in at the **Beach Shopping Center parking lot***, in Peekskill before the start. Contestants will count as one team if more than one person occupies a car. (i.e. if three in a car, they don't get first, second and third prize.)

* on the far west side, near Jo-Ann/CVS.

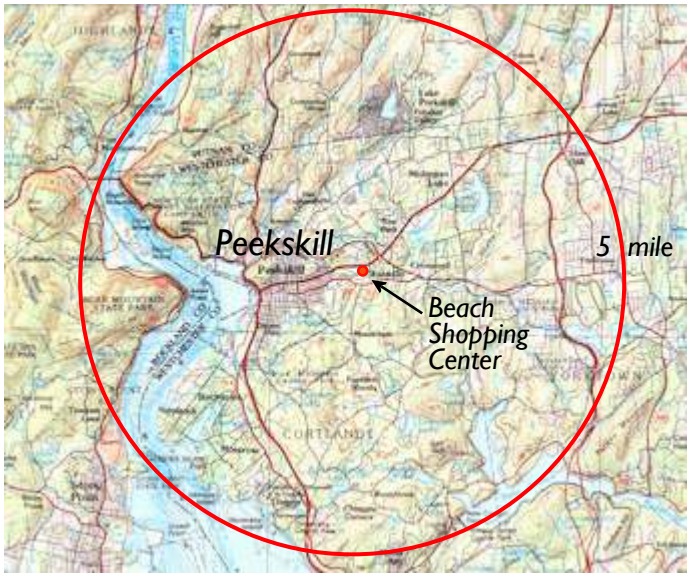
5. No contestant is allowed to move his/her car until the end of the first transmission, so take your time with the first bearing and make it a good one. The transmission will be audible from the start without a super-sensitive receiver.

6. Radio silence will be maintained by all contestants on all frequencies from the first to the last transmission.

7. No excess mileage penalty will be incurred but all contestants are reminded at all times to stay within the law and observe speed limits, parking restrictions etc.

8. The fox will be hidden not more than 5 miles from the start. The location of the fox will not be on property which is inaccessible by car.

9. Upon a contestant finding the fox, please do not shout or in any way give the location away to other contestants. Report your name/callsign to the fox and retire to the place of refreshment immediately. This will ensure that other contestants do not discover the fox because a group of people is hanging around nearby. It is requested that you maintain radio silence even though the fox has been found and the fact that you have found the fox should not be revealed to anyone until the place of refreshment has been reached.



The fox will be hidden no more than 5 miles from the start.

10. The first competitor to locate the fox and positively identify him/her will be presented with a certificate. This competitor will be invited to assume the role of fox for the next foxhunt event.

11. Competitors should convene from 4:30 p.m. at the place of refreshment, which will be announced on-air by the fox.

Rules adapted from Bury Radio Society Fox Hunt
– Malcolm, NM9J

NY QSO Party results

Results of the 2016 New York State QSO Party appeared in early April on the web site http://nyqp.org, sponsored by the Rochester DX Association.

According to the NYQP report, "We had 261 logs this year with 117 from New York, 122 stateside, 12 from Canada, 4 DX and 6 check logs. This year's club scoring was competitive with the Hudson Valley Con-

Lou KD2ITZ and Joe WA2MCR operate for PCARA during the 2016 NY QSO Party.

testers Club taking the top prize with 736,276 cumulative points, 6,449 QSOs and 18 logs for NYS. The North Coast Contesters Club taking the US/VE Club title with 203,479 points, 1,649 QSOs and with only 3 logs."

As reported in the November 2016 *PCARA Update*, Peekskill/Cortlandt Amateur Radio Association took part in the NY QSO Party on October 15, 2016 from Joe, WA2MCR's location. Participants included Charles N2SO, Lou KD2ITZ and NM9J. Joe and the team made a total of 352 QSOs.

According to the recently-published results, PCARA had a total score of 35,690 points. Our class entry was "Multi-One Low Mixed", meaning: Multiple operators with only a single transmitted signal at a time, 5 – 100 watts, Mixed mode (CW/Phone/Digital). Scores in this class were as follows:

Station	Score	Mults	Counties	Location
New York State				
W2NYW	35,690	86	53	WES
N2BEG	35,155	79	52	FRA
W2N	25,752	74	41	MON
Other US				
WB8BSA	104	8	7	MI
K4FT	18	3	2	KY

This result means that W2NYW reached first place in the class and is awarded the winning plaque for "New York Multi-One Low Power". By a curious coincidence this is one of the two plaques sponsored by PCARA! The second PCARA plaque is for "Non-NY SSB Low Power" and this was won by Alan, KC3HEO (Meyersdale PA) with 1600 points.

NYQP sample plaque.

Joe volunteered his station score for the combined entry of the Hudson Valley Contesters and DXers (HVCDX) of which he is a member. This contribution raised the combined club score of HVCDX to 736,276 points, taking top prize of New York Club High Score.

- NM9J

N2CBH UHF repeater

As reported in the July 2016 issue of *PCARA Update*, the N2CBH UHF repeater was returned to the air in June 2016 when Bob N2CBH and Joe WA2MCR deployed the club's Yaesu Fusion DR-1X C4FM repeater at a temporary location courtesy of Joe.

The temporary location was not ideal, so in early March 2017, Bob took the repeater down in order to repackage the equipment ready for the move to a new site.


N2CBH/R UHF repeater in position in its new home.

A reconnaissance visit to the site — courtesy of Barry K2BLB — took place on March 31. The location was highly suitable so on Saturday April 15, Bob and Joe paid a second visit to install the repeater equipment. Bob had repackaged the DR-1X repeater within a slimline cabinet, with the UHF duplexer cavities mounted on top. The unit was slid into place and connected to the UHF antenna arranged by K2BLB. Initial tests revealed substantial noise on weak signals, but once the power meter for measuring RF output was removed from the antenna line, the receive situation improved.

Bob checked for unwanted signals on a spectrum analyzer using frequencies provided by Barry — the situation was satisfactory, so the repeater was opened up for general use. Early reports from N2EAB and KB2CQE/M suggested the coverage was more than adequate, especially for mobile stations running 25 watts or better.


Bob N2CBH checks for any unwanted emissions on nearby frequencies.

If you would like to check coverage of the repeater, program the following frequencies into your radio. **N2CBH/R**: output frequency 448.725 MHz, input -5.000 MHz (negative offset), PL tone 107.2 Hz.

The location of PCARA's first UHF repeater, KB2CQE/R on 449.925 MHz generally favors Peekskill and the adjacent Hudson Valley. The site for N2CBH/R is further east — providing improved coverage on 448.725 MHz within the Town of Cortlandt and adjoining areas of Yorktown.

- NM9J

FYCAT workshop

PCARA's second construction workshop took place on Wednesday April 26 at Mohegan Fire Department Headquarters, courtesy of Barry K2BLB. The event began at 6:30 p.m. with burgers and soft drinks to prepare everyone for some practical participation.

Lou KD2ITZ had arranged the 'Foxhunt Yagi Construction and Testing' (FYCAT) workshop to build a direction-finding antenna as described by Joe, WB2HOL at his web site: http://theleggios.net/wb2hol/projects/rdf/tape_bm.htm. Members were encouraged to collect the parts required from a local hardware store. There must have been substantial demand because Richard N1GIL reported that Home Depot was out-of-stock of ½" PVC 'crosses' when he went shopping.

Some members had already commenced construction while others began by cutting their ½" PVC pipe and snipping sections of 1" wide steel tape measure to the lengths specified by WB2HOL.

Lou KD2ITZ cuts sections of steel tape measure to the correct length.

The next stage was removal of paint from one end of the driven element sections so that coaxial cable and hairpin match could be soldered into place. One addition to the original WB2HOL design was winding of 6 turns of coaxial cable around the boom to act as a balun.

Mike W2IGG prepares to solder coaxial cable to his tape-measure antenna, with illumination from K2WPM's smartphone.

With the three elements of the Yagi secured to the PVC boom using hose clamps, it was time to test each antenna as it came off the assembly line. David K2WPM had brought along his RigExpert AA-170 antenna analyzer. The four antennas constructed on the night showed a consistent SWR of ~ 1.3:1 at 146.565 MHz, with minimum SWR occurring at a frequency of 147.5 MHz. These results were in broad agreement with antenna modeling carried out by NM9J using YagiCAD6 software.

David K2WPM checks performance of Mike W2IGG's foxhunt Yagi while Lovji N2CKD looks on.

Meanwhile, Fred KD2GJJ had brought along his own version of the Yagi, supported on a rifle stock. This approach caused some concern for PCARA's next fox Mike N2EAB! Eleven people had taken part in the FYCAT workshop – including Stan WA2NRV from WECA. Much practical experience was garnered, with many more antennas now available for the PCARA foxhunt on Saturday May 13.

- NM9J

Taconic Road Runners

Jared, KD2HXZ has arranged with the Taconic Road Runners Club (http://www.runner.org/) to provide radio support for their "Mother's Day 5k Race" on Sunday May 14th. This is the day *after* the PCARA Foxhunt. Venue will be FDR State Park in Yorktown, with radio support beginning at 7:00 a.m. — breakfast included.

Check-in for race participants will be from 7:30 a.m. at FDR Parking Lot #1, closest to the Taconic State Parkway entrance. Races begin at 9:00 a.m.

Jared estimates that 4-to-7 members will be needed to cover the 5k (3.1 mile) race efficiently. Requirements include a shadow for the race director, an operator at the start/finish plus each mile stop and a net control at the start/finish. Please contact Jared (cppi475'at'gmail.com) if you can assist.

Peekskill / Cortlandt Amateur Radio Association

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Newsletter contributions are always very welcome!
Archive: http://home.lanline.com/~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 NewYork-Presbyterian/Hudson Valley Hospital, Rt. 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 May 7: PCARA Meeting. New York Presbyterian - Hudson Valley Hospital, 3:00 p.m.
Sat May 13: PCARA Foxhunt, 2:30 p.m. for 3:00 p.m. start from Beach Shopping Center, Peekskill.
Sun May 14: Taconic Road Runners Mother's Day Race. 7:00 a.m. FDR State Park.
Sat June 3: Simplex Challenge.

Hamfests

Sun Apr 30: Orange County ARC Hamfest, Wallkill Community Center, 8 Wes Warren Drive, Middletown, NY. 8:30 a.m. **PCARA Club Table**.
Sat May 20: Southern Berkshire ARC Hamfest, Goshen, CT Fairgrounds, 8:00 a.m.
Sat May 27: Bergen ARA Spring Hamfest. Westwood Regional HS, 701 Ridgewood Road, Township of Washington, NJ. 8:00 a.m.
Sun Jun 4: Mt Beacon ARC Spring Hamfest, Employee Rec Cntr, 83 Red Schoolhouse Rd., Fishkill NY. 8:00 a.m.

VE Test Sessions

May 6, 13, 20, 27: Westchester ARC Radio Barn, 4 Ledgewood Pl, Armonk, NY. 12:00. Pre-reg M. Rapp, (914) 907-6482.
May 11: WECA, Westchester Co Fire Trg Cen, 4 Dana Rd., Valhalla, NY. 7:00 p.m. S. Rothman, (914) 949-1463.
May 15: Columbia Univ ARC, 531 Studebaker Bldg, 622 W 132nd St, New York. 6:30 pm, Alan Crosswell (212) 854-3754.
May 19: Orange County ARC, Munger Cottage 183 Main Street, Cornwall NY. 6:00 PM. Joseph J. DeLorenzo (845) 534-3146.
May 20: Yonkers ARC, Will Library, 1500 Central Ave, Yonkers, NY. 1:00 p.m. Pre-reg John Costa, WB2AUL, 914-969-6548.

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