



PCARA Update



Volume 24, Issue 5 Peekskill/Cortlandt Amateur Radio Association Inc. May 2023

Sprechen Sie Amateurfunk?

So, here's a recap of April's happenings in case you missed some of them. On Saturday April 15, 2023 at 9:00 a.m. another successful PCARA Breakfast was held at Uncle Giuseppe's Marketplace in Yorktown Heights, NY. Jay NE2Q brought along a time-worn amateur radio antenna handbook — the only catch was that it was written in German. *Ich spreche kein Deutsch!* Jay suggested scanning the text into Google and let Google translate it. Gee, Thanks Jay!



A PCARA **Simplex Challenge** was held on Sunday April 16, 2023 at 2:00 p.m. The event was hosted by Uncle Karl N2KZ from the summit of Bear Mountain, overlooking the beautiful Hudson Highlands. A total of 39 stations were worked! A full report can be found in this month's edition of the *Update*. Well done, Karl.

A Laurel VEC Test Session took place on April 26 at Putnam | Northern Westchester BOCES Tech Center. One new Technician was the result. Thanks to Dave KF2BD and the Volunteer Examiners.

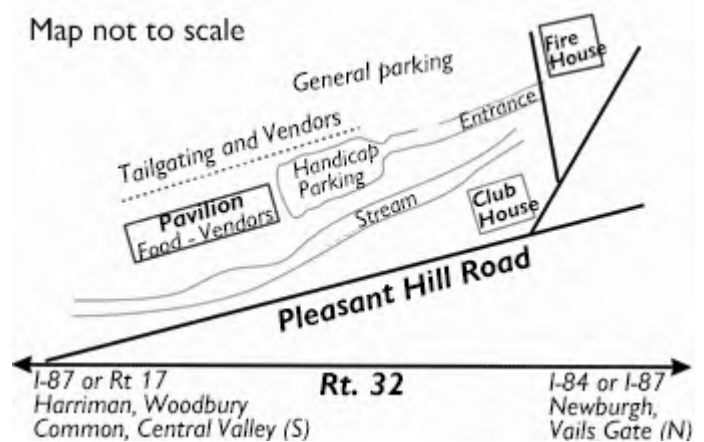
The club is going to try and get together an order for embroidered hats, jackets, and T-shirts and place it with RescueStuff in Peekskill, NY. It is much more convenient for Greg KC2KUA to process orders in bulk (might help in getting a discount). We'll get a price list together and prepare an order. Keep an eye on your email.

Here are some **upcoming events** that you can add to your calendar:

- **Saturday May 6, 2023** at 10:00 am: PCARA **Monthly Membership Meeting** at the Putnam Valley Free Library in Putnam Valley, NY. The meeting will feature a "Question and Answer Session" for new Amateurs. Please invite your friends.

- **Saturday May 6, 2023** at 11:30 am: PCARA **VEE Test Session** — ARRL VEE Test Session at the Putnam Valley Free Library. Candidates must contact Mike W2IG in advance.
- **Sunday May 7, 2023:** Orange County Amateur Radio Club Hamfest at a **NEW** location – Black Rock Fish and Game Club in Mountainville, NY. PCARA has booked an indoor table. Please visit: <https://ocarcny.org/> for details.

Map not to scale



Map shows new location of the Orange County ARC Hamfest on Sunday May 7 — Black Rock Fish & Game Club, 5 Pleasant Hill Road, Mountainville, NY. PCARA has a club table booked in the Pavilion. [After OCARC.]

- **Saturday May 13, 2023** at 9:00 am: PCARA **Breakfast** at Downing Park Pavilion on Crompond Road (Rt. 202) in Yorktown Heights, NY. *Continued on page 2 ⇨*

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- **Saturday May 13, 2023**, at 10:45 a.m.: PCARA **Foxhunt** at FDR State Park on Crompond Road in Yorktown Heights, NY. The role of the *Fox* will be played by Vincent KD2VAV due to the fact he finished first in the last PCARA Foxhunt. This is an excellent time to bring along those tape-measure Yagis that we built at last month's Antenna Workshop.
- **Field Day 2023** is scheduled for June 24 - 25.



Joe WA2MCR has applied to the Lakeland Central School District for permission to return to George Washington Elementary School in Mohegan Lake, NY for Field Day. The permit has now been granted. Thanks Joe!

Once again, our next monthly PCARA **Membership meeting** is scheduled for Saturday May 6, 2023 at 10:00 a.m. at the Putnam Valley Free Library. Bring along anyone wishing to learn more about Amateur Radio. I look forward to seeing each of you there.

Graphic courtesy of Lou KD2ITZ.

- 73 de Greg, KB2CQE

PCARA Board

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Net night

Peekskill/Cortlandt Amateur Radio Association holds a roundtable net on Tuesday evenings at 8:00 p.m. and a directed 'Old Goats' net on Thursday evenings at 8:00 p.m. Both events take place on the 146.67 MHz W2NYW repeater, offset -0.600, PL 156.7 Hz.

Join the roundtable to find out what members have been doing or join the Old Goats with net control Karl N2KZ for news and neighborly information.

PCARA receives grant

Lou, KD2ITZ announced that he has secured for PCARA a generous grant of \$2,500 from the Vivian and M.L. Roy Brand Trust. Thanks to Lou's research, the Trust was able to confirm what had been believed — that Roy Brand had been a licensed ham radio operator. Combing through old Callbooks, Lou found that Roy had been licensed in the late 1950s as KN2MHH.

KN2MHG	WILLIAM H. BEADSLY, 917 BAYSHORE AV, WEST ISLIP	N Y
W2MHH	JOSEPH J. JERANSKY, 426 SECATOGUE AV, FARMINGDALE	N Y
→ KN2MHH	ROY BRAND, 1135 ANDERSON DR, NEW YORK	N Y
W2MHI	GERALD M. O BRIEN, 71 BAYVIEW AV, JERSEY CITY	N J
K2MHI	BARRY J. BALLANCE, 31 THE CRESCENT, MONTCLAIR	N J
W2MHJ	JOHN R. NELSON, 57 MARIE AV, SOMERVILLE	N J

Radio Amateur Call Book, Summer 1958.

Although Roy never upgraded, we are told he continued to enjoy ham radio as an SWL (short wave listener) using his Hallicrafters gear.

Roy Brand (1926 - 2006) moved to Shrub Oak from the Bronx, and was employed with the Lakeland School District in the IT department. He and his sister Vivian were active in many local organizations, including Yorktown Theater, Knights of Pythias and Lakeland Taxpayers. David, K2WPM helped to coordinate the grant; he indicated this might be an annual donation.



Roy Brand.

Adventures in DXing

- N2KZ

Letting Go

How many times have you had this conversation with yourself? “Don’t throw that out! Maybe I can use it one day!” — and — “When was the last time you used that? Throw it out!” Reconsider further and you’ll think: “Someday it will be a part of my greatest project!” Advancing in age, I now know that few of my stored treasures will ever have purpose. Many truly *do* need to find their way into a skip!



Stored treasures or skip-worthy trash?

This behavior is planted within my genes. My entire family are descendants from agrarian sharecroppers who had little or no possessions and grasped onto everything that might possibly have value. I can’t imagine the relief they experienced when they all finally emigrated to the new world! They lived their lives finding value in nearly *everything!* Is this why I have collected gear throughout my life?

Are There Limits?

Collecting can reach wild and great proportions. One of my good friends was gifted with a three-quarter rack holding a complete museum-quality military homing beacon weighing in at 200 pounds! Another good friend also loves military-surplus gear of every shape and size. He has several retired truck containers on his property just stuffed with once very expensive and cherished gear of every size and shape.

Do you want to see a complete old-school radar with a large rotating antenna



1946 YG-1 radio homing beacon produces 25 watts on 246 MHz, feeding Morse Code letter bearings to a rotating antenna.

on its own military green mobile trailer? How about monster surplus carbon-arc spotlights now for hire for parties and circuses? Very entertaining and almost scary all in the same breath!



Military radar trailer.

Remember Me

Now we face further painful dilemmas: Our first instinct does not want to throw anything out or even recycle it. Let’s give it away to someone who will really enjoy owning it — maybe even more than I ever will!

More harsh reality follows! Everything I once appreciated and stored is now obsolete! AM and even FM radios have been superseded by iPhones and smart speakers. Audio cassettes, VHS tapes, CDs and DVDs are all history. Is all the gear



Old technology — Lafayette LT-80B FM tuner and Lafayette LA-218 mono amplifier. [Pics - N2KZ.]

needed to play these archaic media now pointless, too? “It’s all in the cloud, Dad!” Yes, sadly this is quite true! When your treasures become too old, nobody wants it!

Example: Another very good friend recently offered me a beautifully crafted and expensive Morse



Begali Camelback straight key.

code straight key. A work of art, I knew I would never ever use it. It was just not my style and it weighed a ton! I begged to give it back. I then offered it to many friends.

This was followed by the sound of distant crickets! Asking friends to accept legacy gear is often received as an affront more than a kindred gift. What to do?

Inventory and Indecision

Is my decades-old collection worthy, wanting or

wonky? I have not one but three analog push-button car radios from the 1960s. An old HBO microwave needle-nose antenna with built-in down-converter to analog channel 6. Historical books from the late 1800s describing earth science and ancient world history. Almanacs from the 1950s. Useless computer gear, cables and accessories. Discarded broadcast equipment, wall clocks saved from old control rooms, on-air signs, bullet style lamps, old test gear... the list goes on and on.



Old equipment – BC-652 receiver and BC-653 transmitter.

One universal item often found in amateur radio basements: TV tubes! Spice it up with household hardware (often in little glass jars) and parts and pieces perfect for any radio enthusiast circa 1950. Add to this stew more ingredients: My father and his brother (my uncle) were both employed in radio and electronics. I inherited another entire generation of treasured items! Does any of this sound familiar? Oh Lord! Feel my burden!

Your Responsibility

Over 20 years ago, I experienced a series of frightening and humbling heart procedures. One of my very first moves after recovery was to divest of everything I owned that my wife and family could not physically move if I passed away. My handsome and super-heavy military R-390 receiver was at the top of the list. Racks of old broadcast devices, large and heavy coaxial cables and all sorts of gear that others had given me over the years from their personal purges added to the load. My heavy-duty collection was all sold as a lot to a good old friend who is now himself an SK. Ashes to ashes. Dust to dust. You can't take it with you!



R-390 communications receiver covered 0.5 - 32 MHz and weighs 65 lb.

Save It Then Pass It On?

Is this a very natural progression like the eternal passage of time? I find some peace and direction when I recall the Mexican tradition known as *Día de los Muertos* (The Day of the Dead.) The theme of this holiday? Fondly remembering those who preceded us — perhaps in photographs and warm memories of the departed — bringing renewed feelings of faith and contentment. Nothing now remains except what is stored in your soul.

Maybe we need to adapt this kindred spirit to include old equipment we once have known and loved. **Take pictures** before you depart with your gear that has reached end of life. *I remember this wonderful rig yet it no longer taunts my wife and family.* Recalling your past possessions won't clutter your home! Food for thought!

Some Other Strategies

Although amateur radio often encourages surrounding yourself with an endless collection of beloved devices, there are healthy habits that you can learn to adopt and follow. Let me help with your first steps towards new contentment and happiness!

I greatly admire those who keep it current. As you march through life, you always maintain *only* a set amount of devices that are contemporary, up-to-date and appropriate to your operating style. When something new comes along that offers amazing and remarkable new features and oodles of new fun — don't delay! If you can afford it... go get it and enjoy! You only live once!

But wait! Before the unit you just replaced becomes undesirable and irrelevant, **sell it or give it** to someone who actually *would* enjoy it! What is old to you could become new and welcomed by others... before it becomes hopeless junk!

Are you out of ideas when looking for foster homes for your past gear? The annual PCARA equipment auction is a wonderful place to go. Your gear will not only find a new home, the proceeds will also benefit your favorite amateur radio club. If you can't wait that long, PCARA underwrites club tables at major local hamfests. Bring your old gear for sale to the upcoming Orange County ARC Hamfest on Sunday, May 7, 2023 and look for the PCARA table! New homes are found here! Details at: <https://ocarcny.org/hamfest-2/>. Just don't come home with boxes of new junk when you return. Don't do it!

Simple is Good

On occasion, elderly amateurs who have just downsized or have recently been placed in assisted living homes are eager to find something (*anything!*) that will allow them to simply hear the amateur bands. A more grateful recipient you will never find! Bring along

an old HT to donate for their use and you will make a friend for life!

Older hams have their own set of challenges to meet. Some have impaired sight or hearing. Their dexterity may also be lacking. Legacy gear offers them what today's gear can't! Old designs have much fewer controls and buttons. This can be vitally important. Most new designs can be totally disabled by just one errant button press! Old general coverage shortwave receivers offer tuning and volume controls and not much else. This can spell joy for many. Your simple old gear could make someone's day!



Vintage designs with fewer controls like this Heathkit HW-7 can be attractive to older amateurs. [Pics N2KZ]

Organize and Prepare

Someone besides yourself should know what all of your 'stuff' is and does. Two important tips: Label all your gear with tags or descriptions spelling out what this particular object is and does. Sample: "Yaesu FT-dx1200 HF/50 MHz amateur radio transceiver circa 2013." Easy! *Very helpful!* If you are ambitious and creative, include a line or two remembering the story behind each piece. "I used this code key during the centennial celebration of the first transatlantic amateur radio contact." See? Now your old key is *really* worth attention! A good auction or sale should be an *entertaining* event!

Also, create a well-known and obvious place where you keep an organized library of all the manuals and books you have gathered for your major gear. Trying to sell 'interesting' equipment moves much faster if you can also supply a manual and/or accessory supplies. Original boxes can also be quite an incentive for those looking for not only a piece of gear but the entire *ensemble package* that was included at first sale.

Have Mercy

Some credit has to be given to slovenly old souls like myself. If radio wasn't my first love, my focus of lifetime employment and a source of continual joy, would I cherish all of these old objects like they were found gold or jewels? Every piece has a story and a fascinating history... if you have time for me to talk for-

ever on a rainy afternoon. "Listen, down in my basement I even have more stuff!" "Oh no!" you might think! "I bet you do!" Where does your old equipment go when you say 'goodbye?' Have any good ideas? Maybe we can hide it someplace!

All the best to all my fellow collectors! Enjoy the Spring and enjoy life! 73 es dit dit de N2KZ 'The Old Goat.'



YouTube channel

Rob AD2CT reports that the video recording of Mike N2HTT presenting his 3D Printing talk is now available on PCARA's YouTube Channel. The original presentation to

PCARA members took place on a chilly February 24, 2023 with the full title: "Introduction to 3D Printing – A Ham Radio Perspective".



The Peekskill/Cortlandt Amateur Radio Association YouTube Channel can be found at: <https://www.youtube.com/@peekskillcortlandtamateur7670>. At the time of writing there are four video recordings available — with Mike N2HTT's presentation having been viewed 73 times. (How appropriate!) The other presentations are:

- "Pros and Cons of various vertical antennas" - Jay NE2Q
- "Radio Communication Oversights and the sinking of the *Titanic*" – David KD2EVI
- "Practical Horizontal Wire Antennas" – Jay NE2Q

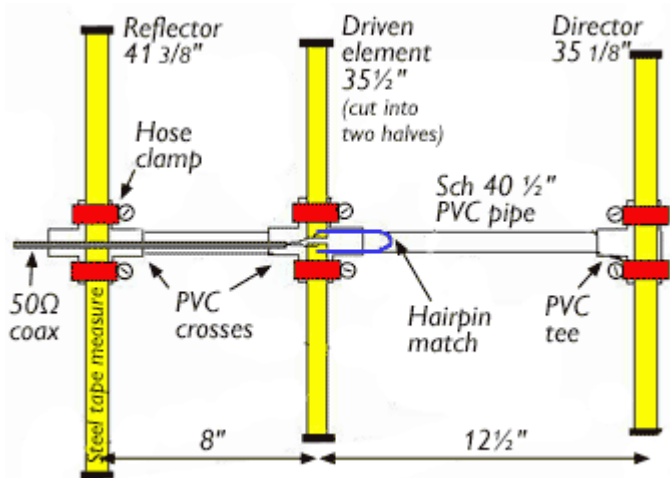


Rob AD2CT with the latest video-editing project open on his computer. [AD2CT pic.]

Antenna Workshop

On Sunday April 2, PCARA members gathered at Putnam Valley Library for the monthly meeting and an **Antenna Workshop**. The aim was to build tape-measure Yagi antennas suitable for the upcoming PCARA foxhunt on Saturday May 13. A previous workshop in April 2017 produced four new antennas.

Verle W2VJ had been taking orders for bulk purchase of items according to the antenna design published by Joe WB2HOL at: http://theleggios.net/wb2hol/projects/rdf/tape_bm.htm. This is a 3-element Yagi, optimized for a clean pattern and good front-to-back ratio. Parts selected by Lou KD2ITZ and Verle included 1/2" inner diameter PVC pipe for the boom, 4-way PVC cross fittings, inexpensive steel tape measure for the elements, hose clamps to attach elements to boom and lengths of 50 ohm RG-174 coaxial cable with male and female SMA connectors.



Tape measure Yagi antenna for the 2 meter band according to the design by Joe WB2HOL.

An assembly line was set up on tables in the Library Community Room. At one table, Lou and Greg KB2CQE were cutting PVC pipe to the specified lengths.



Greg KB2CQE and Lou KD2ITZ cut PVC pipe to the lengths specified by WB2HOL.

At another table David KD2EVI and Verle were snipping steel tape measure to three different lengths — for the reflector, director and two driven elements.



David KD2EVI and Verle W2VJ measure lengths of tape measure while David K2WPM (left) checks the diagram.

At a third table lengths of steel tape were being processed by Jim KD2WSU and grandson Jameson. They wrapped PVC tape around the sharp ends of the steel tape measure to protect against cuts and scratches. Next, they removed paint from one end of each driven element with sandpaper to provide a clean surface for soldering then applied a small amount of solder using a Weller gun.

Other parts that would be soldered together were tinned including cut ends of the coaxial cable and ends of the hairpin match. The hairpin match for this tape measure Yagi design consists of a 5-inch length of solid copper wire formed into a U-shape. See the appendix for a description of how the hairpin match works.

The next step was for each constructor to assemble the parts. Lou discovered that the imported PVC pipe and four-way crosses were an imperfect fit and distance between crosses was a little too long. The solution was to clean the ends of pipe sections with sandpaper, assemble the boom then tap the end of the boom with a hammer until fittings were secure and dimensions were correct.



Size adjustment for the PVC tubing boom.

Tape measure elements could now be secured to the PVC fittings on the boom using hose clamps. Constructors could then solder the hairpin-match inductor and coaxial cable to the two driven elements, being careful not to melt the PVC or the coaxial cable insulation. The final assembly step was to wind six turns of coaxial cable around the boom then secure the cable with tape.



David K2WPM assembles a tape measure Yagi antenna from its component parts.

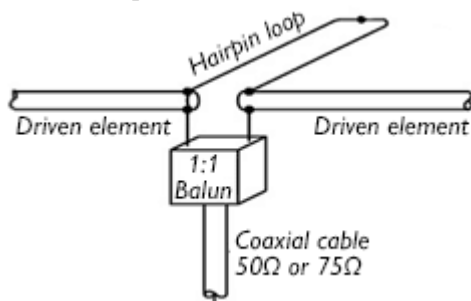
In order to check performance of the completed antennas, your Editor had brought along an FA-VA5 Vector Antenna Analyzer (PCARA Update October 2018 and <https://www.box73.com/>). The four antennas constructed for 2 meters had a consistent performance with minimum SWR of 1.4:1 at 147.0 MHz.

As an additional test, the Bionics transmitter used at the October 2022 Foxhunt was fed into a dummy load so constructors could check directivity of their new antennas inside the Community Room.

Congratulations to Nic KD2SKY, Verle W2VJ, Jim KD2WSU and David K2WPM who successfully built tape measure Yagis for 146 MHz — and to Greg KB2CQE who constructed a 440 MHz version of the antenna. This was according to a design from Hurst Amateur Radio Club, <https://w5hrc.org/media/2020/11/Tape-Measure-Yagi-440.pdf>. (PDF file.) In addition to shortened dimensions, the design makes use of nylon cable ties to secure elements to the boom in place of hose clips. Greg's antenna also had a low SWR in the 440-450 MHz band.

Appendix - Hairpin match

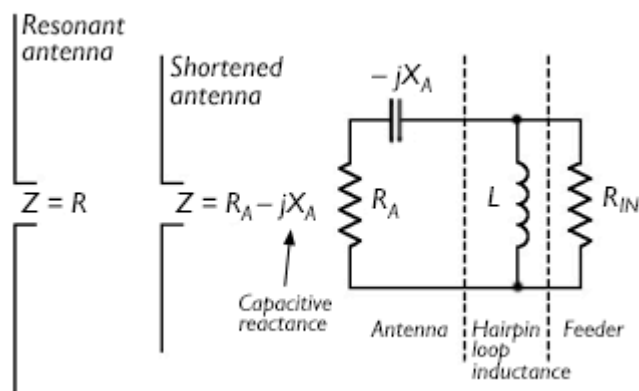
The hairpin match is sometimes used with Yagi antennas to bring the low impedance Z of a center-fed half-wave driven element up to a value of 50 or 75 ohms resistive, suitable for feeding with coaxial cable. The first step is to shorten the driven element so the resistive component of the impedance



Hairpin match for driven element.

now has a capacitive reactance in series, $Z = R_a - jX_a$. The hairpin wire is then attached directly across the central feedpoint of the driven element where it acts as a parallel inductance. Combined with the hidden ca-

pacitance in the shortened driven element the inductor forms a high pass **L network** which matches the resistive component to the higher value of 50 ohms.

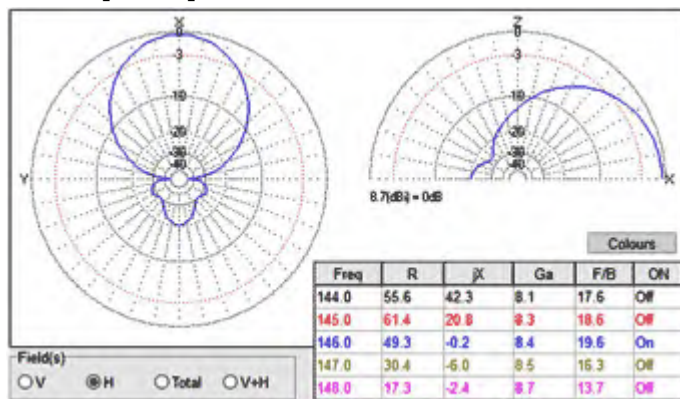


Hairpin match as an impedance matching network. Resonant antenna is shortened to introduce capacitive reactance $-jX_a$. Hairpin loop inductance L combines with capacitive reactance to form an L-network. Low impedance R_a is matched to higher feeder impedance R_{in} . [After W4RNL]

As an example, a three-element Yagi similar to the tape-measure design would normally have a driven element $37\frac{3}{4}$ " long for resonance at 146.565 MHz. The feedpoint impedance calculated by YagiCAD6 is only 18.8 ohms. In order to match this low impedance, the driven element is shortened by around 5% to 35.4". As a result, the feedpoint impedance changes from 18.8 ohms resistive to $15.18 - j42.08$ ohms.

The hairpin match is connected across the feedpoint and appears as a parallel inductance. YagiCAD suggests a hairpin made with 16 gauge copper wire 1.45" long and a spacing of $\frac{3}{4}$ ". Further optimization by adjusting the driven element length slightly can then reduce the VSWR to 1.03:1 at 146.565 MHz.

Similar (though not identical) results were obtained when modeling the entire antenna, including the hairpin loop, in MMANA-GAL.



MMANA-GAL pattern for optimized tape measure Yagi.

References:

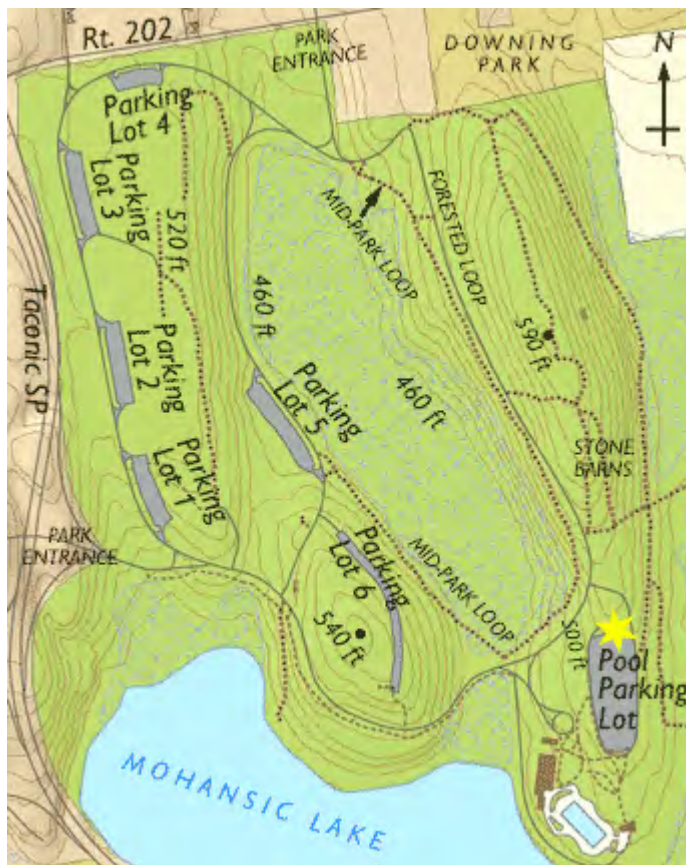
- ARRL Antenna Book, 24th edition p 24.36.
- <https://owenduffy.net/antenna/misc/BetaMatch.htm>
- http://on5au.be/cebik_style/a10/ant28.html

- NM9J

Foxhunt May 13

PCARA's next Foxhunt is scheduled for 10:45 a.m. on Saturday May 13th, following the 9:00 a.m. PCARA breakfast at Downing Park pavilion. The rules will be similar to PCARA's previous Foxhunt in FDR State Park on October 29, 2022. (Report appears in *PCARA Update*, November 2022, p 11.)

"Harry Potter – A Forbidden Forest Experience", which took place in FDR State Park from October 2022 to January 2023 has now been dismantled. As a result, there are no restrictions on areas where the fox might be located and we can return to the Pool Parking Lot for the starting point.



Here are the **Foxhunt rules** courtesy of Lou, KD2ITZ:

- Transmission: FM simplex on 146.565 MHz.
- Transmissions start at 10:45 a.m.
- All are welcome to participate.
- Participants must start in the Pool Parking Lot.
- Participants are not allowed to enter FDR Park before 10:30 a.m. (unless meeting for PCARA breakfast at the usual location).
- Depending on the number of participants, the start times may be staggered.
- Depending on the number of participants, some participants will be invited to start from a different location.

- The transmitter will be hidden within the confines of FDR Park.
- Once the event begins, participants must remain on foot, without assistance of vehicles of any kind.
- Participants are encouraged to work in groups of two or three.
- Participants who locate the transmitter should discreetly inform the event coordinator who will note the time. Avoid revealing the site to other participants who are still hunting.
- The participant who locates the transmitter in the least amount of time will be invited to assume the role of fox at the next event.
- Any changes due to weather or unforeseen circumstances will be posted to the PCARA Google Group and Facebook Page.



Graphic courtesy of Lou KD2ITZ.

ARRL survey

The American Radio Relay League will launch a survey of members on Monday May 1, 2023 in connection with a proposed dues increase. All ARRL members are encouraged to complete the survey questions by visiting <http://www.arrl.org/take-dues-survey>. Taking part in the survey requires each member to be logged-in to the ARRL website.

ARRL members who are not logged-in may select the LOGIN button on top of the web page. If you have not logged in since April 2022, you should use the instructions at: <https://www.arrl.org/login-instructions>.

Member profile: Jay Kolinsky NE2Q - KD2WSU+KD2ITZ

I was first introduced to Jay NE2Q at our Annual Holiday Gathering in December 2022. At the time, Jay was awarded the PCARA *Radio Amateur of the Year* Award for his outstanding service to the club. I had no idea about the depth of the story behind the man known as NE2Q. To say that his story is unique is an understatement. His childhood fascination with electronics and ham radio grew into a highly successful manufacturing and engineering career, and he has been rewarded with a lifetime of radio contacts and friends. Not surprisingly, Jay's story begins simply. It all began with two friends walking home from school, a very simple ham station, and an antenna hidden under a bedroom rug.



Jay NE2Q

Although Jay was born in the Bronx, his parents moved to an apartment building in East Yonkers when he was approximately 11 or 12 years old. Jay explains that he was always a very curious person. At age 4 and to his mother's surprise, he repaired the sparking electric plug on her iron. He would take things apart to see how they worked, pored over Allied Electronic catalogs, and read electronic magazines from cover to cover. His cousins still remember him taking apart their blinking eye dolls and not reassembling them.

The door opens

Jay's ham radio career began one afternoon when Jay was walking home from school with a friend named Steve and trying to teach him a special way to whistle very loudly. Jay explains that as they approached Steve's apartment building, Steve asked, "Hey, do you want to see my ham radio?" As ham radio was unknown to Jay, the first thing he thought of was a ham sandwich on a radio. As you would expect, Jay eagerly replied that he wanted to see this "ham radio". He followed Steve into his apartment. There on the desk sat a Heathkit AT-1, 35 watt transmitter, and a Halli-



Heathkit AT-1 transmitter ran 35 watts input on 80 - 10 meter CW.

crafters S-38 receiver. Although Steve's simple transmitter was only capable of CW transmissions, he demonstrated how the unit worked. That radio emitted lots of odd curious sounds.

Soon Steve, whose call was K2OTT, said he made a contact with a station in Virginia while tapping his Morse key. Jay was amazed! Steve went on to show Jay his unique antenna, which was hidden under the bedroom carpeting! Even today, Jay is astounded by the fact that those radio signals could penetrate the steel and concrete walls of their apartment building and could pick up signals with an antenna that was 8 feet above ground. From this inauspicious start, Jay's entry into ham radio and worldwide electronics manufacturing began.

Early purchases

One of the first things Jay then did was to purchase the 400-500 page ARRL *Handbook*. Bewildered by the myriad of schematic circuit diagrams, he spent years reading and re-reading it until he eventually began to understand the complex material. Around this time, Jay saved up enough money to order an Allied Radio *Ocean Hopper* receiver, with a money order for \$11.95, plus \$2.00 for shipping. After patiently waiting eight weeks for his radio to arrive, he was disappointed to receive a letter from Allied stating that the price had increased by another \$2.00. After a discussion with his father, Jay wrote back



ARRL Radio Amateur's Handbook.



Allied Radio 'Ocean Hopper' regenerative receiver used plug-in coils to cover 0.165 to 35 MHz.

requesting a full refund. As far as Jay was concerned, he had ordered in good faith and would not be taken advantage of. Had Allied Radio known that Jay was just a few years away from launching a highly successful electronics manufacturing firm, we can assume that they would have let the \$2 slide. While using thousands of parts in manufacturing, ironically, despite repeated calls from Allied parts salesmen, Jay never purchased a single component from them!

Novice test

Jay expanded his ham radio world through a family friend, Les K2YZX, that he became acquainted with at his parents' summer home in Mohegan Lake. Jay passed his Novice test administered by Les in 1958. The exam included successfully receiving Morse code at 5 words per minute. He was issued the call WV2BLX. Jay built a Heathkit AR-3 receiver and DX-35 transmitter, which he still owns. Although frequency stability of

the AR-3 was a significant challenge, it was on this receiver that Jay made his first ham radio contact with a station in Pennsylvania. Three months later, he passed the General test, receiving 13 words per minute at the FCC building in NYC.



Heathkit AR-3 four-band superhet receiver for 0.55 - 30 MHz.

Business beckons

At the ripe old age of 19, Jay went into the electronics manufacturing business in part due to his ham radio experience. A friend of his, Sam, had created a homemade noise limiter circuit, which reduced man-made noise on Sam's own receiver. Although his friend strongly disagreed, Jay felt that the limiters could be sold commercially. He started Kolin Engineering Company and began to build and market the Kolin NL-1 noise limiters from his bedroom. These units were initially sold through QST magazine advertisements starting in 1962.

The price was \$5.95.

Out of necessity, he began to learn the mail order business, product assembly, banking, advertising, and customer relations. Eventually he was able to convince Lafayette Electronics, a precursor to Radio Shack, to sell his limiters in their 40 stores and catalogs. Kolin Engineering Company was slowly building momentum.

NOISE BOTHERING YOU?

USE THE KOLIN NL-1 TO EFFECTIVELY CUT OUT IMPULSE NOISE IN YOUR AM RECEIVER

- Effective circuit uses low leakage silicon computer diode instead of tube
- Self adjusting series gain noise limiter
- Requires no power. Works regardless of supply voltage — 6, 12 or 15V ac/dc
- Miniature circuit enables easy mounting inside your home or mobile receiver
- Works on tube or hybrid receivers
- Only 3 connections to your receiver
- Mounting hardware and switch supplied
- Improve your reception for the low price of \$5.95

Send \$5.95 to
Kolin ENGINEERING COMPANY
 Box 357 Bronxville, N. Y.

Coming soon — NL-2 for all transistor receivers

Advertisement from QST, Nov. 1962.

Kolin SOLID STATE SUBMINIATURE NOISE LIMITERS

MODEL NL-1 MODEL NLT

7⁹⁵ **14⁹⁵**

- For All Tube and Hybrid Receivers Employing A Diode Detector
- For Solid State Transceivers and Receivers with 455KC or lower IFs

The Kolin solid state noise limiter is an extremely effective self-adjusting device which suppresses impulse noise in AM receivers. Small enough to mount directly inside most receivers, it will work on supply voltages of 6 to 220 volts AC or DC. Only 3 connections are required. A switch is provided to disable unit in normal quiet areas. Works on all tube and Hybrid receivers employing a diode detector. All necessary instructions and mounting hardware are supplied. Size: 1 1/2 x 1 1/2 x 1/4". Shpg. wt., 8 oz. 42 H 4510 Net 7.95

The Kolin NLT solid state noise limiter combines effective impulse noise suppression with an increase in overall receiver gain for improved readability of weak AM signals. Especially designed for use in today's solid state transceivers and receivers. When switched into operation, weak signals will seem to "pop" out, and the noise will be reduced to a hiss. Operates on supply voltages of 9 to 15 VDC. Complete with installation instructions. Size: 2 1/4 x 1 1/2 x 3/4". 42 H 4511 Shpg. wt., 8 oz. Net 14.95

Lafayette Radio Electronics catalog #680, 1968, p 170.

A second-generation transistorized noise limiter for solid state receivers was designed, and Jay expanded his inventory to include CB microphone amplifiers, which coincided with the CB craze of the 1970's. All of Jay's electronic work took place at night and on the weekends while he worked his "real job" selling outdoor furniture on the wholesale market.

Kolin SOLID SOUND MICROPHONE AMPLIFIER

\$14.95 less battery

MORE AUDIO
 UP to 16.5db voltage gain!
 Substantially increases "TALK POWER"

CB microphone amplifier advert, S9 Magazine, Sept 1964.

Alarming developments

In 1969 one of Jay's most significant brainstorms came following the theft of his beloved 1965 white Pontiac convertible during a party in Manhattan. Following the disheartening event, Jay concluded that he would install an alarm in his next car to deter thieves. Although his car was eventually recovered, he used the approximately \$1,200 insurance check to create a car alarm business. He then incorporated under Kolin Industries Inc. This now became a full-time job. Jay was on the brink of a significant manufacturing event.

At the time, car alarms and sirens were comprised of a simple relay, switches, and a motorized mechanical siren that typically drew 40 amps from the car battery. Those systems had no auto shut-off timers and when triggered, car owners were usually confronted with a dead battery. Seeking unique sirens for his alarms, Jay knew of a company called Federal Sign and Signal in Blue Island, Illinois that had recently created an electronic siren for police cars. It used a complex audio amplifier circuit with many parts. This type of siren was much more reliable and attention getting than the traditional motor driven sirens of the time. Jay turned back to his friend Sam, who had created the noise limiter, and asked him to create a similar sounding electronic siren using a power oscillator circuit. Sam had a degree in electrical engineering. The sirens that resulted were not only more powerful but were also more cost effective as they had just 5% of the components of the electronic siren circuits used in emergency vehicles. The whoop-whoop sound was unique and appealing to the consumer while frightening thieves.



Federal Signal Corp. 'Interceptor' electronic siren.

The reality that followed is somewhat mind bog-

gling. Jay soon became the first person in the world to successfully market an electronic siren car alarm that did not need switches in all the doors, hood and trunk. A unique new circuit monitoring the car's battery voltage would trigger the siren when any courtesy light bulb or trunk light would come on. Installation time was cut by 80% compared to the older motor driven siren auto alarms that needed switches and wiring to every door, trunk and hood. Jay's car alarms had automatic 10-minute shut-off timers. When triggered they would only draw 3/4 of an amp, 1/50th of the old-fashioned electric motor sirens. No more dead batteries!



Prototype two-piece 'Junior EarSplitter' theft protection alarm as shown at 1971 International Security Conference, Chicago IL. [NE2Q pic.]

Immediately, demand was incredible.

Realizing that his product would soon be copied, Jay unsuccessfully sought to patent his power oscillator siren circuit. That cost him over \$5,000 (\$50,000 in today's dollars.) Spurred on by his lack of protection, Jay realized that overseas markets with cheap labor would soon be undercutting him with low priced copies of his designs. Jay's surprising solution to this dilemma was to beat the competition to the punch by traveling to Japan and setting up his own factories. Beginning in Japan, and then expanding into Taiwan, Jay copied his own products and had them produced in these cheap labor countries. He offered a variety of sizes and prices.



Jay (center) and his father Ben (left) at a 1972 London Trade Show with full range of 'EarSplitter' alarms. [NE2Q pic.]



Early siren production in the basement of Jay's father's home in Lake Mohegan, 1970. Electronic circuitry was potted in epoxy behind the speaker horn. [NE2Q pic.]

He marketed three lines of products. USA, Japan, and Taiwan with a full range of pricing from high to "basement" low. Nobody dared to compete. There were



'Big Stop' vehicle immobilizer automatically interrupted ignition circuit. Installation could save up to 15% on insurance. [NE2Q pic.]

always corporate customers, such as Westinghouse, that demanded USA-made quality. For customers interested in the lowest prices, East Asian production filled the demand. For 14 years, Jay had no competition in the alarm market. It is hard for most of us to fully comprehend the business success that ensued. It is

worth noting that five of his original electronic sirens are now on display at the Smithsonian Museum in Washington D.C.

Jay attributes much of his business success to the fact that work seemed more like a hobby than an actual job. It was mostly all fun for him. As he traveled the world to visit his customers, he continued to expand his network of radio contacts, occasionally meeting his many contacts in person. Not yet fully satisfied with his alarm business, Jay found



Jay was invited by the Queens NY District Attorney to speak on auto theft in ~1980. [NE2Q pic.]

another ingenious way to expand his electronic footprint in 1980.

Nuclear protection

Following the Three Mile Island disaster in 1980, FEMA and the federal government required that all nuclear reactors must have emergency sirens within a 10-mile radius. Jay proposed a complete siren system of his own design for the Indian Point nuclear plant in New York to satisfy the mandate. It was accepted over his main competitor Federal Sign and Signal, a publicly traded corporation, and soon led to a multimillion-dollar deal with all four New York State nuclear plants. After not getting even a penny from any sales in NY State, the president of Federal Sign & Signal offered Jay a job. Jay turned it down.



Request for proposals from Power Authority of the State of New York for alert and notification system in 1981. [NE2Q pic.]

Pounding it home

In 1980, using some of the capital from his business success, Jay and his wife Ulla purchased 7 acres at the highest point in Pound Ridge for a new home. Despite having no experience in construction, Jay was the general contractor. It is here that Jay eventually designed his dream home and radio shack. Jay's transceiver of choice is now an Icom IC-7300, which is combined with a homemade legal limit 8877 tube amplifier. His current antenna array includes:

- A five-element Yagi for 20 meters on a 42' boom.
- A Yagi for 10 and 6 meters on a 9' boom.
- A ¼ wave sloping wire for 80 meters.
- A four-element directional wire array for 40 meters aimed at Europe.
- A 70 ft. high, center-fed vertical dipole that works on seven bands.

All Jay's antennas are designed and constructed by him. He has made hundreds of contacts on all seven continents and has met many of these hams face-to-face during his worldwide travels. Jay explains, "when you meet someone that you've spoken to over the radio waves, it's like you're meeting an old friend." In most cases he was treated like royalty.

Jay prefers the 20m band, especially at night with 40m as a backup. He talks to a friend, Moz VK3CWB, in Australia almost every day. He prefers the long path for

this exchange, which is over 14,400 miles. Incidentally, he still maintains occasional email contact with Steve, who is now retired from a successful career as a psychiatrist in California.



Steve, Jay's original inspiration.

Jay's most unique ham radio experience occurred during Desert Storm in 1990. Operating on the 20 meter band, he was contacted by a W8 station signing mobile in Iraq. It was a US tank commander calling as his battalion was rolling across the border. At the time, news that US forces were moving into Iraq was not yet public. The tank commander asked Jay to help him connect with his ham father whom he had not spoken to in 2 months. Jay successfully connected the father and son and enabled their conversation. All because of ham radio!

Jay has been involved With PCARA for approximately six years. In December, he was recognized as the PCARA Radio Amateur of the Year for his generous support of the club. At the September PCARA meeting, he gave a comprehensive presentation on vertical antennas and common mode currents. Jay is an expert in antenna design and computer antenna modeling, and has helped numerous club members improve their stations. Although he was out of the country in June of 2022, PCARA enjoyed great success on Field Day using a 3 element 40m wire beam that Jay had designed.

Jay feels that the greatest thing about ham radio is the ability to meet people from all walks of life all over the world. His advice for new hams is to not purchase a walkie talkie VHF handheld unit, but rather pursue HF radio. Unlike many of today's operators who make contacts lasting just a few seconds, Jay is a firm believer in actual long duration conversations over the radio waves. "You can't make a friend in 15 seconds," he says. In fact, he authored an article in QST entitled, "How Many Friends Did You Make?" (QST October 2012). He feels his greatest achievement in life is what was created from that simple introduction to ham radio as an 11-year-old.



Clearly Jay's involvement with ham radio has led to a lifetime of personal and professional success and enjoyment. One can only hope that all of us gain fulfillment and satisfaction from our own ham radio hobby. 73 to all!

-73 de Jim KD2WSU with Lou KD2ITZ

Simplex Challenge – N2KZ

Did you ever get caught in a summer's downpour? There were subtle hints of things to come. An oncoming storm was certainly in the air. Then, with little warning, the skies just opened and torrents of rain soaked you to distraction. Surprise! An unforgettable moment! You march on and eventually find shelter nonetheless. You feel like you were just plunged into an ocean, but you shake it off with a good laugh and a smile!

Our recent PCARA Simplex Challenge was nary different. The early morning brought us thick fog. I had to call the Bear Mountain NYS Park Police to verify that Perkins Drive would indeed be opened by afternoon. The mist and murk finally burned off by the time I arrived atop Perkins Drive at about 12:30 p.m. Sunday. Upon arrival, I spoke to quite a few people on 2 meters just using my trusty handheld Yaesu FT-60 HT for about 90 minutes before the official event start. Come 2:00 p.m. on Sunday, April 16th the PCARA Simplex Challenge began and our mobile Icom transceiver was flooded with calls clamoring for our attention. We scribbled onto our notepad logs for over an hour touching base with a total of 39 stations! Wow! Thank you, everyone!

Picture our locale and surroundings: Malcolm NM9J and I sat in his SUV at the top of Bear Mountain. His compact Icom IC-207H was powered by a Bioenno lithium iron phosphate (LiFePO₄) brick-style battery in his back seat. A nifty Comet SBB-7 extended mobile whip antenna sent our signals out to the world from the car roof.



Simplex Challenge vehicles parked on Bear Mountain. Karl N2KZ is pointing out the Comet SBB-7 antenna.

At just 10 watts output, we gained first-hand experience on how to handle a true ham radio pile-up! This was only half of the show! The Challenge participants could not see what was going on surrounding our mountaintop mobile base station. Our favorite perch at the summit, the picnic area loop road northwest of the Perkins Memorial summit observation tower, had just

been beautifully resurfaced. It was cordoned off to new traffic. Oh no! Where should we go?

We compromised by finding a couple of adjoining parking spots in the larger road loop around the base of the tower. It was a circus on its own! Continual traffic shuffled in and out peppered with the sound of loud mufflers and sound systems getting down. Picture the entrance to a summer carnival!

Malcolm even entertained in-person visitors to our station atop the mountain: “Bear in mind there was a period when I was *not* taking notes after I stepped out to see Howard AB2YZ and Bert KE2ATK pay their visit. (Bert had upgraded to General at our VE Test Session on March 29th – Howard is ex-Peekskill and Bert’s Elmer.)” Our tourists took pictures of us while in action. I just wish we had a better chance to spend some time to greet them and say ‘hello’!



Howard AB2YZ and Bert KE2ATK came by with their Baofengs.

Meanwhile... Dozens of slick-looking BMWs arrived around us along with a sea of roaring BMW motorcyclists convening for some sort of early Spring convention. Dozens of young families with joyful children continually passed by. It became a casual car show! A sleek dark blue Tesla Model 3 pulled into a spot nearby. Later, an elegant brand new midnight black Polestar sedan parked right next to our SUV. Very, very impressive! Even a bright orange McLaren came by. See? Sorry you couldn't enjoy the crazy chorus around us!



A long line of BMWs was circling Perkins Memorial Tower, on top of Bear Mountain.



View from Perkins Memorial Tower across Peekskill Bay.

The radio reception atop Bear Mountain was equally mesmerizing. At 1289 feet above sea level using a fine quality transceiver, and a 4.5 dB gain antenna to keep our beam focused low to the outreaches of the horizon, we were ready and able to hear the world. Fear not! We instantly became quite the center of attention. We also often noticed how tropospheric propagation and aircraft flutter could affect our deep reaches into DX territory. Some stations required several pleas to complete our log entries. "I'm missing your prefix! Is that *November 2*?" We danced with the deep VHF fades until we pulled everyone through. For the record, our Bear Mountain site was within Maidenhead grid **FN21xh**.



Karl N2KZ deals with the 'pile-up' on 146.565 MHz

The very first minutes of the Challenge were just chaotic! Our plan was to proceed just like any regular ham radio chat net you might hear every day. We began with a quick check-in via the very local PCARA repeater on 146.670 MHz and then quickly went QSY to a *usually* abandoned simplex frequency of 146.565 MHz. No way would we invade and abuse the 2 meter National Simplex Calling Frequency 146.520 MHz with our event.

Previously, 146.565 MHz had always served as a silent and tranquil oasis for our low power foxhunt transmissions and not much else. Early on, someone sent us a shout-out: "Hey! Didn't you know '565 is a very busy frequency?" We had to laugh! Well... it cer-

tainly was now! What a monster of RF had been released. Let's hop aboard and take a ride!

Our weeks of event publicity paid off. We attracted massive attention and it was great fun! Our notepads became filled with stations scattered within a 50 mile radius and maybe even further! By the time we reached 3:00 p.m., 39 stations had been logged in. Most every station managed to reach us again when we tested our luck with a QRP round. A couple of stations asked us, quite precisely, what we meant by QRP (low power.) "How much power? What kind of an antenna? Using a Baofeng? What should we do?" Our curt reply: "Just less power than you *were* using!" We needed that good laugh. Malcolm and I had a great time. We just hoped that everyone else did too!

Using QRP was remarkable and revelatory. Many people were amazed at the performance of their gear. "OK. I am at ten watts. You can still hear me? OK now at 5 watts? You can *still* hear me? OK, OK, Now I am at one watt! *Really?* You can still hear me?" Yes! No doubt, incredible height can be a very powerful advantage on VHF. A lesson well learned! Every station was asked to come back to us at their lowest output powers they could provide. We heard almost every single station that tried! Being up on top of a mountain really is a spectacular and amazing experience. You should try it sometime! The Simplex Challenge came to an end at 3:20 p.m. I was relieved to stop talking and rest. What a marathon!

A note for future visitors to the Perkins Memorial Tower: don't forget your HT and climb up the seafoam green stairs to the very top to the final observation deck. The additional height above ground will result in a big signal reception boost. Keep your antenna perfectly vertical and against a window. The signals you will hear will be profound!

Unfortunately, this is a fairly unfriendly place to hold even a very short QSO. The available space up there is narrow and extremely limited. The tower's



Perkins Memorial Tower was near the Challenge vehicles.

acoustics produce cave echoes and you will hear every little noise, conversation and glee-filled bursts of joy inside the entire tower space all at once with amplification. It is still worth a try. Experience it — even for just a few moments!

Thank You!

As hosts of the Simplex Challenge, we were truly humbled by the efforts of each and every participant. Our fellow amateurs invested time, considered planning and gathered necessary supplies to join our adventure. Many drove and/or hiked and climbed to mountaintops to reach us. As we called everyone who checked in on our list, we heard great stories and fascinating background information all about the locations they picked for this afternoon and why they enjoyed being there.

Several amateurs sent pictures of their hilltop stations. Tom, N2AXX mailed us a terrific analytical map showing the path between his site in Ramsey, New Jersey and our host station atop Bear Mountain. Fancy stuff!



Google Earth map and cross-section from Tom N2AXX, in Ramsey NJ, FN21wb.

David, K2WPM provided a handful of pictures of the view from the top of the Ninham Mountain fire tower. That tape measure Yagi looked great!



David K2WPM points his new tape-measure Yagi antenna from Mt. Ninham fire tower. [K2WPM pic.]

I could only wonder what your results would be if you brought ‘serious’ equipment up Bear Mountain. Imagine an 80 or 100 watt FM transceiver and a long Yagi (or a stacked Yagi array) up there. I am sure it would be remarkable! I once worked the ARRL VHF/UHF contest from the west side lookout



Jared KD2HXZ operated his Go-Box Mk II from Mercy College parking lot, close to the intersection of the Taconic State Parkway and Rt. 202. [KD2HXZ pic.]

just below the Perkins Memorial Tower. Using a 6 meter mobile QRP rig and a very simple mag-mount antenna, I worked Maine and Rhode Island. Not bad!

After the event, Malcolm and I traveled down to



Map shows location of many of the stations worked from Bear Mountain during the Simplex Challenge. Not shown as they are off the map are KD2LE (South Glen Falls NY) and KB2VSW (Smithtown LI NY).

the Westchester Diner across the river in Peekskill, NY and met some of our friends who participated in the Challenge: Joe WA2MCR, David KD2EVI and Nic KD2SKY. It was the perfect end of a perfect day!

Please let me extend the heartiest thanks to all who joined us this Sunday afternoon. What a memorable and grand day it was. Your amazing efforts made it all happen. It was a pleasure to captain this ship!

Here Comes the Fox

Speaking of 146.565 MHz, don't forget our next adventure on this frequency! The PCARA Foxhunt event returns on Saturday, May 6th, 2023 at FDR Park right after our monthly club breakfast at Downing Park Pavilion starting at 9:00 a.m. After all... it's *CQ Magazine's* Foxhunt Weekend. This is a listen-only event. No amateur radio license is required. Bring your handheld transceiver, bring a friend, and maybe a tape-measure Yagi and... your enthusiasm and we will bring you good times and great smiles. Guaranteed!

– 73 from Karl N2KZ on 2 meter simplex and listening!

V.E. Test Sessions

March 29

PCARA's second V.E. Test Session of March took place on Wednesday March 29 at Putnam | Northern Westchester BOCES Tech Center. Four candidates arrived to take amateur radio examinations under the auspices of ARRL VEC.

PCARA member Ivan Ward of Verplanck passed FCC Element 2 and qualified for Technician. FCC granted his new Technician license with call sign **KE2BCT** on April 7, 2023.

PCARA member James Gardiner KD2WSU of Mahopac passed Element 3 and upgraded from Technician to General. Well done, Ivan and Jim!

Bertram Rechtschaffer KE2ATK of Garrison, NY



Ivan (now KE2BCT) and Jim KD2WSU with their CSECs from the March 29 V.E. Test Session at BOCES.

also upgraded from Technician to General. Bert's Elmer, Howard AB2YZ (previously of Peekskill and now of Hawley, PA) was present to join in the congratulations.

Thomas Donovan KD2UPB of Verbank, NY passed the 50-question Element 4 test and upgraded from General to Extra.

PCARA's Volunteer Examiners included Team Liaison Mike W2IG, Lou KD2ITZ, Dave KF2BD, Rob AD2CT and NM9J.

April 26

PCARA scheduled a further V.E. Test Session for 7:00 p.m. on Wednesday April 26 at Putnam | Northern Westchester BOCES Tech Center. This was a Laurel VEC Test Session, with candidates asked to pre-register with Dave KF2BD. There was one candidate — Robert Rand of White Plains, who successfully passed Element 2 and qualified for Technician. Robert was granted the new call sign KE2BFT by FCC on April 28.

The Volunteer Examiners included Team Leader Dave KF2BD, Lou KD2ITZ, Rob AD2CT plus NM9J.

Next session — May 6

PCARA's next V.E. Test Session is scheduled for Saturday May 6, 11:30 a.m. at Putnam Valley Library. This will follow after the May monthly meeting with Q&A Session on "Ham Radio – How to get started".

The May 6 Test Session will be held under the auspices of ARRL VEC. Candidates must contact Team Liaison Mike W2IG using w2igg@at@yahoo.com.

**Test Session for
FCC Amateur
Radio License**

**Saturday
May 6th
11:30am**

**Free Study Guide
Available**

Get your amateur radio license and discover...
Camaraderie – Community Service
Emergency Preparedness – Fun
Science – Technology

ARRL Volunteer Examiners: \$15 Test Fee
Discounts available to candidates under 18
Candidates must RSVP: w2igg@yahoo.com

Putnam Valley
LIBRARY

PCARA
Peekskill/Cortlandt
Amateur Radio
Association

Graphic courtesy of Lou KD2ITZ.

Mobile power

Many moons ago, I had a mobile installation with U.K. vacuum tube radios such as the Pye Ranger and Marconi B44. These all-hollow-state transceivers ran off the vehicle's

12 volt battery using a vibrator power supply to generate high voltages. The Pye Ranger PTC2001/2 had eleven tubes in its receiver and eight more tubes in the transmitter.



Pye Ranger mobile transceiver had a total of 19 vacuum tubes.

Power draw on receive with transmit heaters switched on was 58 watts (4½ amps at 12V DC), while on transmit this increased to 105 watts (8½ amps at 12V DC). Efficiency was not great — for those 105 watts consumed, only 5 watts of amplitude modulated RF output power was produced.

Available energy had to be carefully conserved. If your car engine was switched off to save fuel, how long could you operate the radio before the battery was drained? Nobody wants to be stranded at an isolated location with no way to start the engine. Hand cranks ('starting handles' in the U.K.) were disappearing from vehicles. Savvy operators would park on a hill facing downward so they could start the engine by coasting downhill then engaging the clutch on the four-speed gearbox.

This was the age of the flooded cell battery with removable caps to check the level of battery acid. Motorists would keep a bottle of distilled water to top-up the electrolyte plus a hydrometer to check the specific gravity — and hence the strength of electrolyte in each cell. Once the car had picked up enough speed, the battery was charged by a DC-generator and control box. (This is in contrast with today's alternator, which can charge the battery at idling speed.)

Radio progress

Technology moves on... mobile receivers advanced from vacuum tubes to solid state, vibrator power supplies were replaced by transistorized inverters and before long the entire transceiver was using silicon transistors that ran directly off the +12V negative ground supply. The next step was when individual quartz crystals for each channel were replaced by a frequency synthesizer that could cover the entire band. Amateur Ra-

dio abandoned amplitude modulation, moving to FM and higher power output for VHF mobile work.

These developments had an effect on the 12V DC power consumption by amateur radio transceivers. Take a look at the following table with examples of current draw in amperes for transceivers that have figured in my own station over the years.

Transceiver	Standby current	Low power TX	Full Power TX
Pye Ranger	4.5A		8.2A (5W)
Pye Cambridge	1.5A		5.0A (7W)
Pye Westminster	0.2A		2.5A (15W)
Icom IC-22A	0.18A	1.2A (1W)	2.1A (10W)
FDK Multi-700EX	1.0A	1.8A (1W)	5.7A (25W)
Icom IC-3200A	0.5A	3.5A (5W)	7.5A (25W)
Icom IC-2710H	1.2A	4.5A (5W)	12.0A (50W)
Icom IC-207H	0.8A	4.5A (5W)	12.0A (50W)
Icom IC-2730A	1.2A	3.5A (5W)	13.0A (50W)

I remember the Icom IC-22A from the 1970s with a certain amount of fondness — it had the lowest standby current and lowest current consumption at its full output power of 10 watts. There was little danger of draining the car battery with that radio.



Icom IC-22A was an all solid-state 2 meter FM transceiver with 22 crystal-controlled channels.

Everything went downhill from there — the frequency synthesizer in subsequent radios raised the standby current to around 1A. Power outputs increased to 25 then 50 watts, raising the full-power current draw to 12 -to-13 amps... even more if you had a high power mobile transceiver such as the Yaesu FT-2980R which draws 15 amps for 80 watts RF output. When transmitting on the low power setting, efficiency of these modern radios is still a concern. Drawing 4.5 amps for 5 watts RF output suggests an efficiency around 9%, not much better than those old vacuum tube transmitters.

How long?

If you need to run full power output from a static mobile station for any length of time, one solution is to keep the vehicle engine running. This should ensure the battery is kept charged — but it is a waste of fuel, produces exhaust pollution and engine idling is banned in some locations.

If you switch the engine off, how long can you expect to run a modern transceiver without draining the

battery? First check the battery specification. My own vehicle has a “Group Size 51R” battery rated “500 CCA” and “85RC” — properties that are defined by the Battery Council International. Group Size refers to physical size and terminal arrangement. “CCA” stands for **cold cranking amps**, and is defined as the

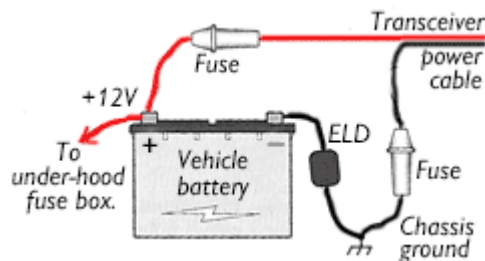


Battery identification label.

current a battery can provide at 0°F for 30 seconds while maintaining a voltage of at least 7.2 volts (1.2V per cell). *Consumer Reports* suggests — don’t focus too much on cold-cranking-amps as modern cars with computer-controlled, fuel-injected engines take no more than a few seconds to start.

“RC” stands for **reserve capacity**, defined as the time in minutes that a lead-acid battery at 80°F will continuously deliver 25 amperes before its voltage drops below 10.5 volts. In my case, 85RC means the battery should provide 25A for **85 minutes**. This suggests an ampere-hour rating of $25 \times 85/60 = 35\text{Ah}$. This ampere-hour value is at the specified 25A discharge rate — if you were to discharge at a lower current, say 1 amp, you might find the ampere-hour rating increased, perhaps to 45 or 50Ah.

Let’s suppose we have a fully-charged, brand new car battery, with the transceiver connected directly to the battery according to recommendations of Alan KØBG in “The Modern Mobile”, *QST* May 2015, p 35. (Alan recommends connecting to battery and chassis ground so the vehicle’s Electronic Load Detector (ELD) is **not** bypassed.)



Connection of transceiver’s fused power cable to battery positive terminal and chassis ground so that electronic load detector (ELD) is not bypassed. [After KØBG].

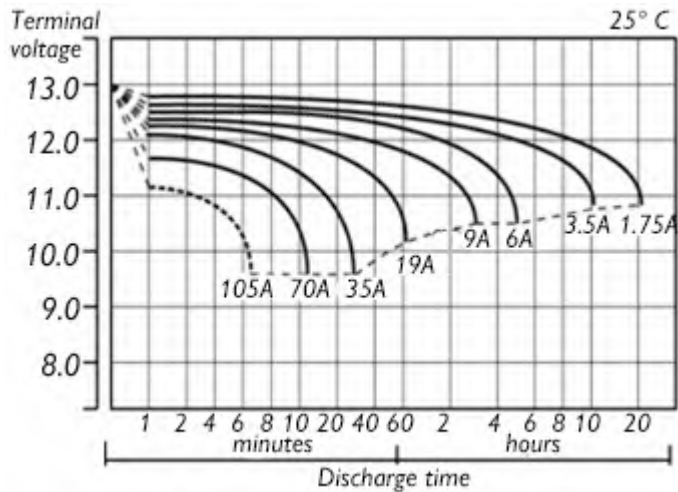
If we transmit 50% of the time at high power, drawing 12 amps — then receive for 50% of the time drawing 1 amp — the average current over time is 6.5 amps. Our 35 ampere-hour battery *might* be able to keep this up for 5 hours.

Battery butts

There are several “butts” concerning this 5 hour estimate. If we drain the 12 volt battery voltage down to 10.5 volts, the transceiver might not be able to operate

any longer. My Icom transceiver specifies a supply voltage of **13.8V DC ± 15%** meaning a range of 11.7V to 15.9V. If you have to stop operating when the battery reaches 11.7V, only 50% of the rated capacity has been used — so perhaps only 2.5 hours of radio use.

We also need to retain sufficient battery voltage (and capacity) to reliably start the engine at the end of our operating session. So to be safe, let’s stop operating when we reach 12.0V, perhaps after 1.8 hours.



Curves show terminal voltage against time for a 12V 35Ah sealed lead acid battery with different discharge rates.

Suppose the car battery is *not* new and has been subject to high temperature driving with loss of water from the electrolyte. It might only have 66% of its rated capacity. Perhaps we should stop after 1 hour?

One thing we should certainly do is monitor battery voltage during radio operation. Voltage meters using Anderson Powerpole® connectors or a cigarette-lighter plug are available from vendors such as Quicksilver Radio and Powerwerx.

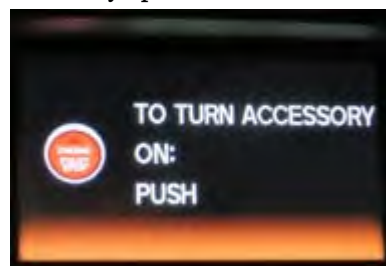


Inline meter with Powerpoles displays voltage and current.

Accessory to a drain

In the previous example, we assumed the engine was off, the transceiver was connected directly to the car battery and nothing else was drawing current.

But what happens if the vehicle ignition switch is turned to the “ACC” or “Accessory” position? In an older vehicle, this simply activated the car radio and perhaps a few other accessories such as power windows. In a modern vehicle “Accessory Mode” may turn on the vehicle en-



ertainment system, satellite radio, GPS, Bluetooth phone connectivity plus USB and cigarette lighter outlets. It may even turn on a fan to cool the display and electronics behind the dashboard. The total current draw could be as high as 5 to 10 amps — even more if you leave external lights on. This is a sure way to drain the vehicle battery to a point where it cannot start the engine. Another cause for concern is use of a cigarette lighter outlet to power the radio. The outlet will probably have a maximum current rating of 10-15A and voltage drop caused by light-gauge wiring can be excessive. Beware!

Auxiliary battery

If you need to run a mobile transceiver for a lengthy period *without* exhausting the vehicle battery, then you could add an **auxiliary battery**. This second battery would still be charged by the vehicle alternator while the engine is running, but would only power the radio equipment, leaving the vehicle battery to start the engine.

A second battery would need to be reliably secured to the vehicle with wiring sized to carry the charging and radio current. Isolation could be arranged by using a simple blocking diode as shown in this diagram from RSGB's 1968 *Radio Communication Handbook*. (At the time, many vehicles were still positive ground, or 'positive earth' in British English.)

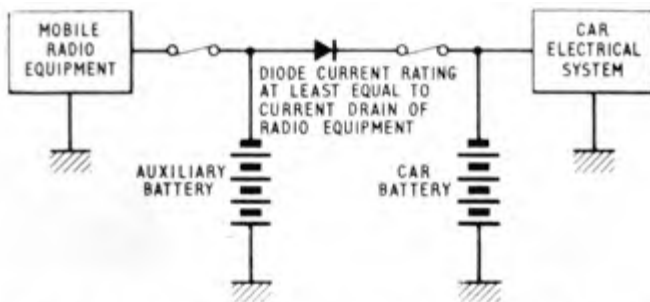


Fig. 16.26 Diagram showing how auxiliary battery can be added to the charging system of a car using positive earth. For negative earth systems, polarity of diode should be reversed.

1968 diagram shows how to use a semiconductor diode to isolate an auxiliary battery for radio equipment from the main car battery.

A more modern approach would be to substitute the diode with an Auxiliary Battery Isolator such as West Mountain Radio's ISOPwr+. This device uses an FET switch capable of handling 40 amperes.



Portable power station

Another approach to extended operation from a vehicle would be to transfer the radio's power supply away from the vehicle battery and run it from a separate

source of 12 volts DC. This is relatively easy if the radio power cord has been equipped with Anderson Powerpole® connectors.

The alternative source might be a "Portable Power Station" containing a 12 volt battery, intended for jump-starting a vehicle, inflating tires or providing power for small devices. I have a vintage "Superex Jumpstart Compressor" that falls into this category. It contains an 18Ah sealed lead acid battery and weighs 21 pounds.



Superex Jumpstart and Compressor contains a sealed lead-acid battery.

Nowadays, this type of device is more likely to be powered by a lightweight lithium-ion battery. In the December 2020 *PCARA Update*, David KD2EVI mentioned the NOCO range of lithium jump starters and recommended less expensive battery booster units from DBPower.



Display of NOCO, EverStart, Schumaker and Battery Tender jump starters at Walmart.

You might be lucky and find a portable power station that *already* includes Anderson Powerpoles for the 12 volt supply — but these units are likely to be expensive. See the Goal Zero Yeti 1000X for an example, but don't look at the price. With other units, you might have to purchase or assemble a Powerpole adapter that plugs into the 12V DC supply connector.

A less expensive option could be to purchase a LiFePO₄ battery from Bioenno Power intended for amateur radio and already equipped with Anderson Powerpole connectors. These nominal 12V batteries are well suited to portable operation as they are lightweight and maintain a steady output voltage during discharge of 13.4 – 12.9 volts. There is plenty of advice on choosing the appropriate size battery on Bioenno's web site, <https://www.bioennopower.com/collections/lifepo4-batteries-for-communication-equipment-ham-radio>. Portable power boxes for Bioenno batteries are available from Powerwerx, or you can make your own using a simple tool box.



My own Bioenno BLF-1212A successfully powered the 2 meter FM transceiver that took part in the Simplex Challenge from Bear Mountain on April 16.

- NM9J

Peekskill / Cortlandt Amateur Radio Association

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Newsletter contributions are always very welcome!

Archive: <http://nm9j.com/pcara/newslett.htm>

PCARA Information

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

Organization. PCARA meetings take place every month (apart from July/August break). See <http://www.pcara.org> for current details.

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

Masks and Social Distancing may be required.

Sat May 6: PCARA meeting and Amateur Radio Q&A – “How to get started”. 10:00 a.m. Putnam Valley Library, 30 Oscawana Lake Rd, Putnam Valley, NY.

Sat May 6: PCARA VE Test Session, 11:30 a.m. Putnam Valley Library (see below).

Sun May 7: Orange County ARC Hamfest - Club table.

Sat May 13: PCARA Breakfast, 9:00 a.m., Downing Park Pavilion, 2881 Crompond Road, Yorktown Heights.

Sat May 13: PCARA Foxhunt. Starts 10:45 a.m. from Pool Parking Lot, FDR State Park, Yorktown.

Hamfests

Check with organizers before leaving.

Sun May 7: Orange County ARC Hamfest, Black Rock Fish and Game Club, 5 Pleasant Hill Rd, Mountainville, NY. 8:00 a.m. **Club table.**

Sat May 20: S. Berkshire ARC Hamfest, Goshen Fairgnds, 116 Old Middle St. (Rt 63) Goshen, CT. 8:00 a.m.

VE Test Sessions

Check with the contact before leaving.

May 6: PCARA, 11:30 a.m. Putnam Valley Library, 30 Oscawana Lake Rd, Putnam Valley, NY. Must contact VE. Mike W2IG, w2igg'at'yahoo.com.

May 6, 13, 20, 27, 31: Westchester ARC, 19 Hunts Bridge Rd, Yonkers NY. 11:00 a.m. Must contact VE, ac2t'at'arrl.net.

May 6, 13, 20, 27, 31: NYC-Westchester ARC, 43 Hart Ave, Yonkers NY. 12:00 noon. Must contact VE, k2ltm'at'aol.com.

May 7: Orange County ARC Hamfest, Black Rock Fish & Game Club, Mountainville NY. 9:00 a.m. Contact: w2bcc@arrl.net.

May 19: Orange County ARC, Munger Cottage, 40 Munger Dr Cornwall NY. 6:00 p.m. Contact: Joseph J. DeLorenzo, w2bcc@arrl.net.



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