



PCARA Update



Volume 25, Issue 4 Peekskill/Cortlandt Amateur Radio Association Inc. April 2024

Back to business

Our March PCARA Membership Meeting on Saturday March 16, 2024 at the Putnam Valley Free Library was very well attended with 14 members present. We discussed the 2 meter machine emergency replacement courtesy of Bob N2CBH and Malcolm NM9J. Bob had a unit on cold standby. Disaster averted! **Bravo Zulu.**



We learned that we're still financially solvent from Treasurer David KD2EVI and have sufficient funds for come what may.

PCARA welcomed a new member to the fold — **Scott KE2CNS** who just passed his Extra Exam. A discussion about HF antenna options for Scott's home-QTH ensued, which included diagrams, suggestions and detailed conversations.

One candidate was present for the PCARA ARRL **VE Test Session** at 11:30 a.m. and was successful in passing the Technician Examination. A warm welcome to Amateur Radio to **Todd KE2CZO**, whose vanity call is pending. Congratulations! Thanks to Mike W2IG and our team of VEs.



The March membership meeting and VE Test Session were back at Putnam Valley Library.

Please take a seat and strap yourselves in! We've got a bunch of upcoming events. Please mark your calendars with the following dates and times:

- Saturday April 20, 2024 at 10:15 am: PCARA **Membership Meeting** at the Putnam Valley Free Library in Putnam Valley, NY. [Includes **Baofeng workshop**. Bring Baofeng or similar HT for programming. -Ed.]



At PCARA's March 30th Breakfast, Mike N2HTT brought along a collection of Meshtastic 915 MHz low power long range mesh radios and their smartphone interfaces. Mike promises a future article on this growing technology.

- Saturday April 20, 2024 at 11:30 am: PCARA ARRL **VE Test Session** at the Putnam Valley Free Library in Putnam Valley, NY. Contact is Mike W2IG.
- Saturday April 27, 2024 at 9:00 am: PCARA **Breakfast** at Uncle Giuseppe's Marketplace in Yorktown Heights, NY.
- Monday April 29, 2024 at 7:00 pm: PCARA Laurel **VE Test Session** at the Putnam | Northern Westchester BOCES Tech Center in Yorktown Heights, NY. Please contact Dave KF2BD to register.
- Saturday May 4, 2024: 9:30 am: PCARA **Foxhunt** at FDR State Park in Yorktown Heights, NY. The fox will be hidden by Vincent KD2VAV. Please come out and join us. *Continued on page 2 ⇨*

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- Saturday May 4, 2024 at 10:30 am: PCARA participation in the “I Love My Park Day” clean-up at FDR State Park in Yorktown Heights, NY. (<https://www.ptny.org/events/i-love-my-park-day>).
- Sunday May 5, 2024: Orange County Amateur Radio Club (OCARC) **Hamfest** (<https://ocarcny.org/hamfest-2024/>) at the Black Rock Fish & Game Club, 5 Pleasant Hill Road, Mountainville, NY 10953. PCARA will be sponsoring two tables — so bring along anything you might have to sell.

Our next PCARA **Membership Meeting** is on Saturday April 20, 2024 at 10:15 am at the Putnam Valley Free Library on Oscawana Lake Road in Putnam Valley, NY. Please join us! I look forward to seeing each of you there!

- 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.

VE Test Session

PCARA’s latest Volunteer Examiner test session took place on Saturday March 16, following the monthly meeting at Putnam Valley Library. There was one candidate, Todd McCormack of Mahopac, NY. Todd passed the Element 2 examination and qualified for Technician. His new call sign KE2CZO was assigned by the FCC on March 21, 2024.

The March 16 test session was under the auspices of ARRL VEC, with Mike W2IG as Team Liaison. The

volunteer examiners present included Lou KD2ITZ, Rob AD2CT, Verle W2VJ, Ken W1YJ Joe W2BCC and NM9J.

PCARA’s next VE Test Session is scheduled for Saturday April 20th at Putnam Valley Library, starting at 11:30 a.m. This will be an ARRL-VEC session and candidates must contact Mike W2IG beforehand using w2igg@yahoo.com.

There will be a second VE Test Session in April, scheduled for Monday April 29th at Putnam | Northern Westchester BOCES Tech Center, 200 BOCES Drive, Yorktown Heights, Room 235, starting at 7:00 p.m. This will be a Laurel VEC Test Session (no test fee) and candidates must contact Dave KF2BD beforehand using daveharper@vivaldi.net.



Ken W1YJ was one of seven volunteer examiners at the March 16 VE Test Session.

Test review seminar

The Dutchess County Department of Emergency Response and the Mt. Beacon Amateur Radio Club will offer a free one-evening/two-day amateur “Radio license test review seminar” on Friday evening and Saturday/Sunday, 19-21 April 2024.

Times: Friday: 6:00 p.m. to 9:00 p.m.; Saturday: 8:00 a.m. to 5:00 p.m.; Sunday: 8:00 a.m. to 12 noon. FCC License Exam Session starts Sunday at 1:00 p.m.

Location: Dutchess County Department of Emergency Response, 392 Creek Road (near Dutchess Community College), Poughkeepsie, NY 12601. GPS: 41.7465676,-73.8983243.

Seminar is open to all without age limit and is for the entry level FCC Technician Class Amateur Radio License. Registration before April 1st is required.

Study the text before the seminar: “ARRL Ham Radio License Manual 5th Edition” from ARRL or Amazon.

For registration or additional information: contact: Adam Nowik Jr. 845-849-3666 or AE2AN@aol.com.

FCC License Exams on Sunday 1:00 p.m.: Open to all radio amateurs, regardless of whether they took the class. A \$15.00 FCC exam fee (cash or check) is due to take the test. Upon successful completion, a \$35.00 FCC license fee will be charged directly by the FCC for all new licenses. Test pre-registration required if not taking the class, contact: Andrew Schmidt 845-464-2676 or W2BOS@arrl.net.

Adventures in DXing

- N2KZ

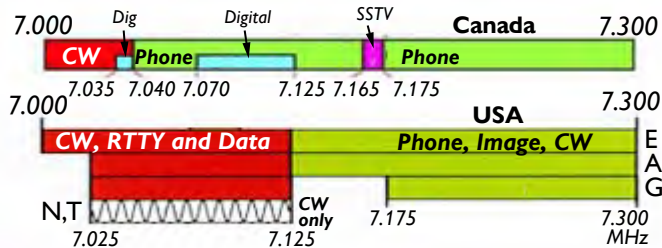
Always a Novice

Let me state the obvious: Amateur radio operators share this passion: above all else, we are fascinated with the magic we can create when we transmit a signal. It might wind up anywhere in the world — or beyond. And all the wondrous things we can hear in return!

I have been an amateur for 25 years and I still discover new things nearly every day. A current goal is to find shelter from the never-ending onslaught of new technologies. Can I co-exist in the world according to 2024 and still use my straight key?

Seeking asylum, I toured my old haunts to assess the status quo. The update left me more optimistic than expected. One thing I discovered consoled my soul. A small slice of 40 meters is still used by slow coders: 7100 to 7125 kHz. Years ago, this was possibly the most popular place for Novices and Technician Plus licenses to hone their new CW skills.

I am pleased to report that some of those folks have returned. In America, “CW operation is permitted on all amateur bands.” In theory, this may be true but you have to dodge everyone else who is clamoring for spectrum space! Canadian amateurs now operate phone all the way down to 7040 kHz, deep into the heart of Morse territory. They have a digital allocation from 7070 to 7125 kHz to add to the chaos. If you can find a clear frequency oasis, you can still have a lot of fun on 40 meter CW. Keep in mind, you may run into competition at any moment — so beware!



Top: band plan recommended by Radio Amateurs of Canada. Below: Band plan for U.S. Radio Amateurs showing emissions authorized by FCC Part 97.

Two things to be quite tolerant of: W1AW code practice broadcasts stop for no man! Beware when you are near 3.5815 and 7.0475 MHz. W1AW is confident and powerful. They assume their regular frequencies on schedule. You are fairly safe between 10:00 a.m. to 3:45 p.m. Eastern, when visiting operators take the helm at ARRL Headquarters in Newington, Connecticut. Look at their current complete schedule for details: <https://www.arrl.org/w1aw-operating-schedule>.

Part two? Digital operators usually don't monitor

frequencies before sending out their high baud pleas for attention. So goes life between about 7028 to 7125 kHz. If someone stomps on your QSO, you shuffle up or down frequency a little bit to complete your chat. It is reminiscent of the days when Novice operation required crystal control. When you sent CQ you would end with the letter U or D (for up or down) to indicate where you would be listening for replies. Now we get to do this when the QSOs are already in progress!

New Friends on 40

You will encounter all sorts of amateurs when you haunt 7100 to 7125 kHz. I especially like this segment when I look for newcomers and those who are reviving old skills. As a self-appointed Morse evangelist, I live to encourage any amateur who wants to master these ancient skills. A variant of this theme are those who have recently come back on the air or are trying out old-school “Novice” gear from the 1970s or older. A funky signal coming out of a Knight Kit T-60, an Eico 723 or an Ameco AC-1T is always a delight to work and talk about!

Wayne Gibbs, Jr. WN8BLX has a great call sign! That ‘N’ celebrates someone who was (maybe still is!) a Novice operator with a tip of the hat to a personal legacy from long ago. Novice licenses were issued from 1951 to 2000



although Novices can renew their licenses in perpetuity. Having a ‘N’ callsign indicates your seniority and your loyalty specifically to CW.

Hailing from Twin Lakes, Michigan, he was originally on the air in 1968 to 1970. Wayne retired from amateur radio for about 50 years and finally upgraded to General in 2019 — and — requested and was granted his original

call. What better souvenir of the past to enjoy every day you operate! Wayne often gets on the air from his admirable shack that is filled with legacy Drake gear — especially his Drake 2-NT Novice Transmitter. He has a nice collections of crystals, too!



Drake 2-NT Novice CW transmitter for 80-10 meters runs up to 100 watts input to a 6HF5.

Here's another new friend I met on 40 meter CW: Anthony Vitali KD8TFR

in Upper Arlington, Ohio shares the same spirit.

"In November 2023, I turned my attention to tube transmitters. I decided to take a chance on a Knight T-60 I found on eBay. The T-60 appealed to me because it looked like a simple rig and the one I found on eBay



Knight T-60 was a kit-built AM and CW transmitter covering 80 - 6 meters, running 60 watts to a 6DQ6 vacuum tube.

appeared to be in good physical and cosmetic condition." Anthony's T-60 is in perfect mint condition — almost right out of the box! After careful troubleshooting

and rebuilding, he brought it to a full life like it never had before.

"I had previously acquired a B&K 667 tube tester, and the purchase of the T-60 was the motivation I needed to get it working. Fortunately for me, the problem with the B&K checker was very simple and was resolved by cleaning the switches. The problem with my tester, the TEST switch was not making contact. With care, the switch was disassembled, cleaned, and reinstalled after extensive testing."

"Equipped with a working B&K tester, I received the T-60 and checked all of the tubes. I was pleased to find that they all tested good. After replacing out-of-spec resistors and capacitors, I was able to get the T-60 on the air but with not much more than 2-3 watts of power. I rechecked everything including all of the original build instructions but found no errors. So, I ordered a 6DQ6."

"While waiting for the tube to arrive, I found videos from MIKROWAVE1 (on YouTube) that showed him restoring a tube transmitter. In his videos, he demonstrated the impact that the crystal has on output power. So, I disassembled the one and only crystal I own. I cleaned the contacts inside of the case and gave the spring a little stretch. I retested and found that the T-60 was delivering 30 watts into 50 ohms."

It's alive! Congratulations, Anthony! What a great rig! For a nice introduction to the MIKROWAVE1 channel, take a look at: <https://youtu.be/akIXtbO1Ec8?si=nXast6SwkeFL-RDr>.

Drive South

Do you need a new perspective on life? Hop in your car and drive south for a few hours. My adventure started early! Driving down the Garden State Parkway, my wife and I actually saw a young coyote successfully run across the wide parkway as we drove through Park Ridge, New Jersey! The fun had only just begun.

Our first destination was the Cape May – Lewes

Ferry Terminal at the very southern tip of the Garden State. Drive your car onto the ferry and you will cross the mouth of Delaware Bay and arrive in Lewes, Delaware about 80 minutes later. What a beautiful trip!

While waiting for the ferry to load, my wife and I walked around the terminal docks and piers. I immediately noticed something quite unusual atop a nearby communication tower. It was a genuine bald



Eagle atop tower. [N2KZ pics.]

eagle keeping watch, looking for dinner. How magnificently it soared! Even better, we also saw what looked

like the world's largest final tube!

(It was actually a bumper for the ferries protected by long wood slats!)

The ferry was formidable! It can carry 800 people and 100 cars with each voyage.



Ferry bumper.

Ferry to Terminal is VHF Marine - Channel 7 - 156.35 MHz
Ferry to Ferry - Channels 10 and 11 - 156.5 and 156.55 MHz
Lewes, Delaware NOAA Weather Radio - WXJ94 - 162.55 MHz (Lewes is pronounced 'Louis'.)

Seagulls congregate by the dozens when they hear the ships' engines start up. Why? The ferry stirs up the waters from behind, bringing Atlantic silverside minnows up to the surface. Suddenly, fresh fish is on the menu... for the gulls! You will see masses of birds dive and compete for their newfound dinner, following the ferry for the entire voyage. Yum, yum! Silversides!

We timed our voyage perfectly to the evening's sunset. Beautiful moments and beautiful pictures! It was twilight by the time we drove off the ferry. Lewes, Delaware surprised us. Are we in Las Vegas? The main highway, Route 1, passes through several stunning, heavily-developed tourist centers, just filled with hotels and restaurants and brilliantly lit signs, as it finds its way all the way down the Delaware seashore.



Map shows locations visited by Karl in New Jersey, Delaware, Maryland and Virginia. [Base map Wikipedia CCA 3.0, cropped.]

Easy Listening

I caught an interesting FM station from Delmarva Public Media: WSDL 90.7 calling themselves 'Rhythm and News.' Indeed, they carry some of National Public Radio's news programs and local news along with very informed and interesting modern and classic jazz music and commentary. A refreshing format!

My DXing during this trip was spartan and simplistic. If you want to be polite (and stay married,) you really shouldn't drag transceivers, antennas and cables along with you on casual trips with the family. I always resort to using my very compact Sony SRF-M37W AM/FM/WB portable that fits in the palm of my hand. It has followed me all over the world!



Sony SRF-M37W stereo receiver covers AM, FM and weather band.

Listening to broadcast AM radio in seaside Delaware was fascinating. Dayside brought only the strongest New York City stations to my hotel balcony. I could hear WCBS 880, WFAN 660, WBBR 1130 and surprisingly WHLI 1100 '104.7 FM' Hempstead, Long Island. I also learned that many New York City AM stations have nearly identical signal patterns that favor the southeast into the Atlantic Ocean — that miss the Delaware/Maryland shore nearly completely.

For great insight to your reception anywhere you go in North America, try the invaluable <https://radio-locator.com>. Enter a call sign or location and you'll have quite a database at your fingertips. You can see very detailed information about every station and access their signal coverage maps for daytime and nighttime patterns. Brilliant!

The Delaware shore is only about 200 miles from most New York City AM broadcasters, yet it makes a world of difference in reception especially at night. At this distance, you are beyond most station's ground-wave signals and too close to properly hear skywave at night. It is almost like the New York City stations are off the air.

Overnight, I could hear WBZ 1030 Boston, WWL 870 New Orleans, 1120 KMOX St. Louis and WSM 650 Nashville with strong signals via skywave. I could even hear a Spanish speaking station under WSM but could not identify it. It was actually sometimes tough to hear relatively close KYW 1060 Philadelphia. Not enough skywave or ground wave! One big surprise was catching WFLF 540 Pine Hills (Orlando,) Florida loud and clear.

My very best reception was from the Atlantic View Hotel in Dewey Beach, Delaware. We had a room at the end of an elevated floor very close to the beach and

very far away from RFI. I could have stayed up all night DXing... but I fell asleep! I logged a low-powered Travelers Information Station one morning: WPFJ 1610 from Ocean City, Maryland. There was plenty to hear!

Nothing beats the reception that can be had when you are at the seashore. Make a day trip to Jones Beach on Long Island and try it out for yourself! Your daytime reception will reach up and down the entire East Coast. You can have a lot of fun digging out very distant AM station while seagulls 'caw' over your head.

Horsing Around

Head farther south down shore and you'll reach Ocean City, Maryland and even a tip of Virginia. A must-see attraction are two herds of wild horses that roam the oceanside sand dunes. We first went to Chincoteague, Virginia. A pontoon tour boat took us out to beautiful remote and untouched islands where the herds have lived free and unbridled for centuries.



Chincoteague tour boat with 'sailboat' antenna mounted to the hull at right. [N2KZ pics.]

The peaceful surroundings also hosted flocks of eagles and many other birds and creatures of nature. It was a most relaxing place, perfect for long contemplative visits with the sea. We

saw one bald eagle perched atop a waterway marker. I was so lucky to photograph its eventual launch and flight. A moment to remember! See



A bald eagle in flight. [N2KZ pic.]

the horses in action at: https://youtu.be/4tBp0FLXhbA?si=cWwmN_7rAj_E_Rsu.

How does a tourist boat stay in touch with the harbormaster? Our boat was fitted with an up-to-date Standard Horizon (Yaesu) Eclipse transceiver and a very close-by Shakespeare 5215-AIS 'sailboat antenna'



Standard Horizon Eclipse marine VHF FM radio is waterproof with DSC (digital selective calling) capabilities. [N2KZ pic.]

mounted to the ship's hull. The Chincoteague harbormaster monitors Channel 65 (new channel 1065) at 156.275 MHz

analog FM — the same frequency used by many other harbors in this area.

Shakespeare has been the standard go-to manufacturer of VHF marine antennas for decades and decades. During my trip, I discovered one truly innovative offering: The Shakespeare INFL8-5. You have to read their product description!

“Ideal for: Emergency Antenna, Backup Antenna, Kayaks, Jet Skis, Inflatables & Dinghies...

It is an inflatable antenna that can be rapidly deployed via a CO₂ cartridge or a manual tube and inflates to 5 ft (1.6 m) to offer a full 3dB antenna with a range of up to three times greater than any existing helical emergency antenna.” What will they think of next?

Our last full day down south was our best. We ventured back up from Virginia to Maryland to visit another herd of wild horses this time at The Assateague Island National Seashore. Many horses were seen grazing along the highway before we reached the very first parking lot! There are little clusters of them lazily grazing everywhere!



Shakespeare INFL8-5 inflatable marine band antenna. Versions are also available for air band and amateur radio 2 meter/440.

You'll find yourself surrounded by a meticulously maintained, serene yet narrow, seashore continuing for miles and miles. Chincoteague Bay is just steps away, right across the long peninsula, offering an entirely different experience than you would expect from a seashore.

The bayside is a wetland paradise teeming with flora and fauna featuring birds, fish and a myriad of other creatures. I was fascinated by the stunning wood walkways allowing you to stroll effortlessly deep into the wetlands. Eagles, ospreys and elegant bright white great egrets filled the trees all around. There were deer, fox, turtles, raccoons and more. What a wonderful world to visit! So many eagles.

Maybe it's time to plan your own adventures — near or far! There is a wonderful world out there for you to contact on the air. You know, you can visit these places, too! Enjoy your beautiful Spring and see you next month. 73 es dit dit de N2KZ — 'The Old Goat.'



Assateague Island horses. [N2KZ pic.]

NY QSO Party 2023

The latest New York QSO Party took place on Saturday October 21, 2023. Thanks to last year's calendar, this was the weekend *after* the 43rd Harry Chapin Run Against Hunger on Sunday October 15. Results from the 2023 QSO Party were published by the organizers on their web site, <https://nyqp.org> on March 22, 2024. 467 logs were received, down 22 from 2022.

There were two entries from PCARA members. **Joe WA2MCR** was unable to host contestants from his sun room in 2023. Instead, a limited-time operation took place from Joe's basement shack with assistance from NM9J, using a G5RV antenna and club call sign W2NYW. This result was initially missing from the official NYQP report, but thanks to Rus K2UA the 'Full Results' report and 'Full Score' listing now contain the W2NYW details.



Joe WA2MCR operating from his basement shack during the W2NYW club entry for the 2023 New York QSO Party.

To quote the NYQP report, "In the low-power multi-single category, we also had a single entry. WA2MCR and NM9J activated W2NYW from the Peekskill/Cortlandt ARA club station and won the category with a 23k score."

Low Power, Multi-Single

Call	Ph Q	CW Q	Tot Qs	Mults	Score
W2NYW	235	22	257	84	23,436

New record

The second entry by a PCARA member came from **David K2WPM** who operated portable from *two* locations — Trump Park, French Hill section (Westchester County) and Fahnestock Park (Putnam County). David's own report on his 2023 New York QSO Party effort follows **immediately** after this article.

The official NYQP report states: "Dave, K2WPM, did the NYQP's first two-county portable activation this year, putting Putnam and Westchester Counties on the air for a strong 680-QSO, 65.9k score. He set a new record for the low-power, mixed-mode portable cate-

gory in the process! Jack, WA2CHV, activated a cabin in Cattaraugus County and logged a solid 220 QSOs for 15k. Both ops put most of their time into the SSB segments of the bands."

Portable Low Power Mixed Mode

Call	PHQ	CWQ	TotalQ	Mult	Score	Mode
K2WPM	593	87	680	86	65,962	Mixed
WA2CHV	203	17	220	66	15,642	Mixed

Combined club

David K2WPM's entry and Joe WA2MCR's entry were added together for the **Club Competition**. The combined score of 89,482 points from two entries placed PCARA eighth out of 15 club entries. The table below is a partial extract from the NYQP report.

Club	Score	Entries
Niagara Frontier Radiosport	1,516,368	21
Hudson Valley Contesters and DXers	1,008,143	21
Rochester (NY) DX Assn	597,715	16
Frankford Radio Club	546,002	16
Order of Boiled Owls of New York	380,573	7
Yankee Clipper Contest Club	327,080	14
Potomac Valley Radio Club	110,080	12
Peekskill/Cortlandt ARA	89,482	2
Radio Central ARC and Order of Boiled Owls of NY	83,804	1

NYQP plaques

PCARA sponsored two **plaques** in the 2023 New York QSO Party. The plaque for Non-NY SSB Low Power will be awarded to Art, N3AAA from Washington, PA who scored 12,349 points from 233 QSOs. The plaque for NY Mixed Mode QRP will be awarded to William WB2SIH of Armonk, NY who scored 111,550 points from 705 QSOs.

The next New York QSO Party is scheduled for Saturday October 19, 2024, beginning at 1400 UTC. This will be the same weekend as the Harry Chapin Memorial Run Against Hunger on Sunday October 20, 2024.

- NM9J

How to win a QSO Party - K2WPM

Often, I am asked, how did I do so well in the 2023 New York QSO Party? Well, maybe “often” wouldn’t be the right word. More like “never asked.” But maybe I’ve grabbed you, and you’ll read the rest of this. Because it really is a template for something that worked, and worked well.

For the 2023 NYQP, I planned to operate **single operator – portable – low power – mixed**. For NYQP, “portable” is defined as follows:

A portable station is defined as one that operates from any non-permanent station location (e.g., home, club, or other established station). Portable stations may, but are not required to, change locations during the contest period. With each county change, the station may again make up to three mode contacts per band (CW, phone, RTTY/digital). Portables may operate from county lines as per “County Line” item in rules below.

Low power means 100 watts or less. **Mixed** means more than one mode; in my case SSB and my imitation of CW.

Research and planning

Almost as much fun as the actual QSO Party, is the research and planning for it. (Isn’t that so true of many things in life?) “Research and planning” in this case involves (a) where to operate and (b) how to operate.

Where to operate? Operating portable, I usually gravitate toward parks. In October, the crowds thin out. I can usually find a nice tall antenna hanger (sometimes called “trees,” by non-hams). This is, from my experience, the most important criterion. Get an antenna at least 35 feet high, and reasonably in the clear, and you have a decent chance to make some contacts. But since the QSO Party goes until well after dark (actually to 10:00 p.m.), it’s important to get permission to remain after the normal dawn-to-dusk hours. Those after-dark hours are critical, as I get much greater rates of QSOs after dark (see below).

I selected Trump State Park, off Baldwin Road, in Westchester County, to operate half the day. Then, Fahnestock State Park in Putnam County for the second half. I scoped out each park for nice high antenna hangers... about 40 feet in each case... and made sure I got written permission from the director at Fahnestock to operate well into the night. Yes, *written* permission; while operating portable, I have been questioned many times by law enforcement. It’s important to always have your license handy, and in this case, proof that you have permission to be there after dark.

Why multiple parks? The rules allow one to set up

portable at a single location. I always like to activate multiple locations because (a) it’s more of a challenge, and (b) you get to make new contacts with people with whom you had QSOs at the prior county, even on the same band and mode.

How to operate? The next part of the planning process is to determine what equipment you will use.

In my case, an Icom IC-7300 transceiver, on a 100Ah lithium iron phosphate battery. Would that provide enough juice for my expected 10 hours on-the-air? At 100 watts, the IC-7300 draws



Weize 12.8V 100Ah LiFePO₄ battery weighs 2.6 lbs and is less expensive than Bioenno. [K2WPM pic.]

a little over 20 amps on transmit; with a 50% duty cycle (half the time transmitting, half the time receiving), I calculated I would need 10 amps of DC per hour. That’s 100 ampere-hours total... probably just beyond the capacity of my battery. (From my experience, I can draw at least 90% of the rated capacity of a lithium battery before seeing a significant voltage drop — one of the many advantages of lithium-ion batteries). So I planned to charge it for an hour (4 amp charger plugged into inverter), while driving from one county to the other; and also bring a back-up battery. As it worked out, the 100Ah battery was sufficient, with the one hour of charging. Note to self: get a battery monitor (Hall sensor?) for next time, so I don’t need to guess.



DYKB battery monitor has a Hall effect sensor for contactless current measurement.

Antenna. The options are endless. Vertical or horizontal? Vehicle-mounted? Wire? Dipole or end-fed? I took out of consideration, setting up a directional Yagi or hexbeam type antenna. Too much effort! My swimming pool skimmer pole vertical is good, but only when it’s in the clear. So, a wire it is. My old standby was a linked dipole. See *PCARA Update*, April 2021, pp 9–11. But my current favorite is a 135-foot end-fed half wave (“EFHW”) into a 49:1 balun. A single wire, with nothing to do when changing bands from 80 to 10 meters. The feedpoint is at about 8 feet AGL, attached to a tripod and a 17-foot counterpoise on the ground. Easy set-up, easy take-down.

Shelter. I decided to operate from my car. The forecast called for some rain, and lots of cold. I've constructed a mobile cabinet, which occupies my passenger seat and holds the radio, and a tuner, if needed; it also provides a flat surface for logging, for my iPad and for the CW key. The 100



49:1 balun with EFHW wire attached, mounted on PVC tube and Pyle speaker tripod. [K2WPM pic.]

Ah battery sits nicely on the floor, and the coax feeds out through the slightly-cracked window. I tested the set-up to make sure I could run the car engine — to provide lights and warmth at night — and not get RFI. All good.



K2WPM mobile cabinet on the passenger seat houses the Icom IC-7300, iPad, log and CW key. [K2WPM pic.]

Results

For the first time ever, my operation was consistent with my plan. Nothing failed.

Set up at Trump Park went smoothly, and I was on the air at 10:00 a.m. I operated there for about five hours, doing a respectable 268 QSOs, on 20 and 40 meter SSB (197 QSOs) and CW (71 QSOs). That works out to about 54 QSOs per hour. I only needed to spot

myself a couple times, on the Parks on the Air (POTA) web page. I was surprised to see almost no activity on the New York QSO Party spotting page.

Take-down at Trump, driving to Fahnestock, and setting up there, took 1½ hours. But the very-accommodating tree limb at 40 feet, was happy to see me.

Unfortunately, the ditch where I needed to tie off the antenna was filled with three feet of very cold water! Note to self: always carry hip-wader boots! Brrr. The antenna went up on the first



K2WPM location at Pelton Pond parking lot in Fahnestock State Park. [K2WPM pic.]

“long john” sling shot, despite a large number of bystanders brought to the park by the sunny afternoon warm spell. Activities were slowed as I fielded a host of questions about ham radio. Being an ambassador for ham radio always takes priority over operating!

On the air from 4:30 till 9:30 p.m., it got cold and dark, real dark. I was happy to be in a warm car, and with lights. Note to self: bring lanterns next time. The pile-ups started almost immediately, and never subsided. My new Bencher ST-1 single-lever paddle died in mid-QSO (I am certain, operator error), shortening my CW efforts. Despite this, I was able to make 425 QSOs, about 85/hour, on 20 and 40 meter SSB (408 QSOs) and CW (17 QSOs). Around 9:20 p.m., I got tired and called it a day... 40 minutes before the event was scheduled to end, and while I still had nice pile-ups. For the last two hours, I was averaging 110 QSOs/hour! I never had a chance to try out 75/80 meters. Operator failure!

Did I win? Garnering almost 66,000 points, I eclipsed by fivefold the “portable” record I set in last year’s NYQP, and more than double any of the other operators in the nine categories of portable operations. Most of all, I had made a plan that actually worked! Ham radio is great fun. Especially when, at the end of the day, you are cold, hungry, tired and satisfied.

Now, to get started on next year...

- David K2WPM

Voicing complaints

Advancements in modern technology can be accompanied by their own problems. While it is mostly a case of “two steps forward, one step back”, occasionally “one step forward, two steps back” seems more appropriate. This may be the case with the latest work reported by Bert Firs, G2LPA.

Bert’s efforts on low profile antennas have been described previously in these pages^{1,2,3}. His radio interests have proved useful in his position at a U.K. laboratory conducting research into neoteric technology.

“We received an official inquiry one year ago,” said Bert. “The organization in question had been converting its analog radio-telephone system to digital voice and was having significant problems in the border regions. You may be aware that the British Isles contains several separate nations including England, Wales and Scotland — with borders located in hilly terrain. What makes those border areas distinct is their strong regional accents.”



The border regions of Scotland and England are located in hilly terrain (Southern Uplands, Cheviots).

“Unfortunately, the combination of poor radio coverage in the Scottish borders, multipath reception and broad accents was proving too much for current digital voice technology,” continued Bert. “The old analog equipment could just about pull a signal out of the noise, and dispatchers would make sense of it through their familiarity with voices of the mobile operators. But when the system was converted to digital voice with AMBE (advanced multi-band excitation) vocoder technology, the results were less than satisfactory. It was not helping that the Internet allowed dispatchers to be many miles away from their operational areas and unfamiliar with the local dialect.”

“The other part of the problem was the low data rate allocated to voice on those new radios,” said Bert. “Take a look at this table of bits per second and kilobits per second utilized by various transmission systems for the voice channel.”

System	Voice rate
DMR	3600 bps
P25 Phase II	3600 bps
Yaesu System Fusion Voice/Data	3600 bps
P25 Phase I	4400 bps
Yaesu Fusion Voice Full Rate	7200 bps
TETRA (European ‘P25’)	7200 bps
GSM Mobile phone	7.4 - 13 kbps
G.711 toll quality telephony	64 kbps
MP3	8 - 320 kbps
Compact Disk audio (stereo)	1411 kbps

“That low data rate of 3600 bits per second— including Forward Error Correction — is just about the limit for encoding human voice satisfactorily. It was dictated by government regulations requiring two digital voice channels in each 12½ kHz radio bandwidth. Once you begin losing data bits because of noise, interference, multipath distortion and network latency, the quality degrades rapidly.” Bert let out a sigh.

“I had a long discussion with my team,” continued Bert. “Was there a way to encode audio and still provide high quality reception at the other end of the radio link? One of my younger team members came up with the following suggestion.”

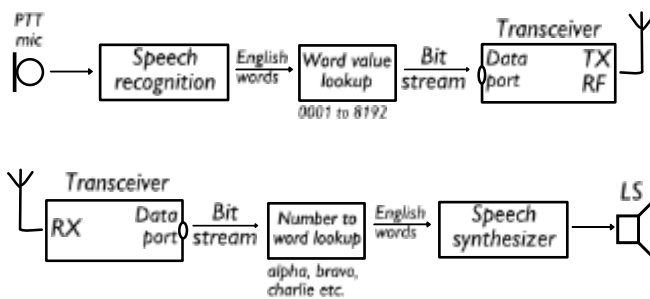
“In most public services, the language used is highly specialized and carefully controlled. One example is the use of just ninety-nine “10-codes” for standard messages used by U.S. Police Departments. Could we take this a step further and use speech recognition of common phrases spoken over the air, then transmit each phrase as a simple numeric code?”

Bert continued: “We set up a small test of the idea. The agency we were working with was recording all its radio messages in case of legal problems. We asked for a copy of their recordings covering a few weeks before they converted to digital voice. Those recordings were put through speech recognition software that could run on a notebook computer. The accuracy was not always good because of weak signals, but we discarded those messages. At the end of the analysis, we had a vocabulary of about 7,500 words — including over 250 local place names.”

APCO 10-Code List	
10-0	Use caution
10-1	Signal weak
10-2	Signal good
10-3	Stop transmitting
10-4	Message received
10-5	Relay
10-6	Station busy
10-7	Out of service
10-8	In service
10-9	Repeat
10-10	Fight in progress
10-11	Animal problem
10-12	Stand by
10-13	Report conditions
10-14	Prowler report
10-15	Civil disturbance
...	
10-94	Drag racing
10-95	Subject in custody
10-96	Detain subject
10-97	Test signal
10-98	Prisoner escape
10-99	Wanted or stolen

Warming to his theme, Bert described the first practical test. “We arranged a laboratory demonstration based on this analysis. On one side of the lab, we set up a mobile transceiver operating on the company Test and Development frequency. Microphone audio was diverted into our little notebook computer running the speech recognition software. Output was a string of simple numeric codes from 0001 to 8192 which was transmitted by routing the binary code into the radio’s data port.”

“On the other side of the lab we had a similar setup to reverse the process, with the radio’s data port connected to another notebook computer running speech synthesis software. Each binary code was converted into a spoken version of the word and routed to a hi-fi quality speaker.”



Block diagram of Bert’s team design for a digital voice radio-telephone system with speech recognition and lookup of standard words.

“We had chosen one of the speech synthesizer outputs based on the voice of a famous Shakespearean actor, so the received messages boomed out across the lab in his deep, resonant baritone.”



A Shakespearean actor with a deep, resonant voice.

“The data rate was slow — if the speaker was talking at a typical speed of 120 words per minute, that’s an average of two words per second, each of which only needed 13 bits to be transmitted. That rate of 26 bits per second is about four times the data rate of FT8. It did not overtax the radios, and we could add lots of error correction.”

“One of the junior team members was from Glasgow, so we asked him to speak a few typical radio messages into the microphone in his Scottish accent while we monitored reception. Speech recognition has been making great advances and the system performed well, recognizing 95% of his spoken words, including local

place names such as Kircudbright (“kur-KOO-bree”) and Sanquhar (“san-ker”). We could make perfect sense of the received text as it boomed out of the modified receiver’s loudspeaker.”

“Once we had this proof of concept, we prepared a working system to demonstrate to the agency concerned. This time we needed a base station that could receive and transmit, plus a mobile transceiver. We used a pair of commercial high band radios on our test frequency, interfaced to notebook computers for speech recognition and speech synthesizer functions. This equipment was installed temporarily at agency headquarters and we invited two of their dispatchers to attend the demonstration.”

Bert continued his tale. “We had one of the agency drivers out in a vehicle equipped with our modified mobile radio, and he was calling in typical messages to the base station. Once again, the received text was converted to perfect English and spoken out by our Shakespearean voice. The two dispatchers were shocked at the southern English accent, so we fixed that by switching the speech synthesizer over to the voice of a well-known Scottish actor.”



Scottish actor.

“All was going well until the vehicle driver entered a deep valley with poor radio coverage on high band. Despite the low data rate and error correction, reception was erratic, with whole 13-bit words going missing. The effect was worse than analog, with no rising background noise to indicate the signal was fading. Audio just dropped out without warning and remained silent until reception returned one or two words later.”

“The dispatchers and agency representative were unimpressed. We packed up the equipment and returned to the lab to decide on next steps. My colleague who



All was going well until the driver entered a deep valley with poor radio coverage.

had suggested the original speech recognition concept had another idea — perhaps we could use **artificial intelligence** to fill in the gaps between received words during periods of bad reception? I decided it was worth a try and left it as an assignment for the team while I went away on

my semi-annual visit to one of our overseas sites.”

“When I returned two weeks later, the project had been updated. The notebook computers now had external USB drives to store data for the new AI software. We arranged a lab demonstration for the agency representatives. The setup was similar to last time, with addition of a signal attenuator and adjustable noise source between the transceivers to simulate poor reception in a mountain area.”

“Our Glaswegian operator spoke into the microphone and a perfect rendition of his words emerged from the receiver’s loudspeaker...”

‘Mike two zulu kilo from mobile unit zulu charlie four seven, location is near Jedburgh at Rubers Law, report my signals, over.’

“As the signal-to-noise ratio was lowered, words began to disappear from the received message.”

‘Mike... kilo... zulu ...charlie four... Rubers... report... over.’

“Our team leader then switched on the artificial intelligence software to fill in the gaps in reception. This is what we heard:”

‘Mike mike three zulu kilo quebec, this is zulu mike four tango, your report five nine three two, three two, over.’

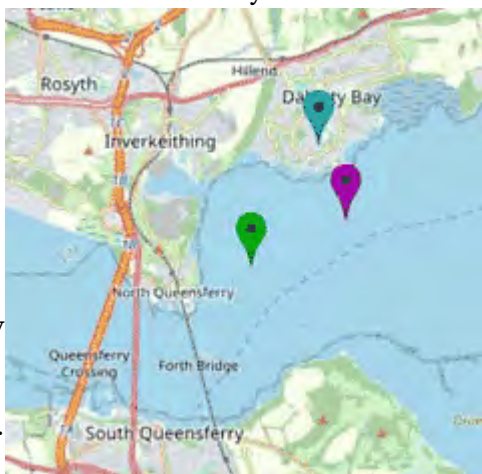
“The agency representatives were puzzled, then became annoyed as the AI software filled in more and more nonsense, followed by several mild swear words.

‘Zulu mike four tango from mike mike three zulu kilo quebec, please copy five nine one four, five nine one four over. OVER. D*mn this rubbish awful vox.’

After the agency observers had left the demonstration in disgust, I asked my team — fearing the worst — ‘**what did you use for training data?**’ ”

“The answer came back from my Scottish colleague...

“ ‘Bert — we were in a hurry to find authentic data, so I selected a Software Defined Radio off the Internet, located at Dalgety Bay, on the Firth of Forth near Edinburgh. We instructed the artificial intelligence software to look for two-



Map shows three different SDRs in Dalgety Bay, on the northern side of the Firth of Forth. [Credit: <https://rx-tx.info/map-sdr-points>]

way radio conversations, then apply speech recognition. That way we would be training the AI system on typical radio messages spoken in a Scottish accent. We simply left it running over the weekend...”

“My reply was — ‘Oh no! Did you not realize that last weekend was the CQ Worldwide SSB Contest? The amateur bands would be filled with rapid two-way radio exchanges of signal reports plus CQ Zones such as ‘05’, ‘14’ and ‘32’. The SDR you chose must have picked up all that activity rather than local VHF!’ ”

“Most of my colleagues looked puzzled at this, apart from the two who were also radio amateurs. The agency people went away in high dudgeon and did not return again. I believe they found a different solution to their coverage problems by changing frequency to low-band VHF in the 72 MHz region and adding a few more hilltop sites.”

Bert’s concluding remark was: “Never apply artificial intelligence unless there is an **adult** present. And I hate to think what my team will be getting up to during my **next** overseas visit starting April first.”



References

1. *PCARA Update*, April 2018 pp 11-14, “Seeing it through”.
2. *PCARA Update*, April 2019, pp 10-11, “Hooking back up”. See also *RadCom* April 1980.
3. *PCARA Update*, April 2023, pp 14-15, “Feeding your line”.

Shack spring clean

As the spring sun shines into your radio room, it may act as a reminder to carry out some routine maintenance. This article was prompted by a strange hummy-ticking sound that was coming from one of my 12-volt power supplies.

Quite a fan

I have an Astron SS-30M switch-mode power supply for the shack's VHF/UHF mobile radios. (It produces a little too much RF noise around 7 MHz for powering HF-band transceivers.) The unit has a cooling fan mounted on the back which should only run when an internal



Astron SS-30M switch-mode 12 volt 30 amp power supply. [Pics - NM9J]

thermostat senses that the temperature is too high. I had modified the original design according to a suggestion from NU4G on <https://www.repeater-builder.com>. A 120 ohm, 2 watt resistor wired across the thermostat switch causes the fan to run continuously at low speed, drawing air in and keeping the chassis cool.

After switching off, I inspected the SS-30M's fan, and found that a hairy, white beard of dust had built up all over the finger guard and on the fan blades. I used a can of "Dust Off" dust remover to blow the residue away, leaving everything bright and clean. Switching back on, the fan was running smoothly and the strange noise had disappeared.



*Large cooling fan on back of SS-30M power supply after cleaning. Unusually, this fan draws cool air **into** the chassis.*

This acted as a reminder to check other equipment in the radio room that has a cooling fan. You may be surprised how many items this applies to nowadays. My other 12V DC power supplies are Alinco DM-330MV switching units with a small fan on the back. The HF transceivers have cooling fans inside or

on the back. I counted more fans on the VHF/UHF mobile transceivers. If fans are left running continuously, they can also experience dust build-up.



Alinco DM-330MV 12V power supply has a small fan on the back.

Does not compute

Most radio rooms have one or more computers these days. Desktop computers have cooling fans that need to be cleaned out on a regular basis. There could be as many as four separate fans in a modern desktop. Notebook computers have their own internal fans. Make sure air intake vents are not blocked and use "canned air" (duster) to clean fan blades and CPU cooler fins.



This desktop computer has a chassis fan, a CPU fan and a third fan built-in to the graphics adapter, all arrowed. A fourth fan is inside the power supply.

A few words of warning about the use of "canned air" dusters. They are often based on difluoroethane, $C_2F_2H_4$, also known as HFC-152a and highly **flammable**. Do not blow this type of duster into equipment which is powered up, with the fan still running. There is always a chance that a small spark could ignite the vapor. **Switch off** first! Use short bursts and do not get too close to equipment with the blast from an aerosol duster — the evaporating liquid has a strong cooling effect and may generate static electricity that could damage sensitive components.

While checking your computer equipment, shake out any crumbs from the keyboard then use an aerosol duster to blow out residue. In-



'Dust Off' aerosol duster contains flammable difluoroethane.

spect the sliding feet underneath your mouse. You may be amazed how much 'crud' builds up under the shiny feet. You can scrape this off with a penknife blade.



Clean the sliding pads (arrowed) underneath your computer mouse.

Clean screen time

Much modern equipment — including computers, transceivers, scanners, oscilloscopes and meters — has an LCD screen nowadays. Sun shining into the shack may reveal yet another layer of dust on all those screens.



Spring sunshine can reveal a layer of dust on liquid crystal displays. Gross!

Take care with cleaning any LCD screen. General advice is to remove power, then clean surface dust off very gently with a clean, dry microfiber cloth. Microfiber cloths are made of very fine fibers of polyester (or a polyester blend) which traps and retains dirt without leaving any lint behind.

If there are permanent smudges or stains on the screen from fingerprints or liquid splashes, proceed with caution. Check the manufacturer's notes on cleaning, especially if the device is a touch-screen. Switch off and wipe the screen gently with a microfiber cloth moistened with pure water or with a cleaning solution rated safe for LCD screens. Do not spray directly onto the screen and stay well away from aggressive glass cleaners containing ammonia, ethanol, isopropanol or worse.



Microfiber cleaning cloths are recommended for LCD screens.

Remember that the structure of a liquid crystal display is made up of extremely thin layers of polarizing

film, glass substrate with attached electrodes and liquid crystal materials. Do not press too hard on the delicate surfaces.

Assault on batteries

After you have cleaned dust and dirt that has accumulated on shack surfaces, I would suggest one more item of preventive maintenance — a battery blitz.

The first thing to check is any equipment that contains disposable alkaline cells — usually in the form of AA, AAA and 9 volt batteries.



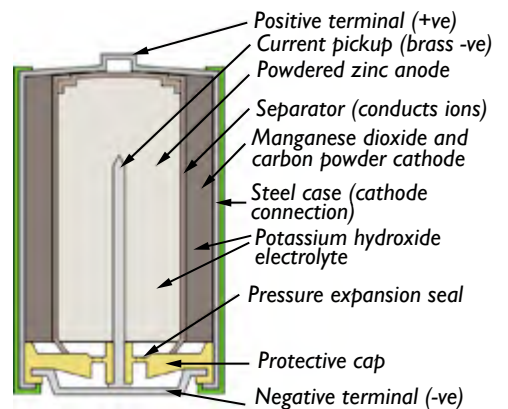
L to R: alkaline AAA cell, AA cell and 9 volt battery.

If left *in-situ*, these cells drain down and begin leaking a corrosive chemical that can attack metal contacts and nearby electronics.



Two AAA alkaline cells left inside a remote control that was not used for over a year.

A typical alkaline cell is housed in a steel case that forms the positive terminal. The cathode material consists of manganese dioxide (MnO_2) mixed with carbon powder for conductivity. The powdered zinc anode is separated from the cathode by an insulator



through which hydroxide ions (OH^-) can pass. Anode and cathode materials both contain potassium hydroxide (KOH) electrolyte solution.

Alkaline cell construction. [After Wikipedia, public domain.]

After discharge, the potassium hydroxide gel inside the cell eats away at the steel battery casing, building up pressure from hydrogen gas. This gas can push potassium hydroxide solution through the pressure expansion seals or through a break in the steel case. Once outside, potassium hydroxide reacts with carbon dioxide in the air to form white, crystalline, potassium carbonate.

If you encounter leaky alkaline cells, first remove the battery (or what is left of it). Avoid touching any corrosive liquid that might remain. Remove white powder from the metal contacts with a metal brush or old toothbrush. Use a dilute solution of vinegar or some DeoxIT® contact cleaner to clean residue left on the contacts.

Alkaline cell items

Here is my suggested list of items in and around the shack to check for exhausted alkaline batteries.

- Clocks with dial or LCD display
- Test equipment
- Multimeters
- Non-contact voltage testers
- Antenna analyzers
- Morse keyers
- Portable scanners
- Portable receivers (sometimes with C or D cells)
- Flashlights
- Illuminated magnifiers
- Weather stations (including outside sensor)
- Thermometers
- Remote controls
- Smoke alarms

Check cell voltage with a multimeter or battery tester. AA and AAA cells have a nominal cell voltage of 1.5V, falling below 1.0V when fully discharged.

When you change out an old AA, AAA or 9V battery, take the time to wipe the battery and device contacts with a dab of DeoxIT® contact cleaner. This will remove any oxidation and keep the metal surfaces clean for the life of the new battery. Exercise the controls and make sure the equipment is still operating satisfactorily.



DeoxIT contact cleaner.

Hint #1: for outdoor weather sensors use lithium AA cells — they will outlast alkaline cells many times over.

Hint #2: for seldom-used equipment, remove the alkaline cells and store in a sealed plastic bag.

Rechargeable battery items

The next list to check is any equipment that uses **rechargeable** batteries. They could be nickel cadmium (NiCd), nickel metal hydride (NiMH), lead-acid or lithium-ion (Li-ion) types. They can be found in:



HT with drop-in charger. Yaesu FT-70 has a lithium-ion battery.

- Handi-talkies
- Portable scanners
- NanoVNA
- Notebook computers
- GPS receivers
- Cameras
- Uninterruptible power supplies (UPS)
- Portable 12V power supplies

Nickel-cadmium and nickel metal hydride cells have a nominal cell voltage of 1.2V. Lead-acid cells have a nominal cell voltage of 2.0V. Lithium-ion cells have a cell voltage of 3.0 - 3.4V. Batteries of several cells in series will have a voltage that is some multiple of the individual cell voltage, for example 7.2V for a nickel metal hydride battery.

Pay special attention to equipment that has not been used in a while. Fully recharge and check for proper operation. Exercise the buttons to make sure all functions are still working well.

Coin cells

A final battery awareness check is to know about devices that make use of lithium **coin cells**. You may find these silvery discs backing up memory, keeping electronic clocks ticking and powering small devices. I have come across coin cells in...

- Calculators
- Computers (real-time clock/CMOS backup)
- Weather stations (clock backup)
- Small remote controls
- Smart key fobs
- Older transceivers (memory backup)

My suggestion — keep a small number of **CR2032** coin cells in stock, ready to replace any that become drained. The CR2032 is the most common size, with CR2025 and CR2016 occasionally encountered.

For coin cells, the “C” means lithium, “R” means round form while the numbers specify dimensions. The CR2032 is 20mm in diameter and 3.2mm high.

Nominal voltage for a single lithium coin cell is 3V.



Peekskill / Cortlandt Amateur Radio Association

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

PCARA on Facebook: <https://www.facebook.com/pcararadio>

YouTube Channel: <https://www.youtube.com/@peekskillcortlandtamateur7670>

PCARA Update Editor: Malcolm Pritchard, NM9J

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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

Sat Apr 20: PCARA Meeting & Baofeng workshop, 10:15 a.m., Putnam Valley Library, 30 Oscawana Lake Rd., Putnam Valley, NY.

Sat Apr 20: PCARA VE. Test Session, 11:30 a.m., Putnam Valley Library, 30 Oscawana Lake Rd., Putnam Valley, NY, see below.

Sat Apr 27: PCARA Breakfast, 9:00 a.m., Uncle Giuseppe's, 327 Downing Dr. Yorktown Heights, NY.

Mon Apr 29: PCARA VE. Test Session, 7:00 p.m. Putnam|N Westchester BOCES, Tech Center, 200 BOCES Drive, see below.

Sat May 4: PCARA Foxhunt and Park clean-up, FDR State Park.

Hamfests

Sun Apr 7: Southington ARA Flea Market, Southington High School, 720 Pleasant St., Southington CT. 8:30 a.m.

Sat Apr 20: Splitrock ARA NJ Tailgate Hamfest, Landing Pk Recn. Complex, 165 Landing Rd, Landing NJ. 8:00 a.m.

Sun May 5: Orange Cnty ARC Hamfest, Black Rock Fish & Game Club, 5 Pleasant Hill Rd, Mountainville, NY 8:00 a.m. **Club Tables.**

VE Test Sessions

Check with the contact before leaving.

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

Apr 11: WECA, Westch Cnty Fire Trg Center, 4 Dana Rd Valhalla NY. 7:00 p.m. Contact VE, N2gdy'at'weca.org.

Apr 19: Orange County ARC, Munger Cottage, 40 Munger Dr., Cornwall, NY. 6:00 p.m. Contact w2bcc'at'arrl.net.

Apr 20: PCARA, Putnam Valley Library, 30 Oscawana Lake Rd., Putnam Valley, NY, 11:30 a.m. Must contact VE. Mike W2IG, w2igg'at'yahoo.com.

Apr 29: PCARA, Putnam|N Westchester BOCES, Tech Center, 200 BOCES Drive, Yorktown Heights, Room 235. 7:00 p.m. Must contact VE. Dave KF2BD, daveharper'at'vivaldi.net.



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