PCARA Update

Volume 26, Issue 7 Peekskill/Cortlandt Amateur Radio Association Inc. July 2025

Near Field

The month of June began with a PCARA meeting on Saturday June 7 at Putnam Valley Library. Bob N2CBH reported on a visit to the 2 meter repeater and suggested that the antenna and feedline may need to be replaced. David KD2EVI and Bob are working on AllStar/Echolink access to the 2 meter repeater.

Lou KD2ITZ described the upcoming VE Test Session and subsequent events in June. He reported that ARRL Hudson Division Director Ed Wilson N2XDD has asked to attend a PCARA meeting, possibly in October.

There were three candidates and six volunteer examiners for the VE Test Session on June 7. For results, see the report on page 2.

PCARA Breakfast took place on Saturday June 21 outside Uncle Giuseppe's Marketplace in Yorktown. This was the first time in 2025 that the weather was warm enough to sit outside — and a new record of 21 people were present for June breakfast.

The pre-Field Day planning meeting took place on Wednesday June 25 outside George Washington Elementary School in Mohegan Lake. Twelve members were present and — in view of the weekend weather forecast — a decision was made to operate under cover from the front of the school.

ARRL Field Day began on Saturday June 28 at George Washington Elementary School. The weather was better than expected and a few equipment problems were worked around. Conditions steadily improved on the HF and VHF bands, allowing contacts

Members moved outside for PCARA's June 21 breakfast at Uncle Giuseppe's in Yorktown.

ARRL Field Day took place on June 28-29 at George Washington Elementary School in Mohegan Lake.

across most of North America. A big thank you goes to all 21+ members involved in making arrangements, lending equipment, erecting antennas and — most importantly — making contact with hundreds of other stations across the continent. See the full report on page 6 of this issue of the *PCARA Update* newsletter.

Following Field Day, Peekskill/Cortlandt Amateur Radio Association goes into Summer Break for the months of July and August. There are no monthly meetings and no newsletter until formal activities resume in September. The weekly nets on Tuesday and Thursday evenings continue, along with monthly Breakfasts at Uncle Giuseppe's.

There are several events worth adding to your calendar during the summer months. Please make a note of:

- Sunday July 13: Sussex

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County ARC Hamfest/ARRL Hudson Division Convention, Sussex County Fairgrounds, Augusta NJ. Open to buyers 8:00 a.m.

- Saturday July 19: PCARA Breakfast, 9:00 a.m. Uncle Giuseppe's Marketplace, Yorktown.
- Saturday July 26, New Jersey Antique RC Hamfest, InfoAge Museum, Wall Township NJ. 8:00 a.m.
- Saturday August 16,: PCARA Breakfast, 9:00 a.m. Uncle Giuseppe's Marketplace, Yorktown.
- August 21-24: Northeast HamXposition, Best Western Hotel & Trade Center, Marlborough, Mass.
- Sunday September 14, Mount Beacon ARC Hamfest, Knights of Columbus Hall, 339 NY Route 82, Hopewell Junction, NY. 8:00 a.m.

Watch for additional activities to be publicized through Google Groups e-mail and on the PCARA web sites. Enjoy the summer!

PCARA Board

President:
Greg Appleyard, KB2CQE; kb2cqe 'at' arrl.net
Vice President:
Bob Tarsio, N2CBH; bob 'at' broadcast-devices.com
Secretary:
Lou Cassetta, KD2ITZ; radiocassetta 'at' gmail.com
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Mike Dvorozniak, W2IG
Vice President Emeritus: Joe Calabrese, WA2MCR.

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 VE Test Session took place on Saturday June 7 at Putnam Valley Library, following the monthly meeting. There were three candidates and six Volunteer Examiners. This Laurel VEC test session was our third to employ "ExamTools" online system.

Ian Porteous of Hopewell Junction passed the Technician test. His new call sign **KE2GER** was assigned by the FCC on June 10, 2025.

James Rozen of Peekskill also passed the Technician test but qualified for **General**. This was because of FCC Rule 97.505A, which offers partial credit to an examinee with an expired General, Advanced, or Extra license granted before March 21, 1987. The Winter 1986 Callbook had proof of James' General class license **WA2ZRS** when he lived in Closter, NJ. James' new call sign **KE2GEV** was granted by the FCC on June 10. He requested his previous call sign **WA2ZRS** as a Vanity call and this was granted on July 1.

VE Test Session on June 7 at PV Library.

Elliot Camillo of Mahopac has been a familiar face at PCARA events, usually with Jennifer KE2AGN. Elliot also passed the Technician test. His new call sign **KE2GEQ** was assigned by the FCC on June 10. At the end of the session Elliot was presented with an ARRL Handbook, *ex-libris* Henry KB2VJP plus a Moonraker Titan 40W 10 meter transceiver (AM/FM/USB/LSB/CW) donated by Ray W2CH. Technicians have SSB/CW/RTTY/Data privileges on part of 10 meters.

Charles N2SO (left) presents the Moonraker Titan 10 meter transceiver to Elliot — now KE2GEQ — while David KD2EVI and Lou KD2ITZ look on.

Lou KD2ITZ was Laurel VEC Team Lead for the June 7 test session. The other Volunteer Examiners were Rob AD2CT, Joe W2BCC, Ken W1YJ, recent recruit Charles N2SO and NM9J. Joe W2BCC had once again brought 10-inch tablet PCs for use by the candidates, while the VEs employed notebook computers and smartphones to grade and sign the results. At the end of the session, results were transferred from ExamTools to Laurel VEC by Lou, KD2ITZ.

- NM9J

Adventures in DXing
- N2KZ

Strong Signals

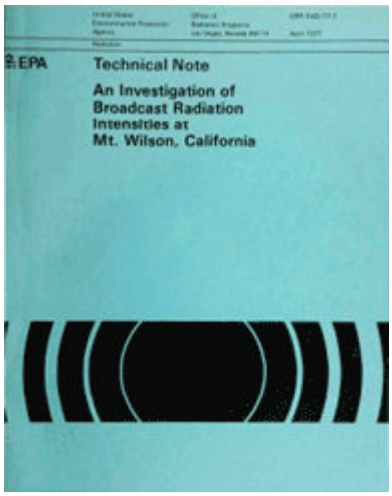
Where can you find the highest concentration of RF signals?

In the April 2025 edition of *PCARA Update*, you read all about hearing the **Voice of America**, without a radio, up in Schenectady, New York. Tens of thousands of watts pummelling mineral-filled rocks can produce eerie audio coming from seemingly nowhere. It can be quite a disarming experience!

There have been other powerful RF encounters. I remember my rental car radio nearly melting from RF when I reached the peak of Mount Wilson (outside of Los Angeles) back in the mid 1970s.

Multiple antennas on the summit of Mount Wilson, 5,400 ft above Los Angeles, California. *[Credit: CC BY 1.0, by Geographer, cropped.]*

This site hosts 15 major television broadcasters (9633 total kilowatts power) and 12 full power FM stations (creating quite a hardy collection of RF density in itself: 586 total kilowatts.) TV and FM altogether measures just over 10 full megawatts at 10219 kilowatts. (Source: EPA *Technical Note: An Investigation of Broadcast Radiation Intensities at Mt. Wilson, California – 1977,* https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=9100FEIS.TXT) This total does not include all the other utility users transmitting from this site.



I had fun trying to use a very early Motorola DynaTAC cellular phone from atop The Empire State Building in the early 1980s. It tried to link to a multitude of individual cells all at once. These phones were not meant for use at a height of 1250 feet! The view was spectacular but the amount of RF density was equally robust. This high was definitely too high!

DynaTAC cell phone.

I also had the experience of doing a TV remote shoot from the top of the old World Trade Center North Tower. We had trouble with the camera's viewfinder that not only showed the image we were pointing at but several other television images passing across the screen due to the incredible RF signal density. West Coast or East Coast, these are all places with serious RF!

Sony SRF-M37W AM/FM/weather Walkman. *[N2KZ pic.]*

Going very close to actual broadcast radio and television master transmission sites is cheating. How about just casual encounters with intense RF? My trusty little Sony SRF-M37W Walkman radio had quite a workout when scanning the FM band from a 12th floor apartment facing the famous N Seoul Tower in South Korea. Every broadcaster serving this metropolis was within sight. The radio's front end was overloaded beyond any form of attenuation. My little radio wasn't used to this kind of abuse! The amount of intermodulation was beyond belief.

A similar situation was encountered recently in Arlington, Virginia (right across the Potomac River from Georgetown — Northwest Washington D.C.) Here you'll find twelve local FMs at over 100 dBμV/m strength with local NPR outlet WETA 90.9 FM clocking in at a spectacular 117 dBμV/m! NOAA weather radio WNG736 on 162.450 MHz at 300 watts was also extra strong.

To put this in perspective, in downtown Peekskill, our single powerful local FM station, WHUD 100.7 has a field strength of 104 dBμV/m. Consider what it might be like if there were twelve stations of that power instead of just WHUD! You would have quite a lively band, offering many sources of news and entertainment — and — all sorts of by-products like intermodulation distortion. Looking for local RF overload? Drive up Perkins Drive to the Bear Mountain summit and take a listen!

All the signal strength data used here is culled from a brilliant application called *Radioland* authored by Nick Langan, W2NJL. This free download is an excellent reference tool revealing all the FM stations you might hear at your current location — or — you can

search other locations anywhere in the United States, Canada or even Mexico. Free downloads of *Radioland* are available at the Apple App Store for Apple devices or at Google Play for Android devices.

Ever Stronger

An all-time ultimate big signal experience was discovered on a recent trip to the Detroit, Michigan area. A good friend was in the process of 'cutting the cord' away from a cable bill of over $300 per month. A tiny Roku converter delivered lots of streaming video but lacked access to major network affiliates providing local news, sports, weather reports and exclusive nationwide programming. *You can see all these stations for free... if you watch them over-the-air!*

Starting from scratch, without any antenna handy, I hooked up an available left-over 15-foot F-connector cable to a Sony TV and put my finger on the bare wire center conductor on the far end. I thought this was pointless... but I gave it a try.

The end-fed finger antenna.

Surprise! I became the antenna! With grand optimism, I started a digital TV channel scan and I couldn't believe my eyes. 20 virtual channels popped up right away! Most wanted was the local ABC affiliate WXYZ. I removed my finger from the end of the cable and the signal still locked in! Amazing signal strength!

The experiment turned really silly. The F-connector cable still had a circle wind from the way it was packaged. Still coiled up, it was acting almost like a helix. We found one very particular spot on the floor where just the cable locked-in all the major local network affiliates. "Don't touch the cable!" We happily watched the Tony Awards on CBS in full-quality uncompressed 1080i HDTV and went to bed!

Off-air television reception in Michigan. Note the white coaxial cable at lower left of TV set. [N2KZ pic.]

It was not all magic. We were up about 50 feet over average terrain, sitting by a picturesque window overlooking Lake St. Clair and only about 15 miles from the transmitter. Nothing beats height and line-of-sight! We formalized the installation by later adding a bare-bones 'Best Buy' unamplified panel TV antenna. Our Sony TV only had one USB port for power (already used for the Roku box) — and — this antenna didn't require power — so it was a perfect match. A mini master antenna was born. I wish that all DTV antenna installations were this easy!

Best Buy essentials™ — multidirectional indoor HDTV Antenna offers up-to-30 mile range.

A little knowledge goes a long way with digital TV technology. Receiving today's over-the air television does not require any engineering background. You just have to be familiar with configuring today's TVs and have the proper materials available for your use. One added ingredient: location, location, location! Towering apartment buildings, or living on a big hill facing a local city, can also serve as very effective antenna sites. If you live behind a rocky hill or in a deep valley, adequate over-the-air reception may be difficult if not impossible.

Be prepared: You are an amateur radio operator with all sorts of tips, tricks and knowledge producing mesmerizing miracles! Everyone should have DTV antennas, coaxial cables and female to female F barrel connectors in their car trunks... right? This time I conjured magic that will be enjoyed for years to come! All that was needed was a short cable and a little indoor antenna. Big powerful signals make installations instantly satisfying and easy. (We should always be this lucky.) Television can be viewed without any subscription at all. I guess this is why they call it *wireless!*

New Clarity

Marketing amateur radio equipment can be challenging. A well-built rig can last a lifetime or more. How can you encourage customers to buy something brand new? *You've got to have a gimmick!* Designers are constantly developing new, must-have features to drive new sales.

Technical advances in digital signal processing have added extremely useful (and affordable) features within the grasp of even modest modern rigs. Today's bandpass filters work miracles when you need to dig

out marginal signals buried under all sorts of interference. How wonderful life is when you can continuously tune and create a custom filter perfect for this particular moment by touching a few buttons and some brief knob twists. These are features that are worth paying for!

Two relatively new features pertain solely to select Yaesu VHF/UHF FM gear: **A**udio **S**ignal **P**rocessing (ASP) — and — **S**uper **DX** (S-DX.) Who could resist claims that a new circuit can reveal signals that otherwise you cannot even hear?

These features are designed to process a standard analog FM signal to provide (hopefully miraculous) audio clarity. A small daughter board (Yaesu SPU-1) hosts the circuitry for this advanced audio signal processing. It is an all-inclusive little board that simply plugs into a motherboard that did not include this option previously. New rigs just out of the factory may offer the SPU-1 as an option or already fitted if the model includes the board directly.

Yaesu SPU-1 audio signal processor can be installed in the FT-3165, FT-3185, FTM-150, FTM-510.

The ASP feature can be continually left active. ASP will eliminate background white noise heard on weaker signals.

It will automatically switch on when it senses a weak signal. Conversely, the ASP will shut off when a signal is quite strong and not needed. You can also turn the feature on and off by manually pressing a physical button on the rig.

Press the [S-DX] key multiple times for access to the Yaesu FTM-150's Super-DX and ASP functions.

There are two caveats when using ASP. Like many other digital audio devices (like DMR radios) audio filtering processing only works effectively when signals are otherwise relatively clean and within a very specific range of signal strength. Some very wonky effects can be had if an incoming signal is too strong. Too weak signals may not provide enough information for the processing to work at all.

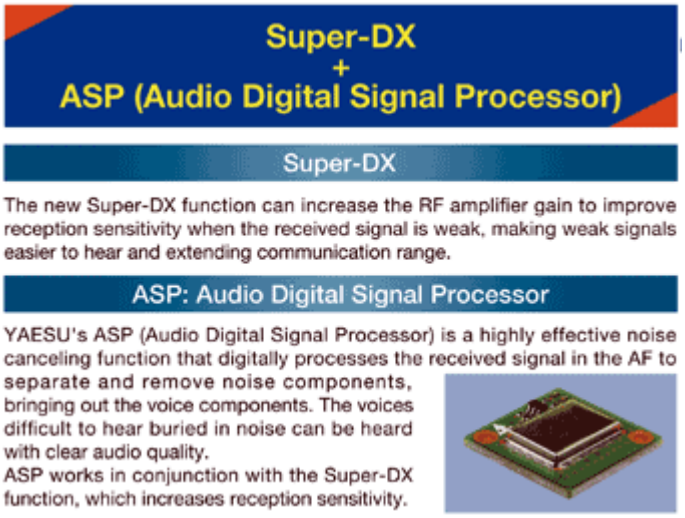
Converse to strong signals, your almost readable audio can completely disappear when already weak signals begin to fade away. Manually turn off the ASP and you will hear a much noisier signal... but you can still hear enough audio to get the message through!

Compared to other digital audio processing I have witnessed in devices like DMR radios, the Yaesu circuitry obviously makes strides forward in honing this art. You will enjoy the ability to manually switch the filtering on and off. More enjoyable is seeing how the circuit will do a multitude of sensing and intelligent filtering at different levels all by itself. The Yaesu SPU-1 isn't perfect but it is getting closer.

Yaesu's technical brief offers these details:

"The SPU-1 module can be installed as an accessory in non-ASP transceivers turning them into full featured ASP transceivers: the FT-3165, FT-3185, FTM-150, FTM-510 and perhaps other upcoming Yaesu transceivers that are without the ASP from the factory.

"The Super-DX function increases the receiver sensitivity and improves weak signal reception. The new ASP: Audio Digital Signal Processing Unit is also activated when the Super-DX key is pressed. The Super-DX with the ASP ensures reliable audio quality for weak signals and expands the communication range."



Explanation of Super-DX and Audio Digital Signal Processor from the Yaesu FTM-150 brochure. [Yaesu]

You can be the judge by witnessing a good demonstration of these new features: https://youtu.be/T-m1BxWgkaDk?si=XH2H9tNkqz2o86A7. Depending on your personal operating preferences, you might see the new Yaesu ASP & S-DX feature to be a breakthrough or maybe just another spanner in your toolbox. In any case, some applause should be heard for Yaesu's noble try to improve their VHF/UHF products.

Wishing you an enjoyable summer...73 ES DIT DIT DE N2KZ. See you in September!

Field Day 2025

Preparation for ARRL Field Day 2025 began in March with Joe WA2MCR applying to Lakeland Central School District for permission to operate from George Washington Elementary School in Mohegan Lake. Joe requested location either in the field behind the school *or* at the front entrance.

Discussions took place at the June monthly meeting then continued during an on-site planning meeting on Wednesday evening, June 25. In view of the stormy forecast, we decided to locate stations under the canopy at the front of the school.

On-site planning meeting at George Washington Elementary School, June 25.

Todd N2MUZ arranged for media publicity in local editions of the "Patch" community news sites while Karl N2KZ added social media postings about the event to PCARA's Facebook page.

Saturday set-up

Following overnight rain, loading began on a cool, cloudy Saturday June 28 at Joe WA2MCR's location. Joe had reduced his Field Day equipment to two plastic storage boxes plus chairs and tables. They were soon loaded onto Bob N2CBH's truck. Remaining equipment was taken to the site by David KD2EVI and by NM9J, with additional tables supplied by other members.

Setup began around 9:30 a.m. at George Washington Elementary School. Tables and chairs were arranged under the canopy, followed by the plastic storage bins containing radio equipment. Members present at the start of setup included Mike N2EAB, Ray W2CH, Marylyn KC2NKU, David KD2EVI, John KE2DTY, Rob AD2CT, Todd N2MUZ and Greg KB2CQE.

After posting club signs, the next task was installation of antennas, using nearby trees and the school flagpole. Mike N2EAB launched nylon monofilament

Setup begins under the school covered entrance.

line over each tree branch then pulled up heavier paracord to support antennas — including his own 6 meter wire loop. This VHF antenna was significantly higher than last time, clearing the roof of the school building, with rotation courtesy of an attached cord.

Todd N2MUZ pulled up the G5RV antenna between the third tree south of the school entrance and the flagpole.

Todd N2MUZ begins raising the HF antennas.

Meanwhile Mike had launched another line over a tree at the NW corner of the school grounds for the multiband, fan dipole. (After falling apart in 2024, this

Multiband fan dipole attracted some interest. [AD2CT pic.]

antenna for 40 - 10 meters had been refurbished — see "Multiband Dipole Revisited", *PCARA Update* September 2024 pp 14-18 for details.) Antenna raising was interrupted by a USPS mail truck driving past the school entrance and threatening to run over the fan dipole's coaxial cable.

A white Postal Service mail van threatens to run over the RG-8X coaxial cable feeding the fan dipole.

All three stations allowed by PCARA's Class 2A entry were being set up on tables under the covered entrance. Joe WA2MCR assembled his Icom IC-7410 transceiver for HF operation on the G5RV antenna. David KD2EVI set up the Yaesu FT-450D, ex-Henry KB2VJP (SK), for use with the multiband HF fan dipole while NM9J prepared the Yaesu FT-897D, also ex-KB2VJP, as the "free" VHF station, attached to the wire loop antenna for 6 meter operation.

Each radio had its own notebook computer for digital modes plus a copy of N3FJP's ARRL Field Day Contest log software, networked to a central "file server" for collection of log data from all three stations.

Todd N2MUZ at the VHF station computer (left); network server with UPS (center right) and computer for the IC-7410 in front of Ray and Marylyn (far right).

David KD2EVI had to make a run back home for the Yaesu SCU-17 USB Interface Unit that allows each Yaesu radio to have a USB (Universal Serial Bus) connection for CAT (Computer Aided Transceiver) control of the radio and audio input/output. David had updated and tested the radio software on his Acer Aspire notebook but unfortunately, on Field Day, the USB connection stopped working, and resisted all efforts to fix it. As a result, digital modes using WSJT-X for FT8 or Fldigi for the CW reader were unavailable on the Yaesu FT-450D.

Yaesu SCU-17 USB Interface Unit for FT-450D or FT-897D.

David had setup his Homelite AC generator, along with a sign about use of the choke for restarting. Generator, fuel and extinguisher were located around the corner of the school to reduce audible noise. Bob N2CBH had volunteered as Safety Officer and checked that generator and fuel were well apart. Bob also arranged AC wiring to the stations and was careful to keep all cables — power, coaxial and local area network — separated from people and well-marked to avoid accidents.

Bob N2CBH checks the AC generator.

During station setup we had a visit from ARRL's Vice Director - Hudson Division **David Galletly, KM2O** who had driven down from near Albany, NY.

David KM2O, Hudson Division Vice Director (center) meets members of the PCARA team.

On the air

Following a mid-day food run by Todd N2MUZ for lunchtime sandwiches, radio activity started at 2:00 p.m. Eastern. Joe's Icom IC-7410 began on 20 meter phone using the G5RV antenna. Despite being close to solar maximum, HF band conditions were not great at the beginning of the contest, with weak, fading signals. The same conditions were apparent at the Yaesu FT-450D, operated by David KD2EVI on 40 meter phone using the multiband fan dipole.

Elliot KE2GEQ logs while David KD2EVI operates the Yaesu FT-450D transceiver on 40 meter phone.

Meanwhile, the 'free' VHF station allowed by Class 2A was under the control of Rob AD2CT. With the Yaesu FT-897D operating FT8 on 50.313 MHz, conditions were rather better, allowing early contacts to North Florida, South Carolina and Alabama on the 6 meter wire loop.

Rob AD2CT watches for contacts at the 'free' VHF station, operating digital mode FT8 on 6 meters.

After the cool, overcast start to the day, the sun appeared around 3:00 p.m., HF conditions began to improve and the scoring rate picked up. Several visitors came by who had not been seen in a while including Clint KB2ZRJ and Jennifer KE2AGN. Later on Sunday, another welcome visitor was Verle W2VJ.

The generator ran out of fuel at 5:00 p.m., causing two of the notebook computers to lose USB connection to their attached transceivers. After refueling, the software was restarted and operation resumed. By 7:00 p.m. the temperature had risen to 82°F and a number of people (your Editor included) had left for sustenance, leaving just a small corps of operators.

As the evening progressed, more members returned, lights were switched on and Joe WA2MCR made several CW contacts from the IC-7410 on 20 meters, followed by a band change to 80 meter SSB, still on the G5RV antenna. This required a different choice of external filter. Once again, we were using bandpass filters by Array Solutions and Dunestar to prevent wideband noise and strong signals from one transmitter overpowering the receivers on a different band. The two HF antennas had been distanced from the common flagpole and arranged in-line to minimize interaction.

On Saturday evening Joe WA2MCR was operating on 20 meter CW and 80 meters, accompanied by Alan.

ARRL Headquarters' Station W1AW (Class 6F) was worked overnight on both 80 meter and 40 meter phone. In addition to the squawks of SSB, the evening was interrupted by the sirens of emergency vehicles and the roar of 'hot-rods' speeding up and down Lexington Avenue, followed by the boom of fireworks exploding in advance of Independence Day.

Night descends

After 10:00 p.m. most visitors had left for the night, leaving a small number of dedicated operators to keep the stations running on 40 meters and 80 meters. Those present overnight included David KD2EVI, Mike N2EAB, Todd N2MUZ, Elliot KE2GEQ and Ken W1YJ.

The overnight crew reported various airborne visitors including bats, beetles and biting mosquitoes. The 80 meter band had lots of duplicates then faded out around 3:00 p.m. — so the IC-7410 was switched back to 20 meters.

Day breaks

Your editor returned to the Field Day site around 7:00 a.m. on Sunday morning. The day was brighter, with temperatures rising from 70°F in the morning to

85°F in the afternoon. One advantage of the school's entrance canopy is that it blocks sunlight from computer screens — while the supporting columns allow a gentle breeze to keep operators and equipment comfortable. In contrast to previous years, no additional cooling fans were needed for Field Day 2025.

Daytime dots and dashes

Because of the lack of a USB computer connection, only SSB phone operation had taken place from the FT-450D on 40 meters. With the station quiet, I connected my MFJ paddle and CMOS Super Keyer II memory keyer to the Yaesu FT-450D, changed mode then settled down for some **computer-unassisted** CW contacts. Conditions were quite satisfactory, with plenty of 40 meter CW stations to work, some running at *very* high speed.

CMOS Super Keyer II wired to Yaesu FT-450D [AD2CT pic.]

Since we were close to sunspot maximum, there should have been activity on the higher HF bands. After 10:00 a.m. I changed filters and moved the FT-450D to 15 meters. There were a few, weak stations on SSB, but considerably more on CW. I also checked 10 meters, but worked just one CW station on the multiband fan dipole.

Mike KD2OUG had found activity slowing down on 20 meter SSB, so I transferred my keyer over to the Icom IC-7410 transceiver and picked up more points on 20 meter CW using the G5RV antenna. Meanwhile Mike moved over to the FT-450D to continue his good work on 40 meter SSB. As a final flourish, the IC-7410 was switched to 15 meter FT8 using the WSJT-X software installed on Joe WA2MCR's notebook computer.

Teardown time

At 2:00 p.m. on Sunday afternoon, Field Day was over, the logging programs were closed and the central network server was secured. Antennas were brought down and stowed in containers, coaxial cables were coiled up and the three stations were disassembled. For the second year, the shielded Cat 5E network cable to the FT-450D station became jammed in the Acer notebook's RJ-45 socket and had to be pried out. By 2:55 p.m. the site had been cleared of radios, antennas, chairs and tables, with everything loaded onto individual vehicles. This year there was no rental van to return to U-Haul.

Results

A total of **21** radio amateurs took part in PCARA's 2025 Field Day event, along with a visit from a representative of the Hudson Division and several site visitors. The QSO count reported by N3FJP's software was **113** CW, **80** Digital plus **406** phone, making a total of 599 QSOs.

Bonus points were claimed for copying the W1AW bulletin (100 points), 100% Emergency Power (200 points, class 2A), Media Publicity (tnx N2MUZ), Public Place, Public Information Table, Publicity through Social Media (tnx N2KZ), Safety Officer (tnx N2CBH) — all 100 points each. No points could be claimed for Youth Participation or for Natural Power contacts.

PCARA's entry was submitted on July 3rd through the ARRL web site for an additional 50 points, making 850 bonus points in all. Here is a summary of the claimed points for 2025 (**bold** column below) along with a comparison of scores from previous years and a breakdown by band and operator.

Peekskill/Cortlandt ARA, W2NYW, Class 2A

	2002	2003	2004	2005	2007	2008	2009	2011	2012
QSO pts:	718	733	968	853	1019	1109	694	879	968
Power:	2 (<150W)								
Partcpts:	15	11	12	10	14	10	10	14	15
Tot scor:	2,096	2,328	2,996	2,798	2,906	3,460	2,746	2,602	2,920

	2013 (1A)	2014	2016	2017	2018	2019	2021	2022
QSO pts:	775	722	816	813	731	829	1366	712
Power:	2 (<150W)							100W
Participts:	14	16	19	22	22	29	25	24
Tot scor:	2040	2460	3018	2734	2886	2764	3662	2234

	2023	2024	**2025**
QSO points:	940	1060	**792**
Power:	100W	100W	**100W**
Participants:	27	19	**21**
Total score:	2810	3090	**2434**

Breakdown by band, in order of QSO number

40 meters – 235 QSOs;	20 meters – 139 QSOs
80 meters – 132 QSOs;	6 meters – 48 QSOs
15 meters – 33 QSOs	10 meters – 1 QSO

Breakdown by operator in order of QSO number

Operator	**QSOs**	**%**	**Operator**	**QSOs**	**%**
NM9J	127	21	N2MUZ	91	15
KD2EVI	71	12	KD2OUG	67	11
N2EAB	59	10	W2CH	56	9
AD2CT	40	7	N2CBH	34	6
WA2MCR	33	6	KE2GEQ	12	2
W1YJ	9	2			

The breakdown by operator may not be completely accurate as some members forgot to update their callsign and initials in the N3FJP logging software.

(Charles N2SO has submitted a *separate* entry to ARRL from his Class 1D home station for addition to PCARA's Aggregate Club Score.)

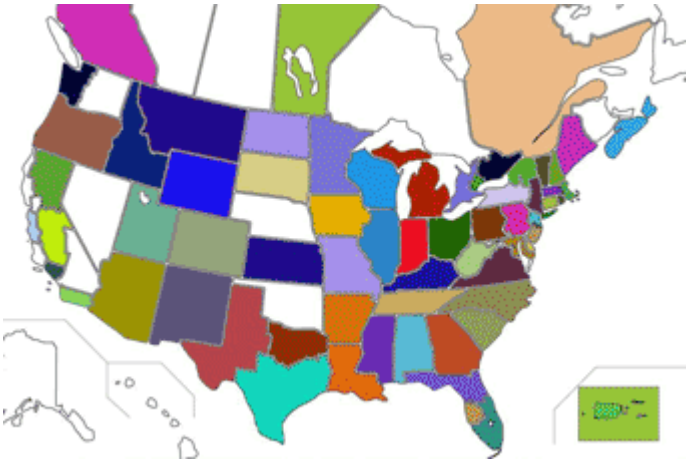
Thank you, one and all

PCARA's claimed score for Field Day 2025 was a little less than our near-record score from 2024. Some members had unavoidable responsibilities away from the site over the busy summer weekend. Nevertheless there was a substantial effort from everyone who participated, whether all day long, all night long, in the background or for whatever time they had available.

Many thanks to everyone who contributed including: Joe WA2MCR, Bob N2CBH, Mike N2EAB, Ray W2CH, Marylyn KC2NKU, David KD2EVI, John KE2DTY, Rob, AD2CT, Greg, KB2CQE, Elliot, KE2GEQ, Jared, KD2HXZ, Jay, NE2Q, Clint, KB2ZRJ, Jennifer, KE2AGN, Greg, KB2CQE, Mike, KD2OUG, Todd, N2MUZ, Ken W1YJ, Nic KD2SKY, and Verle W2VJ.

Final thoughts

Analysis of results from the N3FJP contest software show that our three stations with wire antennas produced good coverage over the continent, from New England in the east, to the south and southwest, out to the west coast and north toward Canada.



*Map shows ARRL and RAC Sections worked by W2NYW during Field Day 2025. Coverage of the midwest and west coast was **better** than in 2024.*

The 'free' VHF station reached out on 50 MHz FT8 to **19** ARRL Sections: AL, AR, CT, EMA, ENY, EPA, IL, MDC, MO, NFL, NH, NLI, NNJ, RI, SC, SNJ, WCF, WMA and WNY.

Location, location: PCARA's fourth Field Day at George Washington Elementary School demonstrated the advantage of locating at the front of the school under the large entrance shelter, with no tents to erect, protection from the weather and bright sunlight excluded. Convenient antenna supports are nearby, with easy access from Lexington Avenue for visitors and participants. Because school term had only just finished, David KD2EVI had to site the portable toilet a few minutes' walk away behind the school — but at least this location provided an exercise break after long hours sitting down at an operating position.

The covered entrance to George Washington Elementary School provides several advantages for Field Day.

Modes: While most PCARA members are happy to operate on HF/VHF phone, not everyone is familiar with the digital modes. WSJT-X's FT8 and FT4 modes have become increasingly significant for Field Day — especially on the VHF bands — so even if you do not enjoy this type of operation, it could be worth understanding how it works. Nowadays, even fewer members operate on CW — we need more Morse ops! (Technicians have access to 28.0 – 28.5 MHz with allocations for CW and data as well as for SSB phone.)

Radio *Dis*connect: There were a few equipment problems during 2025 Field Day, partly caused by our older Yaesu radios with no built-in USB port and partly by older computers with limited capabilities.

Bear in mind that, for the most part, members bring their **own equipment** to Field Day — where it has to be left out in the open for anyone to operate over a period of 24 hours. You might not want to expose your latest technology to bugs, brute force or bad weather. (Suggestions for improvement in this area will always be welcome.)

By the way, computers running Microsoft Windows 10 that cannot be upgraded to Windows 11 will be out-of-support after October 14, 2025 — so why not donate a superior vintage notebook computer for future Field Days? It just needs the Field Day software, a wired network connection and integration with the appropriate transceiver.

Field Day finish: A few more operators, some extra bonus points, improved equipment and exploitation of all available modes could bring a boost for 2026, especially if good conditions prevail on HF/VHF.

- Malcolm, NM9J

Sodium-ion update

Sodium-ion batteries have been in the news recently. Past issues of *PCARA Update* have reported on this low-cost alternative to lithium-ion batteries.

Better batteries, *PCARA Update*, January 2021 p 11, explained how sodium-ion batteries based on Prussian blue analogs were being developed by **Natron Energy** in Santa Clara, CA.

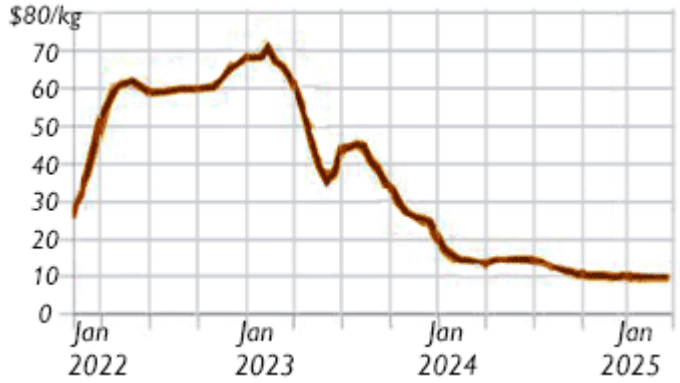
More better batteries, *PCARA Update*, July 2021, pp 16-17, described further developments in sodium-ion batteries by British company **Faradion**, using a cathode made of a layered oxide such as sodium/nickel/manganese/magnesium/titanium oxide.

Sodium ion progress, *PCARA Update*, March 2023, pp 9-12, reported on **Natron Energy** launching larger battery storage cabinets and planning a manufacturing plant in Holland MI. Meanwhile Faradion was being acquired by Indian company Reliance Industries Limited. Swedish Company **Altris Energy** was developing a sodium-ion battery based on "Prussian White". And China's Contemporary Amperex Technology Co. Limited (**CATL**) was about to start mass production of sodium-ion vehicle batteries in 2023.

(For editions of the newsletter no longer available online, contact the Editor.)

Why better?

Several advantages are claimed for sodium-ion batteries, compared to lithium-ion. Low temperature performance and fast charge/discharge are better for sodium-ion. The technology is safer than lithium-ion with less tendency to thermal runaway and bursting into flames. No conflict-minerals such as cobalt or nickel compounds are involved in their manufacture. Sodium is widely available around the world compared to the relatively few countries with lithium deposits or lithium-containing brine — mainly Australia, Chile and China. A few years ago, the price of lithium was soaring as demand began to outstrip supply. As a result, interest in sodium-ion batteries suddenly increased and several companies announced their intention to manufacture sodium batteries for electric vehicles.



Price of lithium carbonate in dollars per kilogram.

In recent months, sales of electrical vehicles have slowed while lithium production has increased. Reasons for the sales decline include high purchase price, limited range, lack of charging stations, diminishing tax credits and risk of battery fires.

As a result, the price of lithium carbonate has fallen from $71 per kilogram in 2022 to $8 per kilogram in June 2025. This is still nowhere near as cheap as sodium carbonate at $0.20 per kilogram. But the incentive to switch to sodium has now shrunk and — without mass production — the price of a sodium-ion battery is still higher than a similar lithium-ion pack.

Not better?

The main disadvantage of sodium-ion batteries is lower **energy density** than lithium-ion, as shown in this table from *PCARA Update*, March 2023.

Chemistry	Energy density *watt-hour/kg*
Lead acid battery	25-40 W·h/kg
Nickel metal hydride battery	50-70 W·h/kg
Sodium ion battery	70-160 W·h/kg
Lithium iron phosphate $LiFePO_4$	90-160 W·h/kg
Lithium ion $LiCoO_2$	195 W·h/kg
Lithium Ni Co Mn oxide	205 W·h/kg
Lithium Ni Co Al oxide	220 W·h/kg

Natron

In April 2024, Natron Energy of Santa Clara, CA announced that commercial production of its sodium-ion batteries had commenced in Holland, Michigan. Natron had invested more than $40 million to upgrade part of an existing lithium-ion battery plant owned by Clarios International, using Natron's Prussian blue electrode technology. Natron could point out their lack of dependence on expensive lithium or on "conflict minerals" such as cobalt and nickel. Instead, their technology makes use of aluminum, iron, manganese and sodium compounds.

Natron Energy's first commercial-scale production plant for sodium-ion batteries in Holland, MI. *[Credit: Natron]*

In August 2024, Natron Energy announced plans to build a sodium-ion "Gigafactory" on Kingsboro Business Park, near Rocky Mount, NC. The new plant would have 40 times the capacity of Natron's Michigan site. (Funding for this project may be affected by removal of Federal Government support for Inflation Reduction Act projects.)

Natron Energy BluePack™ critical power battery for static use survives >50,000 deep discharge cycles. [Natron]

In March 2025, Natron announced a partnership with Draslovka a.s. to develop and manufacture Prussian blue material at Draslovka's site in Kolin, Czech Republic.

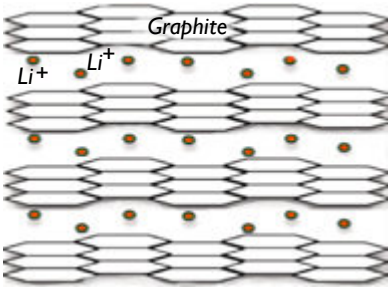
Faradion

In October 2024, India's Reliance Industries announced that its subsidiary Reliance New Energy Limited, had completed acquisition of the remaining 8% equity share in U.K. company Faradion Limited. Reliance now has full ownership of Faradion and plans to utilize Faradion's sodium-ion battery technology in a gigafactory in Jamnagar, Gujarat, India. Operation should commence in the second half of 2026, with a concentration on battery energy storage systems (BESS) for utility, commercial, industrial, and residential markets.

Altris Energy

Altris is a Swedish company spun off by Uppsala University professors in 2017. Their sodium-ion battery is based on a cathode made from **Prussian White**, named Fennac, along with a **hard carbon** anode.

The traditional graphite anode used in lithium-ion batteries is *not* suitable for sodium-ion batteries as the larger sodium ions (Na^+ ionic radius 0.95 nanometers) cannot slide between planes of the graphite lattice as easily as the smaller lithium ions (Li^+, ionic radius 0.60 nm). One of the alternative cathode materials used is hard carbon, obtained by pyrolysis of biomass.



Lithium ions, Li^+, intercalated between layers of a graphite anode.

In June 2024, Altris announced a partnership with Stora Enso to use that company's Lignode® hard carbon material, derived from lignin, a by-product of wood pulp manufacture.

Altris 25 Ah and 140 Ah sodium-ion pouch batteries. [Credit: Altris]

Another partnership with Clarios LLC of Glendale WI will develop low voltage batteries for the automobile industry.

Altris has received funding from the Swedish Energy Agency, Maersk Growth, Clarios LLC and Volvo Cars for further development of its sodium ion technology in electrical grid storage, vehicle and marine applications. The financing will be used to finalize Altris' pilot production facility.

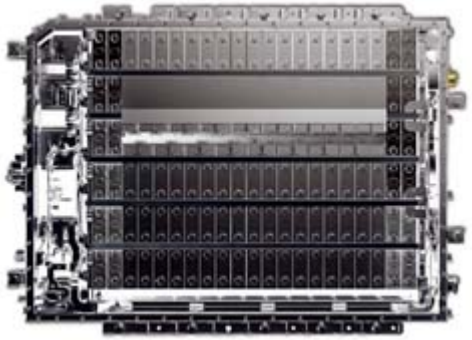
Contemporary Amperex Technolgy

Contemporary Amperex Technology Co. Limited (**CATL**) has continued development of sodium-ion batteries alongside its worldwide business in lithium-ion batteries.

In July 2021 CATL unveiled a sodium-ion battery for electric vehicles. CATL's first generation of sodium-ion technology was similar to Altris' design, with a modified **Prussian white** cathode and **hard carbon** anode. Energy density of up to 160 Wh/kg was claimed, approaching similar lithium iron phosphate batteries. The battery could charge to 80% capacity in 15 minutes at room temperature and retain 90% of its charge at –20°C.

These first-generation sodium-ion batteries were incorporated in some tiny four-wheel electric vehicles, but sales volume has been small up to 2024.

In October 2024 CATL announced its "Freevoy" super-hybrid vehicle battery incorporating *both* lithium-ion technology for extended


CATL 'Freevoy' vehicle battery for plug-in hybrids and extended-range electric vehicles combines lithium-ion and sodium-ion technology. [Credit: CATL]

range *and* sodium-ion technology for low-temperature capabilities down to –40°C. CATL claimed over 280 kilometers of range after just 10 minutes of charging.

In April 2025 CATL announced a second-generation "Naxtra" range of sodium-ion batteries. The Naxtra **electric vehicle** battery will perform across a temperature range from –40°C to +70°C, and have an energy density of 175 Wh/kg, comparable to the 185 Wh/kg of lithium iron phosphate. This should allow a 310 mile vehicle range on a single charge. Combustion-supporting materials are eliminated by use of a proprietary, electrolyte that forms a passive insulation layer with dendrite blocking technology. The electrolyte effectively provides a firewall to prevent thermal runaway. (A CATL patent describes a sodium cell electrolyte containing fluoroether diluent, flame retardant and ionic liquid.) Mass production of electric vehicle batteries at a new facility in Fujian Province should begin in December 2025.

'Naxtra' electric vehicle battery based on sodium-ion technology. [Credit: CATL]

As well as the Naxtra passenger electric vehicle battery, there is a Naxtra 24V heavy-duty truck integrated **start-stop** battery based on sodium-ion technology. A start-stop battery is designed for vehicles which turn the engine off automatically whenever the vehicle is stationary to save fuel and reduce emissions. These batteries are built to handle the demands of frequent engine restarts and provide power to electrical systems while the engine is off. The Naxtra 24V battery offers more than 8 years of service life, deep discharge capability, one-press starting at –40°C, and the ability to start a vehicle after being left idle for a year. Total life-cycle cost should be ~60% less than a traditional lead-acid battery.

'Naxtra' 24 volt heavy-duty truck start-stop battery employs sodium-ion technology. [Credit: CATL].

One thorn in CATL's side is a determination by the U.S. Department of Defense in January 2025 claiming that CATL works with China's military, querying deals by Ford Motor and Tesla to license CATL technology. Meanwhile CATL is pursuing an IPO on the Hong Kong Exchange, partly to finance a new $7.6 billion plant in Hungary. In April 2025 the House Select Committee on China sent a letter to JPMorgan Chase and Bank of America demanding the banks withdraw from their role in CATL's upcoming Hong Kong IPO.

Yadea

Yadea Group is a Chinese manufacturer of electric bicycles, scooters and motorcycles. In January 2025, Yadea announced a new line of two-wheel electric scooters powered by a sodium-ion battery. The low-cost battery manufactured by Yadea's Huayu subsidiary results in a scooter costing only $450 - $660. The battery can be charged to 80% of capacity in just 15 minutes, is fire- and explosion-proof, achieves an energy density of 145 Wh/kg, and retains 92% of discharge capacity at –20°C, making it ideal for use in colder regions. The battery can be swapped out for a fully-charged unit in 30 seconds.

Huayu sodium-ion battery used in Yadea's low-cost electric scooters, can be recharged in 15 minutes or exchanged for a fully recharged battery in 30 seconds. [Credit: Yadea.]

Two-wheel moped and motorcycle vehicles are popular in Asian countries where they tend to be used for shorter, slower trips than four-wheel automobiles. While lithium-ion batteries for two-wheelers have gained a bad reputation for thermal runaway and catching fire while being recharged, sodium-ion provides a lower-cost, safer alternative for the two-wheel portion of the electric vehicle market.

Elecom

In March 2025, Japanese manufacturer Elecom introduced a new power-bank based on sodium-ion technology. The power bank contains

Elecom sodium-ion power bank is available in black or gray. [Credit: Elecom]

three sodium-ion cells and provides one USB-C port and one USB-A port for recharging of external devices such as a smartphone or camera. Capacity is 9 Ah.

At present, the Elecom DE-C55L-9000 is *more* expensive and heavier than similar-rated lithium-ion power banks, so the company is promoting low-temperature operation down to –34°C (–30°F), longer cycle life (5000 charge cycles) and improved safety.

Checked baggage ban

Worth noting: the USA's Transportation Safety Agency (TSA) has **banned** power banks and cell phone battery charging cases that contain a lithium-ion battery from checked bags because of the fire danger. These items must now be packed in a carry-on bag.

Conclusion

Sodium-ion batteries are enjoying some popularity for:

- stationary energy storage, such as uninterruptible power supplies and demand-smoothing for renewable energy,

490 kW Tesla Powerpack battery energy storage system in use at Staples Plaza, Yorktown Heights uses lithium-ion cells to store energy from the rooftop solar array. Sodium-ion could provide a safer technology for future static installations.

- two-wheel electric vehicles such as e-bikes, scooters and mopeds used for short trips,
- local delivery vans,
- other applications where low-flammability, low-temperature performance and repeated discharge/recharge are important.

Economies of scale have not yet reduced the price of sodium-ion batteries below lithium-ion. It remains to be seen whether CATL's new design announced in 2025 will be widely accepted for four-wheel electric vehicles, and whether they will have the practical range and performance to compete with lithium-ion.

Application of sodium-ion technology to stationary energy storage may eventually bring about lower-cost alternatives to the Bioenno-type 12V lithium iron phosphate batteries used in amateur radio and other hobbyist use.

- NM9J

New antenna analyzer

In *PCARA Update* for October 2018, pages 7-10 there was a review of the German *FunkAmateur* magazine's FA-VA5 Vector Antenna Analyzer kit. This unit incorporated a lot of technology in a small metal box, allowing single port measurement of antennas and other devices over the frequency range 10 kHz to 600 MHz, with a computer connection available for control and graph plotting. The FA-VA5 operated standalone from two internal AA batteries.

Back in 2018, I ordered the kit from *FunkAmateur* magazine's web store, http://www.box73.com, for $189.00. When the kit arrived, it contained a circuit board with all surface mount devices already soldered on. Installation of the remaining parts was moderately difficult, requiring a small pencil-tipped soldering iron and a larger 100 watt soldering iron. After trouble-shooting the installation, I mounted the circuit board inside the supplied metal case, carried out a SOL (short/open/load) calibration then tried out the antenna analyzer on various antennas around the shack.

FunkAmateur FA-VA5 Vector Antenna Analyzer from 2018.

The FA-VA5 turned out to be a valuable piece of test-equipment for checking out all sorts of antennas —

- my own HF antennas
- antennas being prepared for contests by Joe WA2MCR
- antenna workshop tape-measure Yagis for foxhunts
- HF antennas used at PCARA events
- VHF/UHF antennas

One of the more useful modes of the FA-VA5 displays VSWR on five bands simultaneously (160m, 80m, 40m, 20m, 10 meters), just the thing for multiband an-

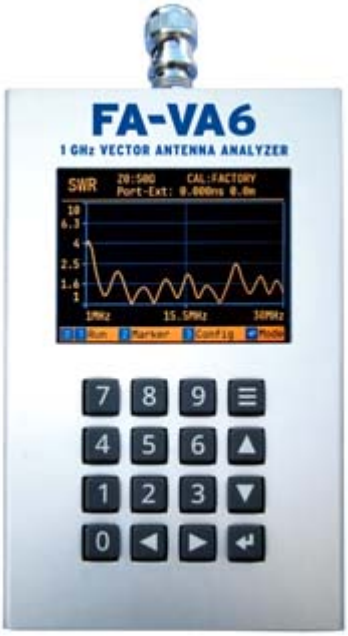
tennas used at Field Day. The FA-VA5 is more compact than my old MFJ-259 antenna analyzer, does not require the MFJ's eight AA cells for internal power and covers a wider frequency range than the MFJ-259. The only downside was the extremely sparse user interface — consisting of one ON/OFF slide switch and just three press-buttons.

NM9J checks the SWR of Field Day 2025 antennas on multiple bands using the FA-VA5 Vector Antenna Analyzer while Rob AD2CT looks on.

FunkAmateur stopped production of the FA-VA5 kit in 2024. Designer Michael DG5MK explained that the decision was brought about by post-pandemic price increases and component shortages. Michael DG5MK asked for feedback on *groups.io* and received a number of suggestions for an improved FA-VA5.

The FunkAmateur web shop, at https://www.box73.de/ has now announced that an **FA-VA6** kit will be available from July 14, 2025. There will be several improvements over the FA-VA5, as follows:

- Display: 320 x 240 pixels, 2.8 inch, IPS TFT color
- Power supply: internal 3.7 V 18650 Li-ion cell, 3180 mAh
- Frequency coverage: 0.01 – 1000 MHz
- External connection: USB-C for charging the Li-ion cell, for remote control via DG8SAQ software and for firmware updates
- Keyboard: 4×4 silicone rubber keys
- Short/Open/Load BNC kit



FunkAmateur FA-VA6 Vector Antenna Analyzer kit.
[Credit: FunkAmateur]

The new design retains the BNC connector and anodized aluminum case. Instructions will be provided in German and English. Because of hazardous goods legislation, purchasers outside Germany will need to order the battery-free kit and supply their own 18650 lithium cell.

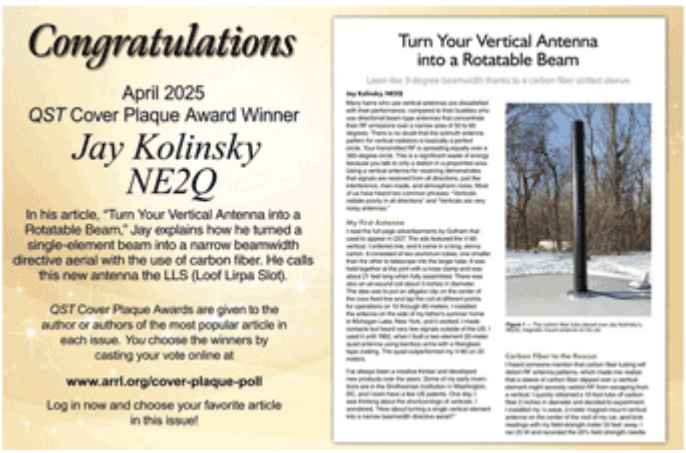
Price on the Funkamateur web store is shown as 299 Euros, around $350 dollars at present exchange rates. It may be worth checking U.K. supplier SDR-Kits (https://www.sdr-kits.net/) as they have handled the previous FA-VA5 kit in the past.

- NM9J

Congratulations Jay

As mentioned in *PCARA Update* for April 2025, PCARA member Jay NE2Q had an article published in April *QST*: "Turn Your Vertical Antena into a Rotatable Beam". In the May 2025 *PCARA Update*, Jay provided some of the email messages he had received, seeking further information about his astonishing design, which incorporated a slit carbon-fiber tube, which he named the "Loof Lirpa Slot".

Congratulations are now due to Jay NE2Q as his article was voted "QST Cover Plaque Award Winner" for April 2025. (See *QST*, July 2025, page 95.)



QST Cover Plaque Awards are given to the author or authors of the most popular item in each month's magazine. ARRL members can vote on articles in the current issue of QST by visiting: https://www.arrl.org/cover-plaque-poll

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

PCARA membership meetings are on summer break during July and August
Sat July 19: PCARA Breakfast, 9:00 a.m., Uncle Giuseppe's, 327 Downing Dr. Yorktown Heights, NY.
Sat Aug 16: PCARA Breakfast, 9:00 a.m., Uncle Giuseppe's, 327 Downing Dr. Yorktown Heights, NY.

Hamfests

Check with organizers before leaving.
Sun Jul 13: Sussex County ARC **Hamfest** and ARRL **Hudson Division Convention**, Sussex County Fairgrounds. 37 Plains Rd, Augusta NJ. 8:00 a.m.
Sat Jul 26: New Jersey Antique Radio Club Hamfest, InFoAge Science and Museums, 2201 Marconi Rd, Wall Township, NJ. 8:00 a.m.
Aug 21 - 24: Northeast HamXposition, ARRL New England Division Convention, Marlborough, MA.

VE Test Sessions

Check with the contact before leaving.
Jul 10, Aug 14: WECA, Westch Cnty Fire Trg Center, 4 Dana Rd, Rm 3 Valhalla NY. 7:00 p.m. Contact VE, rcasino48'at'gmail.com
Jul 18, Aug 15: Orange County ARC, Munger Cottage, 40 Munger Dr., Cornwall NY. 6:00 p.m. Contact VE joed99'at'verizon.net.
August: PCARA. Check Google Groups e-mail and PCARA web sites for a possible VE Test Session in August 2025.

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