



PCARA Update



Volume 22, Issue 7 Peekskill/Cortlandt Amateur Radio Association Inc. July 2021

Out of the woods

We had our first official club activity for June on Saturday the 12th, with the **PCARA Breakfast** at Downing Park in Yorktown Heights, NY. We had about a dozen attendees and it felt awesome not having to wear a mask. The park was somewhat crowded due to a baseball event taking place. Mike N2HTT brought along a hotspot for a DMR demonstration. Just a reminder, the club has two DMR UHF repeaters ready to be pressed into service should the membership wish.

Later at 1:00 p.m. on June 12, 2021, PCARA participated in the Hudson Valley Digital Network's **Hudson River Radio Relay** as Special Event Station N2N, from the Hudson Highlands State Park at Annsville Circle. We had a total of 15 members come out and participate making a total of 72 HF contacts! PCARA won the *Squeaky-Clean Award* for very complete logs as to name, call sign, and grid square. Full details can be found in this month's edition of the *PCARA Update*. Thanks for everyone who came out to help make this the success that it was. Looks like this is going to become an annual event. Stay tuned.



On June 12th PCARA operated Special Event station N2N from the gazebo at Annsville Creek Paddlesport Center.

The June PCARA **Membership Meeting** was combined with a **Field Day Planning Session** on June 23, 2021 at 7:00 p.m. at the baseball field behind Walter Panas High School. We had an excellent turnout with over a dozen attendees — which included a few new faces! The usual items were discussed and there were no problems or issues.



Field Day antennas included a tri-band beam mounted on the tower-trailer and a 6 meter beam (right).

ARRL **Field Day 2021** Saturday June 26th started with a 9:00 a.m. gathering at the home QTH of Joe WA2MCR. A rental van was loaded with the necessary equipment and proceeded to Walter Panas High School at 300 Croton Avenue in Cortlandt Manor, NY. At the school we were greeted with a small army of members ready to work. This year we had a couple of new things to play with. First, we had the antenna tower / trailer on which we would mount a tri-band beam antenna (10, 15, and 20 meters). The trailer was transported courtesy of Lou KD2ITZ and raised without incident. Second, we had to string up a 40-meter 3 element inverted-V dipole beam designed and built by Jay NE2Q. This would turn out to be our ace in the hole (953 contacts)! We also had a beam for 6 meters using a mast supplied by Mike W2IG. After a bit of a wrinkle raising the antenna (Oops!), we *literally* got things



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straightened out. A full account of PCARA ARRL Field Day 2021 can be found in this month's issue of the *PCARA Update*. A very big **thank you** to the 25 PCARA members that helped make ARRL Field Day 2021 such a success!



Lou KD2ITZ and David KD2EVI raise the telescopic tower for the first time during PCARA's Field Day activities at Walter Panas High School.

On Sunday June 26, 2021 PCARA held a **PCARA V.E. Test Session** at 10:00 a.m. There were two candidates in attendance, one of which earned his Technician license while the other upgraded to General. Congratulations! Thanks to Mike W2IG for coordinating the session. The next PCARA V.E. Test Session is on Saturday July 24, 2021 at the John C. Hart Memorial Library in Shrub Oak, NY.

The next **PCARA Breakfast** is scheduled for Saturday July 24, 2021 at 9:00 a.m. at the Downing Park Pavilion in Yorktown Heights, NY. Come along and share your Summer adventures!

Just a reminder that there are no PCARA Membership Meetings for July and August but the PCARA Breakfasts will continue. The date for the September PCARA Membership Meeting will be posted on the PCARA website.

Here are some upcoming Hamfests in our region to keep busy:

- Sun July 10: Raritan Valley RC W2QW Hamfest, Piscataway NJ.
- Sun July 18: Sussex County ARC Hamfest, Augusta, NJ.
- Sat Aug 21: East Greenbush ARA Hamfest, East Greenbush, NY.
- Sun Aug 29: Candlewood ARA Western CT Hamfest, Newtown CT.
- Sun Sept 12: Orange County ARC Hamfest, Scotchtown, NY.
- Sun Oct 17: Wayne RA Emergency Team (WRAET) Hamfest, Wayne NJ.

The weekly Roundtable and Old Goats Nets continue at 8:00 p.m. on Tuesday and Thursday nights respectively. Check the PCARA website and Google

Groups e-mail for any news and updates.

Stay safe and enjoy the Summer! I look forward to seeing you at the PCARA Breakfasts or at our September PCARA Membership Meeting.

- 73 de Greg, KB2CQE

PCARA Board

President:

Greg Appleyard, KB2CQE; kb2cq@arrl.net

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Director:

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.

Adventures in DXing

- N2KZ

It's On the Microwaves

What is the highest frequency you have ever operated on? Most amateurs would probably say 70 centimeters — the popular 420 to 450 MHz band known for repeater operation and much more. Did you ever consider where all of your computer and convenience devices might take you?

Chances are you have transmitters in your house or in your hand that use frequencies more than ten times that high! I would bet that more transmitting occurs on microwaves than anywhere else! Really? Welcome to the world of WLAN — Wi-Fi channels. The two most popular bands sit at 2.4 GHz and 5 GHz and they are just jammed with users. You may have a dozen or more transmitters on these bands in your house already!

Certainly, all your computer and accessory devices live here: PCs, iPads, printers, scanners, wireless mice and other peripherals use them. Add to the roster wireless speakers, Roku boxes, televisions, flat screens, remote controls, exercise bikes, cordless phones, car stereos and many, many more. Everything that uses Bluetooth is jammed into the 2.4 GHz band! How do they all co-exist?

Microwave frequencies behave very much like visual light. Your device's WLAN transceiver produces a signal that travels just like a household reading lamp. Its light can easily fill a room. Microwaves in the gigahertz range can even penetrate walls and go a wee bit farther than visual light but not too much more. Where it goes beyond that is often very hard to predict.

In a professional setting, designing microwave wireless communication becomes quite an art. Sophisticated diagnostic software can create precision 'heat maps' that predict just how far one hub can cover. Using the software, you can change the position and height of the installation around your building to discover the optimum placement. Don't take anything for granted! On-site experimentation is always necessary. The best spot might not be logical at all!

Also, if you are blessed with detailed software, remember to use device **MAC addresses** for positive identification of all the client devices you may have to serve. Device diagnostics are often included with the support application provided with your Internet service. For example, Altice/Optimum's network map can be found at: <https://www.optimum.net/internet/manage-router>. Log-on to your Optimum account and tab 'Internet' and then 'Router' to reach 'My Network Dashboard.' For those who have older Windows computers, try NetStumbler*: <http://www.netstumbler.com/downloads/>.

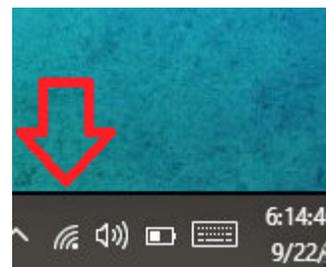


You may be completely amazed at how many things in your home require wireless connection!

[*A more modern alternative to Netstumbler is **Vistumbler**, which works with Vista to Windows 10. See: <https://www.vistumbler.net/> - Ed.]

Finding a Good Spot

For mere mortals like ourselves, common computer operating systems provide basic wireless signal strength meters for our use. In *Windows*, go to the lower right corner of your desktop and right click the icon that looks like a **stairstep**. Left click 'Open Network and Sharing Center.' Under 'View your active networks,' click 'Wireless Network Connection' in blue-type to open the diagnostic screen. There's your real-time stairstep meter!



Windows 10 Wi-Fi icon looks like a stairstep. Left-click for a list of available networks.

On a Mac, hold down your 'option' key and click the wireless icon in the upper left corner of your desktop. Click 'Open Wireless Diagnostics' and then just leave this box open. Go to the top of the left side of the desktop and click 'Window' then 'Performance' to see a nifty real-time metering of your carrier to noise level and wireless LAN throughput. It is worth the effort!

NetSpot

The free Wi-Fi diagnostic software *du jour* is a suite of applications from NetSpot for Windows and Mac. You can download an introductory version for free at: <https://www.netspotapp.com/netspotpro.html>.

You will see three boxes with different levels of subscriptions. Scroll down a little bit and you will find the tab for the free version. Take a look!

Download the basic version and you'll have an easy-to-use signal strength spreadsheet and the ability to build your own 'heatmap' diagnosis of Wi-Fi coverage throughout your house and surrounds. A very useful tool is NetSpot's deep sensitivity to outlying wireless devices from people living around you. Examine the signal spreadsheet and note what channel everyone else is using for their connectivity. You can then select channels avoiding others to maximize your coverage and use!

Antenna Orientation

What follows might remind you of a time long ago when you installed TV antennas. Remember that? Install your wireless hub/router in a place high and away from metal objects central to where you use your computer and other devices. Avoid all metal objects:

plumbing pipes, AC power runs, metal doors, appliances and large flat-screens, garage doors. Think creatively! Walk around with your laptop and monitor your wireless signal strength. Don't forget to try your upstairs, basement areas, outdoor porches or decks and such if you have them. Do you have coverage?

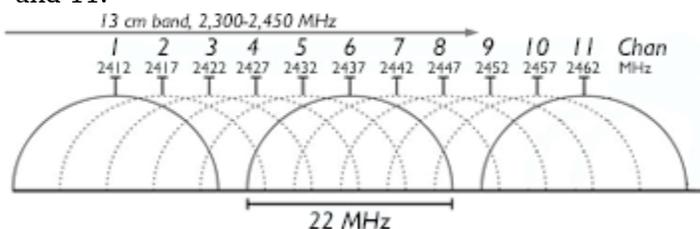
If not, try another spot. I like to use a good long Cat 5 cable and a feed-through to extend the position of the wireless hub to other far-off places for trial. See if you can find a happier place for your hub. Important: Keep in mind that Cat 5 extensions using handy feed-through couplers work in a pinch but often decrease your overall throughput. A straight shot of Cat 5 or Cat 6* cable from your Internet provider's demarcation hardware to your wireless hub is nearly mandatory for permanent installations.

[***Shielded** Cat 5 or Cat 6 cable is recommended for compatibility with any RF equipment including an amateur radio station. -Ed.]

For an interesting experiment, try this: Wait until it is good and dark outside. Turn out every light and light-creating device in your house. Put just one household lamp on adjacent to your wireless hub and walk around your house. How far can you see some light? Where does no light go? I will bet that your wireless hub coverage would be incredibly similar!

Band Characteristics

The 2.4 GHz and 5 GHz Wi-Fi bands are quite different in design and characteristics. The 2.4 GHz band was originally designed for slower speed bandwidths. There are eleven original channels in this band created when 5 MHz was enough space to do business. To increase throughput speed, the channels have been condensed to three 20 MHz channels - numbered 1, 6 and 11.



The eleven overlapping Wireless-G channels have been condensed to three channels: 1, 6 and 11. Note overlap with the 13 cm amateur band 2300-2310, 2390-2450 MHz.

To keep operations tidy, most communication is done on channels 1 and 11 only. Adding to the melee, household transmission on wireless microwave bands often operate in the milliwatt range. 5 GHz transmissions sometimes use as little as 25 milliwatts or less. Needless to say, their signals can be fragile and very prone to interference. The incessant disruption created by switching power supplies, flat screen TVs and anything with a computer CPU aboard may reduce or kill Wi-Fi signals easily*. Just a couple of inches, one way

or another, may make or break your wireless circuit. Choose and position carefully!

[* Not to mention microwave ovens with their free-running cavity magnetrons on or about 2.45 GHz. – Ed.]

Avoid these signal killers: Plaster wall with steel lath and brick walls attenuate microwave signals very well! Seemingly innocent energy-efficient windows may be loaded with lead content and are also signal killers. I discovered this 20 years ago when first experimenting with satellite radio. Sirius and XM uses 2.3 GHz and their signals will not penetrate my windows. Move the pick-up antenna to aim through my wood-frame walls and the signal comes right in! Amazing and illogical!

Similarly, the 5 GHz band can be sliced and diced to provide expanded throughput. Original channel spacing was 20 MHz wide. Combine three channels and you'll enjoy a 40 MHz channel with guard bands. Combine seven channels and you'll have 80 MHz with guard bands. Use 15 channels and you are now at 150 MHz wide. Put on your seatbelts for ultra-speed!

It's your choice... You can operate on 2.4 GHz and have a solid but slower connection — or — operate on 5 GHz and enjoy more bandwidth and speed but your connection may not be as reliable.

For a detailed description of wireless channels see: https://en.wikipedia.org/wiki/List_of_WLAN_channels.

Let's put the future into perspective. The new 5G wireless phone technologies operate way, way up between 28 and 39 GHz. There are wide, wide swaths of bandwidth up there but the signals really are just like visual light. 5G coverage areas are blindingly fast but incredibly local nearly within line-of-sight. The higher you go in frequency, the faster you can go in throughput — but — your signals will become fragile very, very easily. If you can't see the hub, you won't be able to resolve it... but if you do... it's a lot of fun!

Remember the Demo?

Back in January 2019 at the Cortlandt Community Room, I demonstrated transmission of standard televi-

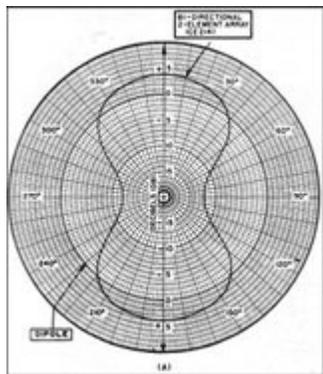


Karl N2KZ demonstrates UHF antennas and techniques at PCARA's UHF workshop in January 2019.

sion signals on the lowly 70cm band around 440 MHz. You would have seen how I bounced signals around the room aiming my transmission antenna in the oddest places to resolve nice pictures. Imagine how *more* unpredictable it can get when you when you go up and up and up in frequency!



N2KZ-television was “on the air” on 70 cm from Cortlandt Town Center’s Community Room.



Horizontal pattern of a bi-directional 2-element antenna.

The two or four little whip antennas still included on some router hubs can be incredibly useful tools. Try your own custom signal patterns for wireless Internet transmission. Adjusting these little antennas may provide just enough carrier to noise improvement to get your wireless signal into a difficult place! Again, patient experiments could make a big difference. Remember to get out of the way after each antenna move! Your body can reflect and distort microwave signals too!



Linksys 7dBi gain antennas for Wi-Fi. Adjust the orientation to modify coverage.

Amateur Radio Wireless

Before you go, remember that when you are using the 2.4 GHz band for your wireless devices *you actually are on an amateur radio band!* North America’s 2.4 GHz wireless spectrum spans from 2401 to 2473 MHz. America’s 2.4 GHz amateur radio band runs from 2390 to 2450 MHz. [See diagram on page 4 -Ed.]

2.4 GHz is a *very* shared piece of spectrum! See? Your highest band of operation has been 2.4 GHz all along! Every day you are a microwave milliwatter!

See you on the microwaves, amigo! Enjoy your summer and I’ll see you on the air!

73s and dit dit de N2KZ ‘The Old Goat.’



Special Event Station N2N

Hudson River Radio Relay

The N2N story begins in February 2021 when Karl N2KZ was approached by Mark WA2NYY of the **Hudson Valley Digital Network** to ask whether PCARA would like to join other Hudson Valley Radio Clubs in a Special Event being organized for June 12, 2021 by Steve K2GOG.



There would be radio stations operating on multiple bands and modes from Bannerman's Island and various Hudson River locations to build awareness of this part of the Hudson Valley. Stations would be using a sequence of 1 × 1 Special Event call signs from 1:00 p.m. to 5:00 p.m. Eastern.

Nowhere to nestle?

Karl checked with the PCARA Board and received a positive reaction. One suggested location was at Peekskill's Riverfront Green — the same location where in August 2015 PCARA had organized a Special Event Station to celebrate the Hudson Valley Exposition using call sign W2H. Unfortunately the City of Peekskill required a \$100 deposit and \$150 fee for use of the park... that's a lot for a 501(c)(3) non-profit to pay for a four hour Special Event.

The hunt was on for a less expensive site. Suggestions included Croton Point Park, George's Island and Iona Island. The first two are Westchester County Parks with a \$200 fee, while Iona Island had already been chosen by another group. Your editor paid a visit to Peekskill's "Annsville Preserve Park" on the south side of Annsville Creek. Access to this site is down a narrow, unpaved road alongside the Metro North tracks that is only wide enough for one vehicle.

Near to nirvana

A further suggestion from Steve K2GOG provided a better prospect. The Annsville Creek Section of the Hudson Highlands State Park Preserve lies in the Town of Cortlandt on the opposite side of the Creek from Peekskill's Park. The site is close to Annsville Circle, with a small parking lot and access from Rt. 6 / Rt. 202 — the Goat Trail. The Paddlesport Center offers a launch point for visitor's boats, while kayak and paddle-



Annsville Creek Paddlesport Center is just off the Goat Trail.

board rentals are available from Hudson River Expeditions. Karl N2KZ made contact with New York State Parks through Jon, KC2BNW and obtained permission to operate from the Annsville Paddlesport site on June 12th. Meanwhile Karl and David KD2EVI had been attending Zoom planning sessions organized by Steve K2GOG. Full details of the eight stations involved were published on the Hudson River Radio Relay web site at: <https://hudsonriverradiorelay.com/for-radio-amateurs.html>.

Not too nippy

For several days before the event, Joe WA2MCR had been configuring radio equipment for computer logging, CW and digital modes. Saturday June 12th began at 9:00 a.m. with PCARA Breakfast at Downing Park Pavilion. The early morning temperature was only 62°F with an overcast sky. After breakfast, David KD2EVI and Joe WA2MCR traveled to Joe's location to load table, chairs and shelter onto David's truck. We continued to the Annsville Creek Paddlesport Center where Karl N2KZ had been keeping an eye on park occupancy. Fortunately gray skies and occasional spots of rain had kept many visitors away and there was space in the parking lot. Weather stayed overcast with temperatures in the range 65-66°F for the rest of the day.

Joe made a decision to employ the park's gazebo to house PCARA's special event station. The gazebo is positioned midway between two medium size trees in front of the Paddlesport building.



The gazebo is located between the Paddlesport building and the kayak launch point on the waterfront.

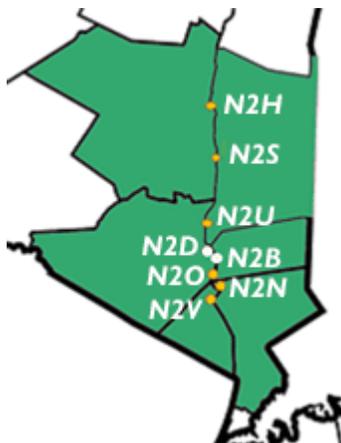
Joe used his fishing pole to launch lines across each tree, then we pulled up larger ropes to support the G5RV antenna previously used on PCARA Field Days. David KD2EVI had brought his Homelite® 1700W inverter generator which provided 120V AC power throughout the afternoon. With Joe's Icom IC-7410 HF transceiver plugged in it was time to check the antenna. VSWR on 20 meters and 40 meters was a little too high for the transceiver's internal tuner so Joe added his external MFJ Intellituner and the coaxial cable feed was extended from 20 to 50 feet.



The setup crew for Special Event Station N2N. Left to right Mike N2HTT, Joe WA2MCR, Greg KB2CQE, Karl N2KZ and David KD2EVI.

Next to nuclear

After a short contact with Mike N2EAB to confirm that all was working well, operations commenced with Karl N2KZ on 20 meter CW. Subsequent contacts were



on either 20 meters or 40 meters SSB. According to the band plan from Hudson River Radio Relay, PCARA's station N2N was intended to take a frequency at the bottom of the range 7200 – 7250 or 14250 – 14280 kHz. Moving up-river from Annsville, the other stations, N2O, N2S, N2D, N2U and N2H would be spread progressively across the frequency range... spelling out H U D S O N from

north to south. Meanwhile N2B would be midway, sited on Bannerman's Island.



Karl N2KZ operates CW while Mike N2HTT logs at N2N. Indian Point Energy Center domes just visible, top right.

After setup was complete, a number of PCARA club members visited the Annsville site, taking part in operating the station and logging contacts. The computer logging software specified by Hudson River Radio Relay was N3FJP's Amateur Contact Log. The suite is already familiar to PCARA members from Scott N3FJP's Field Day logging software. The standard exchange was to be operator name and grid square, something of a novelty for a minority of the HF stations worked.



Vincent KD2VAV makes a phone contact while David K2WPM logs. KC2WGX, KD2SKY and KD2ITZ looking on.

No to net

Early in the afternoon there was an interruption to the computer logging system when the Lenovo notebook decided to restart in order to install a Windows 10 update. This was despite the computer being disconnected from the Internet for several days! Strangely enough, the same thing had happened during Field Day 2018! Joe reverted to paper logging while the computer was rebooting, then caught up with the electronic log after the computer had successfully restarted.

North to northwest

Examination of the log reveals that while initial 40 meter contacts were close-in, coverage reached out northwest to western New York and Toronto plus southwest to Virginia. 20 meter contacts stretched further, ranging from Wisconsin, Minnesota and Illinois in the northwest around through Missouri, Kentucky and Tennessee in the west, down to Louisiana, Mississippi, Alabama, Geor-



Distribution of contacts made by Special Event Station N2N on June 12. [Mapping by <https://www.qsomap.org/>]



Location of N2N by Peekskill Bay gave a good take-off from NW to SW with other directions shielded by high ground.

gia and Florida to the southwest.

This coverage reflects the location of N2N at the Peekskill Bay “bend in the river”, with a clear take-off across the River Hudson to the north-west, west and

southwest, while shielded for 270° from behind by close-in high ground to the north, east and south.

Nice to neighbors

During the afternoon HF propagation was fairly good, though marked by deep, rapid fades.

Throughout N2N operations the atmospheric sounds of HF radio were augmented by a **songbird** tweeting out his multi-tone comments from the branches of a nearby tree. Can anyone identify the species?



Nowhere to nest.

We were in a good position to observe comings and goings as numerous canoeists made their way down to the launch point then paddled off across Annsville Creek and into the river beyond the Metro North tracks. Despite our prominent signage, none of the water-sport enthusiasts paid a visit to see what was happening at the nearby gazebo which housed N2N and PCARA.



Canoeists and Kayakers made use of the Paddlesport Center’s launch point throughout the afternoon.

Here is a list of the neighboring groups who took part in the Hudson River Radio Relay including their

call signs and locations along the river.

Call	Group	Location
N2V	Crystal Radio Club	Kennedy Dells Cnty Park
N2N	PCARA	Annsville Creek
N2O	Orange County ARC	Bear Mountain State Pk
N2S	QSY Soc/Mt Beacon ARC	College Hill Pk, Poughkee
N2D	USMA Cadet ARC	Constitution Island
N2U	PEARL	Castle Rock Unique Area
N2H	Overlook Mtn ARC	Kingston Point Park
N2B	Hudson Valley Digital Netw	Bannerman’s Island

Nothing to note?

Total contacts from PCARA’s Special Event Station N2N numbered **72**, with 20 QSOs on 7 MHz and 52 on 14 MHz. Anyone who made a contact can apply for a commemorative certificate by uploading their ADIF log file via the web page: <https://hvdn.org/hr3logs2021>.

Tear-down did not take long and we were leaving the site by 5:30 p.m. Our last visitor of the day was **Jon, KC2BNW** who was making a late afternoon round of the NY Hudson Highlands State Park Preserve properties.



Thanks to all the members who came along for set-up, operation and tear-down including: – Karl N2KZ, Joe WA2MCR, David KD2EVI, Mike N2HTT, Bob N2CBH, Greg KB2CQE, Masa JR1AQN, Lou KD2ITZ, Vincent KD2VAV, David K2WPM, Jay NE2Q, David K2WPM, Nic KD2SKY and Bruce KC2WGX.

Thanks also to the Hudson Valley Digital Network for organizing the activity. We hear there may be another Hudson River Radio Relay in 2022. Meanwhile, you can read more about activity at the other stations on the following Internet site: <https://hvdnnotebook.blogspot.com/>

- NM9J

Field Day 2021

Per ardua ad alta

(Through adversity to the heavens)

PCARA has used the grounds of Walter Panas High School for ARRL Field Day from 2007 to 2019. In 2020 members were forced to operate from home by COVID restrictions, but in 2021 PCARA was back at Walter Panas High School.

Perhaps we were rusty after a two year gap, but plenty of **adversity** was encountered this time. PCARA's persistence prevailed and despite problems we were able to send strong signals into the **heavens**.

Preparation

There was concern that the Upper Baseball Field at Walter Panas High School might have been converted to a parking lot, but when Joe WA2MCR requested permission from Lakeland Central School District he was assured that the field should be intact and available for June 26-27. No baseball games were scheduled — as confirmed by the web site of the Greater Hudson Valley Baseball League.



Baseball field at Walter Panas High School in early June.

Lou KD2EVI and Greg KB2CQE had registered the trailer tower donated by WECA. David KD2EVI assisted with last minute trailer maintenance. Joe WA2MCR cleaned and assembled his Hy-Gain TH3Jr tri-band beam in the yard, found a bad trap and replaced it.

Jay NE2Q revised his design for the three element sloping wire beam that was successfully used in 2019 and came up with a wide-spaced antenna with three inverted-V elements suspended at their centers.

Three days before Field Day, PCARA's monthly meeting took place at Walter Panas High School, allowing inspection of the upper baseball field and the outdoor table area where Field Day catering and a V.E. Test Session were planned. On Friday June 25, Joe collected the U-Haul® rental van from Cortlandt Town Center.



Start of the day

Saturday morning June 26 began with an overcast sky and a temperature of 69°F. The forecast suggested isolated showers in the afternoon. By 9:00 a.m. David KD2EVI and Greg KB2CQE had arrived at Joe WA2MCR's location to move equipment into the rental van, then Joe drove to Walter Panas High School.

At the Field Day site we found some pluses and minuses. The "Got To Go" portable restroom at the baseball field had got up and gone. Fortunately there were three more available at the lower athletic field. Gates around the field were not locked, allowing the trailer tower to be towed onto the field by Lou's truck. Once in place, Joe positioned the rental van close to the tower.



The trailer with two-section tilt-over tower arrives on-site.

The plan called for lines to be launched over light poles early in the day, before breezes began. Unfortunately there was no launcher on-site — but this was rectified when David KD2EVI went home for his launcher and compressor. He was joined by Charles N2SO who brought his Alan Biocca CSV19 launcher, along with a recently acquired KR4LO Air Boss. Their efforts were augmented by Mike N2EAB who successfully launched the last group of lines.

Tower trial

Some problems had come to light during David KD2EVI's inspection of the tower trailer. One of the leveling jacks was frozen and there was no mechanical connection to hold the tower up.



Charles N2SO and David KD2EVI launch lightweight lines.

David had brought muffler clamps to lock the tower in place. The inner telescopic section would normally be raised to 40 feet using a wire winch.

Joe's Hy-Gain TH3Jr tri-band beam was assembled on the ground then mounted on the end of the horizontal tower. Coaxial cable was attached, then the tower was slowly elevated into the vertical position. Bearing in mind the shortcomings, the wind and need for guys, tower height was not increased, so the antenna height was only 20+ feet above ground.



Joe's renovated TH3Jr tri-band beam is attached to the mobile tower.

Rotation of the tri-band beam was accomplished from the tower base using the "Armstrong" method. Despite a lack of height, this antenna worked well on the 20 and 15 meter bands.

Six meter smash

Mike W2IG had brought along his ex-military 36 ft portable tripod antenna mast with 4 ft tubing sections. The team was raising Mike's 3-element Yagi with Yaesu rotator when a tubing section came loose and the antenna fell to the ground, bending and breaking elements.



The six meter Yagi has an unfortunate accident while being raised on Mike W2IG's tripod.

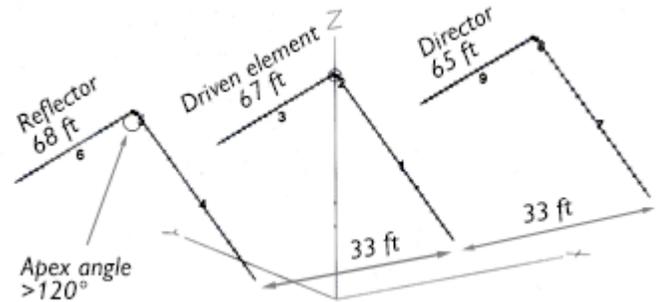
Despite this disaster Mike and Bob N2CBH were able to straighten the bent parts and re-drill bolt holes in the elements, making the antenna look almost like

new. It was raised to full height and performed well.

Joy for Jay and Joe

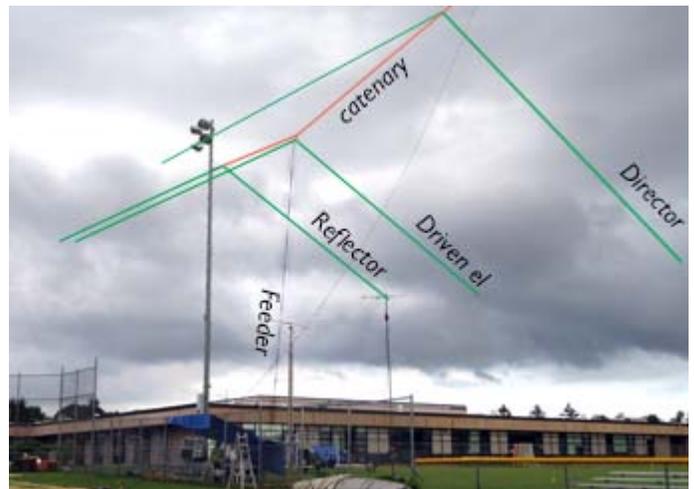
Following a suggestion from Lou KD2ITZ, Jay NE2Q had provided the design for a 40 meter wire beam antenna that was constructed by PCARA members at a workshop in April 2019. The sloping, two-element design was extended to three elements, with wires suspended between a catenary rope and stakes driven into the ground. This antenna performed well, see *PCARA Update July 2019*.

For 2021, Jay came up with an improved design. The three wire elements spaced one quarter wave apart would be supported at their centers on the catenary rope, in inverted-V fashion. Ends of the wires would be supported by cords sloping down to ground for an included angle greater than 120°.



EZNEC+ diagram of Jay NE2Q's redesigned three element wire beam with wide spacing and inverted-V elements.

Once lines were in place over the light poles, Jay was able to begin assembly and raising of the new antenna. This was a major team effort with PCARA members positioned under the catenary and at both ends of all three wire elements, maintaining tension and preparing to tie off the supporting ropes in light rain.



Jay's 40 meter beam antenna seen from below the director. Wire elements emphasized in green, catenary rope in red.

In order to reduce weight and maintain current balance, Jay's new design changed the coaxial cable feeder to 450 ohm ladder line. The intention was to attach the balanced line to a suitable antenna tuner then

run coaxial feeder from ATU to transceiver.

MFJ antenna tuners brought along by Joe and by Tom K2UQT both had “balanced line” outputs but they proved difficult to tune. Jay and Joe observed that the antenna/feeder combination already has a low impedance and this was being further transformed in the wrong direction by a small 4:1 balun inside the MFJ tuners which *require* a jumper for balanced line output.



Jay NE2Q prepares the 450 ohm ladder line feeder for connection to the 40 meter station.

Joe found a better solution was to employ the antenna tuner built into his Yaesu FT-1000MP, then connect the coaxial output *directly* to the 450 ohm ladder line. Despite the lack of balance, and early problems with a loose microphone connection, the new antenna proved to be a potent performer on 40 meters.

Station accommodations

The first HF station was set up inside the rental van, with Joe’s Icom IC-7410 transceiver connected to a choice of Hy-Gain TH3Jr beam for 10/15/20 meters or the G5RV antenna strung between light poles for use on 80 meters.

The other two stations were installed inside the baseball dugout, protected from the weather by one of Bob N2CBH’s tarpaulins. Stretching this tarp over the dugout proved difficult in the gusty wind, but eventually it was in place. Two tables were arranged back-to-back as there was insufficient cover to separate them.

One table housed the 40 meter station, with Joe’s FT-1000MP having a choice of 3-element wire beam or multi-element wire dipole for 40-to-10 meters. The second table was for the 6 meter station, using Mike W2IG’s Yaesu FT-857 connected to the repaired 3-element Yagi, under control of the Yaesu rotator.

Other equipment

Each station had a logging computer using N3FJP’s “ARRL Field Day Contest Log” software version 6.6. This setup had been thoroughly tested before Field Day in Joe’s basement. Joe was hoping to employ a com-

puter connection to his Icom IC-7410 transceiver for digital modes and to transfer band and mode data — but the radio link stopped working — so no digital contacts and band/mode changes had to be logged manually. The computers were connected by a combination of wired and wireless networking so that all contacts were recorded in a single database file and each station could keep an eye on what the others were working.

In order to claim a bonus for emergency power, the radio equipment was all connected to Bob N2CBH’s Honda EU2200i inverter-generator. Jon N2NBR supplied fuel from a bright yellow gas can.



Bob N2CBH’s Honda generator

Bandpass filters by W3NQN and Dunestar were in use to keep noise and strong signals out of the other stations’ receivers. A filter could not be used on 40 meters because of direct connection of transceiver to ladder line.

An army marches on its stomach

As 2:00 p.m. EDT Saturday approached Jared KD2HXC was busy stirring a large pot of **Shepherd’s Pie** in his ‘Dutch Oven’ — a cast iron cooking pot with tight-fitting lid. Jared served a first sitting of hungry workers with a hot meal, then prepared a second serving which was reported to be even better than the first.



Jared checks the oven.

Off we go

By the official start time of 2:00 p.m. the 20 meter station in the rental van and the 6 meter station in the baseball dugout were ready to go. The Hy-Gain tri-band beam for 20/15/10 meters was working well, with good directional properties despite its low height, while the repaired 6 meter beam was also performing to specification.



Tri-band beam on the tower. [Ray K2RCQ pic.]

The 40 meter station in the dugout had some early difficulties with the 3-element wire beam beyond the tuner problem. Several members noted that the 68 ft wire reflector element had slipped sideways so Jay lowered the wire, re-measured to the center then secured to the support point using vinyl tape. Another drooping wire element had to be straightened out.

Once matched, it was clear that the new wire antenna —

pointed east — was a **winner**, with many SSB stations worked over its 70° / 3dB beam-width, spanning north-west to



Joe WA2MCR operates 40 meter SSB while ye Editor logs. [Bruce KC2WGX pic.]

Canada, straight across the mid-west and around to the south-west. If you coughed in Cortlandt, hundreds of stations in Ohio, Michigan and Illinois would hear you and be deafened by your signal.

Daytime activity on 6 meters was partly in the hands of Ray W2CH and Marylyn KC2NKU who were visiting from Nashua NH. Stations worked on Saturday were mostly local in ENY, EPA and NNJ. The afternoon finished with a sudden shower at 6:30 p.m.

Overnight

As sunset approached, the temperature fell from 82° to around 73°F and radio conditions changed. The rental van switched to the G5RV antenna to take advantage of night-time propagation on 80 meters. Despite the antenna now being at the end of 200 feet of RG-213 coax, the band was in good shape and 252 stations were worked between 6:30 p.m. and 7:00 a.m.

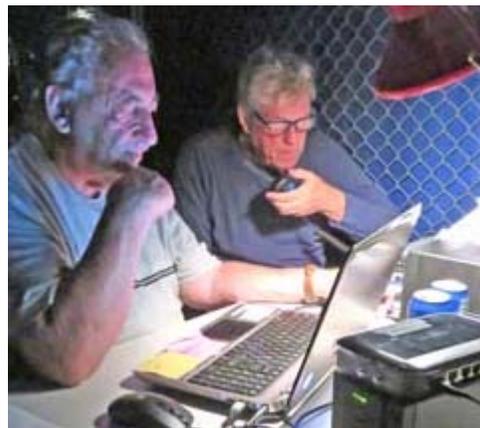


Vincent KD2VAV operates 80 meter SSB on Saturday evening with David KD2EVI.

John AD2CG and Verle W2VJ contributed to this overnight success.

At the 40 meter station, with the wire beam prop-

erly matched and propagation lengthening, the entire Midwest, Canada and West Coast came into range. Major contributions were provided by Lou KD2ITZ, Mike N2EAB, Jay NE2Q, Joe



Joe WA2MCR logs as David K2WPM makes many contacts on 40 meter SSB.

WA2MCR and David K2WPM. David achieved a peak QSO rate of more than 150 QSOs per hour (!) and worked all of California plus Guam and Hawaii.

While many members stayed to operate on Saturday evening and overnight, others were resting in tents ready for a fresh start on Sunday morning.

New dawn

Sunday began with a pleasant breeze and a mix of sunshine and clouds. The forecast was less pleasant with high humidity, more sun and temperatures rising to 90°F. Your editor had an early morning session on 20 meter CW, confirming that the tri-band beam was working well. Later I took my memory keyer to the 40 meter station and added QSOs with Canada and the Midwest. A significant number of stations were operating “1-delta” from home.

There was little activity overnight on 6 meters, but on Sunday morning the band opened with contacts to Florida, Louisiana, the Southeast and Midwest. Of special note are two contacts into the Caribbean



Vincent KD2VAV makes a 6 meter contact with Mike N2EAB logging.

with Trinidad/Tobago and Guadeloupe. Vincent KD2VAV, Mike N2EAB and Joe WA2MCR all contributed.

V.E. Test Session

As a new venture for PCARA, a Field Day Volunteer Examiner Test Session was organized for 10:00 a.m. on Sunday morning using tables and chairs near the school building. Two candidates arrived and were seated well apart. John N2ZWN of Fishkill suc-

cessfully upgraded from Tech to General while Frank Cola qualified as a brand new Technician. Thanks to our Team Liaison Mike W2IG and V.E.s Lou KD2ITZ, Verle W2VJ plus NM9J.

Teardown

By 12 noon on Sunday the G5RV and fan dipole antennas had been taken down as they were no longer needed. As activity was subsiding the 20 meter station was also disassembled. This left the 6 meter and 40 meter stations on-air until Field Day ended at 2:00 p.m. Despite the high temperatures, teardown was relatively fast and uneventful with a good number of members contributing to the effort. The rental van was off the field by 2:30 p.m., unloaded at Joe's, swept clean then returned to Cortlandt Town Center.

Results

A total of 25 radio amateurs came by to assist and operate during PCARA's Field Day 2021.

Bonus points were claimed for copying the **W1AW Field Day Message** (the CW bulletin went missing on Friday evening), for **Emergency Power** (2A, 200 points), for a **Public Location**, and for a **Public Information Table**. Karl N2KZ had publicized the event on PCARA's Facebook page for the **Social Media** bonus. Vincent KD2VAV made numerous contacts, earning 20 points for **Youth Participation**. Results were submitted to ARRL using the web-based app for the 50-point **Web Submission** bonus. The total was 670 bonus points.

Here is a summary of claimed points for PCARA Field Day 2021 (bold column) along with a comparison of scores from previous years, and a breakdown of contact numbers by band.

Peekskill/Cortlandt ARA, W2NYW, Class 2A

	2002	2003	2004	2005	2007	2008	2009	2011	2012	2013 (1A)	2014	2016	2017	2018	2019	2021
QSOs:	718	733	968	853	1019	1109	694	879	968	775	722	816	813	731	829	1366
Power:	2 (<150W)															
Partcpts:	15	11	12	10	14	10	10	14	15	14	16	19	22	22	29	25
Totl sc:	2,096	2,328	2,996	2,798	2,906	3,460	2,746	2,602	2,920	2040	2460	3018	2734	2886	2764	3662

2021 breakdown by band, in order of number of QSOs

40 meters – 953 QSOs; 80 meters – 252 QSOs
 20 meters – 90 QSOs; 6 meters – 61 QSOs
 15 meters – 10 QSOs,

Thank you

In 2021 PCARA had a **record** number of QSOs (1366) and a **record** number of total points claimed (3662), exceeding the previous high totals from 2008.



Top: distribution of 410 contacts on 40 meters during Field Day 2019 courtesy of Lou KD2ITZ. Red flag = SSB, Green = CW. Below: distribution of 953 contacts on 40 meters during Field Day 2021. [Maps by qsomap.org.]

Credit is partly due to the new tower/tri-bander and the forty meter flame-thrower antenna. **Well done** to **all** who contributed, including: Joe WA2MCR, Lou KD2ITZ and Vincent KD2VAV, Greg KB2CQE, David KD2EVI, David K2WPM, Ray W2CH and Marylyn KC2NKU, Mike W2IG, Todd N2MUZ, John AD2CG, Jay NE2Q, Rob KD2WCL, Nic KD2SKY, Mitch AD2CF, John AD2CG, Charles N2SO, Dan NT2I and Elliot KC2ZAB, Mike N2EAB, Tom K2UQT, Jon N2NBR, Bruce KC2WGX, Henry K2HPS (visitor), Bob N2CBH, Verle W2VJ, Ray K2RCQ and Mike N2HTT. We could not have done it without you.

Final thoughts

There were several setbacks during Field Day 2021, but Amateur Radio is nothing if not a learning experience and problems were largely overcome *in situ*. Suggestions for next time include... digital modes at all three stations and a balanced tuner for the 40 meter wire beam.

Bob N2CBH points out that Field Day provides an opportunity for things to go badly wrong, including protective equipment for people working on a heavy steel tower, safe use of pneumatic launchers, dehydration, exposure to RF, sun, plants and insects. ARRL makes bonus points available for having a Safety Officer on-site checking on 15 listed points. Even without a bonus, the Safety Officer sounds like a good idea.

- NM9J

Swimming pool skimmer pole vertical – K2WPM

Having accumulated several old swimming pool skimmer poles — as any good ham might — I asked: “can I make this into an antenna?” Spoiler alert: the answer is yes.



Lots of old swimming pool skimmer poles. [K2WPM pics.]

The first thing I learned is that skimmer poles — like many aluminum products — are **anodized**. What is anodized aluminum? According to the Aluminum Anodizing Council™ <https://www.anodizing.org> (yes, there’s really such a group):

“Anodizing is an electrochemical process that converts the metal surface into a decorative, durable, corrosion-resistant, anodic oxide finish. Aluminum is ideally suited to anodizing, although other nonferrous metals, such as magnesium and titanium, also can be anodized.”

“The anodic oxide structure originates from the aluminum substrate and is composed entirely of aluminum oxide. This aluminum oxide is not applied to the surface like paint or plating, but is fully integrated with the underlying **aluminum substrate**, so it cannot chip or peel. It has a highly ordered, porous structure that allows for secondary processes such as coloring and sealing. Anodizing is accomplished by immersing the aluminum into an acid electrolyte bath and passing an electric current through the medium.”

Is anodized aluminum a good conductor? My Internet research suggests it is **not**, so when I took the plastic compression fitting off the poles, I used a wire brush on my drill to remove the anodized coating, producing a shiny aluminum surface for connection of the two skimmer pole elements.



Aluminum pool poles before the anodized finish was removed.

I had to use my Dremel® tool for the “female” section, i.e. removing an-

odization from *inside* the receiving element. Application of Ox-Gard™, an inexpensive antioxidant compound from Lowe’s, was intended to reduce oxidation and enhance electrical conductivity — and also to reduce the chance of the sections seizing.



Pole ends after wire brushing to remove anodized surfaces, then coated with GB Ox-Gard antioxidant compound. Hose clamp is in position ready to hold the poles together.

The skimmer poles are lightweight and rigid, which I much prefer to a telescoping whip. And guess what, they are often about 16½ feet long... ideal for a 20 meter ¼-wave ground plane antenna. And if you don’t have any old ones laying around, you can buy a new one for \$26.00 from Home Depot:



<https://www.homedepot.com/p/HDX-16-ft-x-1-1-4-in-Dia-Anodized-Aluminum-Telescopic-Swimming-Pool-Pole-with-External-Cam-Set-61316/205542693>

So how does it work? I used an MFJ tripod, see photo. I took the swimming pool poles, sleeved them together and held them in place with stainless steel hose clamps. I used the “basic” swimming pool pole – 16½ feet long – and was happy to tune it up on 20 meters. (I have a radial plate with eight 30-foot radials.) It’s great fun to tell your QSO partner you’re working them on a swimming pool skimmer pole!

But the swimming pool pole vertical can also be a multi-band antenna. I constructed, one afternoon, a loading coil to help my shortened vertical operate on 40 and 75/80 meters. My first loading coil, the subject for a future article...

73, David K2WPM



Swimming pool pole vertical on MFJ tripod.

Handi-talkie choice

Return to the fold

After a spell operating in the 1960s as K0COZ, Nic recently returned to the amateur radio hobby with his new call sign KD2SKY. In a recent e-mail message, Nic posed the following question...



Nic KD2SKY.

Subject: Shopping for an HT

Malcolm –

There's such a dazzling array of HT's to select from I wonder if you might have a suggestion. I'm not on a limited budget, but I want to be sensible.

I'm interested in at least a dual-band radio, but I see that there are several which offer 222 MHz as well as 2 m. and 70 cm. (And the upcoming Bannerman's Island activity plans to include this third band.). In this area, is that additional band worthwhile?

Also, I see that there are some HT's that are analog only, and some now that will function in analog or digital. Is that a valuable feature?

Thanks for any help you might give.

73, Nic KD2SKY

Your editor sent the following reply. Note that this was a *personal* opinion. If you would like to offer different advice, feel free to express your own thoughts in writing.

Subject: RE: Shopping for an HT

Nic –

Normally there are lots of choices when it comes to HTs, but you may find that your actual choice is limited at the moment because of high demand and depleted supply. A quick place to check general availability is the Ham Radio Outlet site, <https://www.hamradio.com/search.cfm>.

Anyway — here are my own suggestions...

1. Steer clear of the cheap HTs from China – for example from BaoFeng / Pofung / Wouxun. While cheap enough to be almost throwaway and suitable for hazardous DXpeditions by canoe or landing in heavy surf, they have too many shortcomings for my liking. In particular, they are more like commercial



transceivers intended for use on limited business frequencies, so not easily adjusted from the front panel. Some of these radios may also be built to commercial narrowband standards (12.5 kHz channel spacing or less).

2. Keep to the “big three” Japanese manufacturers – Icom, Kenwood or Yaesu. They have been making transceivers for the international amateur market for a very long time and know the requirements of radio amateurs. They also make radios for the commercial / marine / business market, so there is some economy of scale.
3. Whether or not to go with a digital-voice capable radio is a tough decision. There are three-to-four main systems in use on the amateur bands. D-Star is only available from Icom (and possibly one Kenwood model.) System Fusion/C4FM is only available from Yaesu. DMR is not available from a big-three amateur manufacturer, instead you would need to purchase an ex-commercial transceiver (e.g. a Motorola) or a new TYT/Hytera/Anytone from China or the Far East — or similar. One thing to remember is that at the moment digital-voice VHF/UHF radios are also capable of operating on FM.



Digital voice capability will add to the cost of the radio and also to some extent reduce battery life because of the additional processing power required for A/D - D/A conversion.

Compared to analog FM activity, there is relatively little digital voice activity in our part of the world. However, I see DMR growing, mainly on UHF (so less range than VHF).

4. 220 MHz capability is nice-to-have but not a deal-breaker. There is very limited 220 MHz activity in our part of the world at present.
5. HTs increase in price going from single-band (usually 2 meters only) — to two band (144/440 MHz), but receiving only one band at a time — up to a full dual-band transceiver capable of listening on two different frequencies simultaneously on 144 and 440 MHz.
6. Whatever your choice, try to anticipate the accessories you will need. They are much easier to obtain while the transceiver is still current than after it becomes obsolete. I would look for at least one spare battery pack, a drop-in charger, a leather case and (possibly) a remote speaker-microphone so you can wear the radio on your belt while talking into the microphone — useful for longer assignments. Another accessory that can help is an after-market antenna that is more efficient than the rubber duck supplied with the radio.

— — —

I have two handi-talkies that are in regular use. The first is a Yaesu FT-70DR. This is a 144/440 one-band-at-a-time HT with Yaesu's System Fusion C4FM digital voice included. The second radio is an Icom W32A — that one is a much older FM-only radio, but it is dual band 144/440 MHz simultaneous and I used it on the recent fox-hunt. I don't think there is a modern equivalent at present — The Icom ID-52 with D-Star is not yet available (and probably very expensive).



Yaesu FT-70D and MH-34 speaker-mic.

Depending on how many frequencies you want to program into your handi-talkie, you may want to look into a suitable cable and programming software. Sometimes the cable is included and programming software is provided free by the manufacturer... but that's another subject altogether.

Final thought — with our present club repeater coverage and the hilly terrain, you may find that a handi-talkie is quite inadequate to access the PCARA repeaters from indoors. You may need to connect an external antenna or upgrade to a mobile radio running off a 12V power supply, plus external antenna for reliable repeater access.

Hope this helps! You may want to get another opinion from a different club member.

- Malcolm

.....

Separating the sheep

Nic KD2SKY has already settled on his choice of handie talkie — but the conversation need not end there. We have other readers who may have similar questions.

Do you have your own suggestions for newcomers who might be contemplating purchase of a first radio? Should it be an HF transceiver or something for VHF/UHF? Would an older model from a Hamfest table or from eBay be suitable? What do you think would constitute the best and worse choices? Do you have your own tales of triumphs and pitfalls?

Put your ideas down in electronic format and share them with newsletter readers.

- NM9J

More better batteries

In *PCARA Update* for January 2021 a short article entitled 'Better Batteries' described how Natron Energy of Santa Clara, CA has begun shipping its "Blue Tray™ Sodium-Ion 4000" battery based on Prussian Blue analog electrodes that allow **sodium ions** to flow in and out without hindrance.

Driving factor

One of the main reasons for researching new battery technologies is the shift toward **electric vehicles** (EVs). Concerns about climate change and air pollution are causing governments to legislate away from fossil fuels and encourage adoption of EVs. As soon as the cost of an electric vehicle approaches the cost of a gasoline or diesel powered vehicle, demand will take off.

The technology of choice for current electric vehicles such as the Tesla Model 3 or Nissan Leaf is the **lithium-ion battery**. This type of battery has higher energy density than older designs such as lead acid and can be charged and discharged rapidly. The cathode is usually made from lithium cobalt oxide (LiCoO₂) or lithium nickel-cobalt-manganese oxide ("NMC") while the liquid electrolyte consists of flammable organic compounds such as ethylene carbonate containing a dissolved lithium salt, for example LiPF₆. The anode is composed of graphite.

There are several drawbacks to lithium ion batteries — they are **expensive** because of high cost of the relatively rare elements lithium and cobalt. Lithium salts are mainly produced by mining ore in Australia or evaporating brine in Chile. Cobalt ore is mostly extracted from the ground in the Democratic Republic of Congo then refined in China. Armed militias and child labor may be involved in the Congo operations.

A fully-charged lithium-ion battery contains a large amount of **stored energy** — if a cell is damaged, the release of that energy in the presence of flammable electrolyte can lead to smoke and fire. When lithium-ion cells are stacked close together, a small eruption in one cell can result in thermal runaway with many more cells being destroyed. Famous examples include the battery modules in the Boeing 787 Dreamliner and batteries for the Samsung Galaxy Note 7 phone — a model that had to be



Charred lithium-ion battery from a Boeing 787 Dreamliner.

recalled in 2016. Fires in electric vehicle batteries are rare but dangerous — the battery can reignite even after the vehicle fire has been extinguished.

Better safe

No wonder that battery companies and vehicle manufacturers are looking for an alternative to the lithium ion battery. At present, the most likely technology to take over is the **sodium ion** battery, one example of which was the Blue Tray™ mentioned earlier. Energy density was not as high as for lithium-ion, so early applications have been for static devices such as uninterruptible power supplies (UPS) and energy smoothing of wind and solar farms.

UK company Faradion (named after Michael Faraday) has been developing rechargeable sodium-ion technology since 2011. See: <https://www.faradion.co.uk>. The Sheffield-based company claims their sodium-ion batteries are cheaper and safer than lithium-ion, with a *higher* energy density and a wider operating temperature range than other batteries. Their intellectual property portfolio includes more than 21 patent families describing cell materials, structure, safety and transportation.

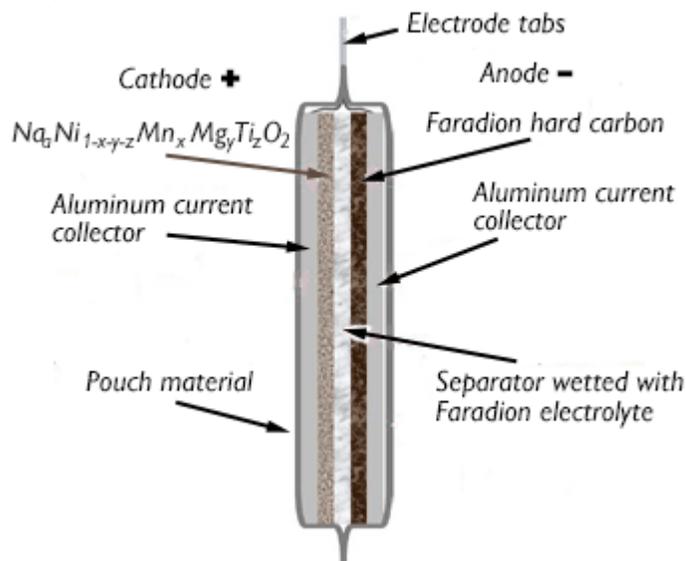
Faradion's patented zero-volt capability is said to enable the safe transportation and maintenance of sodium-ion batteries. Lithium-ion cells must be stored and transported in a *charged* state, making them less stable and more prone to fire. In contrast, Faradion's cells can be discharged to **zero volts** then recharged without damage. Discharged sodium-ion cells contain less stored energy and are safer to transport than lithium-ion. The electrolyte is also less volatile. Faradion cells are actually stored and shipped with the external connections shorted together.



Sodium-ion pouch cell by Faradion with terminals shorted.

Patent protection

Faradion has a wide range of patents on sodium-ion technology. Their cells typically contain a cathode made of sodium/nickel/manganese/magnesium/titanium oxide. Sodium ions (Na^+) can fit into the inter-layer space of these layered oxides. The anode consists of a carbon-coated current collector, for example aluminum metal coated with Carbotron-P hard carbon prepared from petroleum pitch. The electrolyte consists of sodium salts such as sodium hexafluorophosphate, NaPF_6 dissolved in a mixture of mainly propylene carbonate with ethylene carbonate, diethyl carbonate and other compounds. Use of a high flash-point electrolyte



Construction of a sodium-ion pouch cell. [After Faradion.]

also improves safety.

Current developments

Faradion has partnerships with Jaguar, Land Rover and several U.K. universities. The company has demonstrated an E-Bike and E-scooter with 400 – 800 watt-hour battery packs.

U.K.-based AMTE Power (formerly AGM Batteries Ltd) has carried out a prototype run manufacturing Faradion sodium-ion cells at the company's lithium-ion manufacturing facility in Thurso, Scotland.

Faradion recently formed an R&D partnership with oil company Phillips 66 to investigate Phillips' hard carbon as anode material.

A recent deal with Australian industrial conglomerate ICM is aimed at energy storage systems, primarily for household batteries to complement solar photovoltaic installations.

Faradion reports that Infraprime Logistics Technologies (IPLTech) in India will employ Faradion's high energy sodium-ion batteries to power commercial vehicles for the Indian market.

- NM9J

13 Colonies - K2WPM

A Fun Special Event

13 Colonies has become a popular special event in U.S. Amateur Radio, chalking up over 202,000 QSOs last year. No, it's not a contest. But what is it?

When?

The special event occurs July 1, 2021 at 1300 UTC (8:00 a.m. EDT) to July 8, 2021 at 0400 UTC (midnight EDT). The website for this event is located at <http://www.13colonies.us/>



Screen shot of 13 Colonies web site.

What?

Thirteen Colonies is the group of British colonies that declared independence in 1776. The concept is for the 13 original colonies to get on the air, during the week surrounding Independence Day July 4, and make lots of contacts. Each colony is assigned a unique call sign, for example New York is **K2A**. Radio amateurs then try to contact all 13 colonies for a “clean sweep.” There are three additional bonus stations, GB13COL (Great Britain), WM3PEN (Philadelphia) and TM13COL (France). The event is organized by Ken KU2US.

Why?

The event is for fun, and is intended to remind us of our early history, which is why the event embraces the July 4 week. Many of us who have activated stations under the 13 Colonies call signs (in my case, **K2B** for Virginia) have tried to include in our talk-time, a few facts about our colony’s early history.

The certificate is much-desired by hams. Based upon the log submitted, KU2US will then print a custom certificate showing not just your call, but also how many colonies you contacted. A “clean sweep” merely requires logging contacts with the 13 Colonies.

Where?

All amateur bands (except 60 meters) and all modes are in play. The ham activators will be transmitting from the 13 Colonies (or Great Britain / France in the case of bonus stations). Any radio amateur anywhere, is invited to participate. This year, we are putting a special focus on getting satellite contacts.

Who?

The 13 Colonies, as well as the bonus stations, are staffed by operators within the respective jurisdiction(s). I have the privilege of being K2B Coordinator for Virginia Colony this year. In that capacity, I have selected some 25 hams all around the state, and set up a schedule of operations over the seven-day event. If you hear K2B, I hope you will work us and spot us!



K2B QSL card depicts the Continental Navy's Bonhomme Richard.

The 13 U.S. Special Event stations will be:

- K2A New York
- K2B Virginia
- K2C Rhode Island
- K2D Connecticut
- K2E Delaware
- K2F Maryland
- K2G Georgia
- K2H Massachusetts
- K2I New Jersey
- K2J North Carolina
- K2K New Hampshire
- K2L South Carolina
- K2M Pennsylvania



Peekskill / Cortlandt Amateur Radio Association

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

PCARA on Facebook: <http://facebook.com/pcarahamradio>

PCARA Update Editor: Malcolm Pritchard, NM9J

E-mail: NM9J 'at' arrl.net

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 the first Sunday of each month (apart from holidays, July/August break and pandemics). Talk-in is available on the 146.67 repeater.

PCARA Repeaters

W2NYW: 146.67 MHz -0.6, PL 156.7Hz

KB2CQE: 449.925MHz -5.0, PL 179.9Hz

N2CBH: 448.725MHz -5.0, PL 107.2Hz

PCARA Calendar

Masks and Social Distancing may be required.

Sat Jul 24: PCARA Breakfast, 9:00 a.m. Downing Park Pavilion, 2881 Crompond Rd (Rt. 202), Yorktown.

Sat Jul 24: PCARA VE Test Session, John C. Hart Memorial Library, Shrub Oak. 11:00 a.m. See below. PCARA will be on **summer break** until September. Keep an eye on the PCARA web site, Facebook page and Google Group for additional announcements, including details of the September meeting.

Hamfests Check with the organizers before leaving.

Sat July 10: Raritan Valley RC W2QW Hamfest, Piscataway HS, 110 Behmer Rd, Piscataway NJ. 8:00 a.m.

Sun July 18: Sussex County ARC Hamfest, Sussex County Fair Grounds, 37 Plains Road, Augusta, NJ. 8:00 a.m.

Sat Aug 21: East Greenbush ARA Hamfest, Town Park Rd, East Greenbush, NY. 8:00 a.m.

Sun Aug 29: Candlewood ARA Western CT Hamfest, Edmond Town Hall, 45 Main St., Newtown CT. 8:00 a.m.

Sun Sept 12: Orange County ARC Hamfest, Wallkill Community Center, 7-9 Wes Warren Drive, Scotchtown, NY

VE Test Sessions Check with the contact before leaving.

July 3, 10, 17, 24, 31: Westchester ARC, 19 Hunts Bridge Rd, Yonkers NY. 12:00 noon. Must contact VE, (914) 237-5589.

July 3, 10, 17, 24, 31: NYC-Westchester ARC, 43 Hart Ave, Yonkers NY. 12:00 noon. Must contact VE (646) 225-8600.

July 16: Orange County ARC, Munger Cottage, 183 Main Street, Cornwall NY. 6:00 p.m. Contact Joseph J. DeLorenzo, (845) 534-3146, w2bcc'at'arrl.net

July 24: **PCARA**, John C. Hart Memorial Library, 1130 E Main St., Shrub Oak NY. 11:00 a.m. Must register or call ahead — Michael W2IG, w2igg'at'yahoo.com, (914) 488-9196.



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