



# PCARA Update



Volume 21, Issue 10 Peekskill/Cortlandt Amateur Radio Association Inc. October 2020

## Fall into order

The September PCARA Membership meeting was held on Sunday September 13, 2020 at 3:00 p.m. on the porch of the John C. Hart Memorial Library in Shrub Oak, NY. Nineteen were in attendance (*sans* yours truly — I had to work) and all were masked and practiced responsible social distancing.



September's socially-distanced meeting took place on the porch of the John C. Hart Library in Shrub Oak.

At the meeting a motion was made, seconded, and approved to donate \$100 to the **USS Slater Destroyer Escort Historical Museum** in Albany, NY as a show of support for a very good cause that keeps our country's History alive. PCARA has a past with the *USS Slater* dating back to March 2018, when Navy Radioman Stan Levandowski WB2LQF presented "The Three Lives of the *USS Slater* DE-766" at the monthly membership meeting. Once again, I am suggesting that a road trip to Albany is in order. Please let us know what you think at mail@pcara.org.

At the PCARA September Membership Meeting it was decided that due to the late meeting date in September and COVID-19 issues, there would not be a need to meet in October. This doesn't mean that nothing will be happening in October! Here's what we have coming up:

- Our next **PCARA Breakfast** will be held on Saturday October 17, 2020 at 9:00 a.m. in Downing Park in Yorktown Heights. NY.

- Saturday October 17, 2020 is the **NY QSO Party**. As in years past, PCARA will be sponsoring plaques for NY Multi One - Low Power and Non NYS low power. Participation rules pending. [See page 10 -Ed.]
- Join us on Wednesday October 21, 2020 at 8:00 p.m. for a virtual Zoom presentation of "**The Magic of Amateur Radio**" by Todd N2MUZ. A Q&A session will follow. Please feel free to **share** this information with anyone interested in Ham Radio. [For details see 'Presenting radio' page 8 - Ed.]
- The **Roundtable** and **Old Goats** Nets continue Tuesdays and Thursdays respectively, at 8:00 p.m. on the W2NYW repeater (146.670 MHz (-), PL 156.7 Hz).
- This year the 40<sup>th</sup> **Annual Harry Chapin Memorial Walk/Run Against Hunger** will be *virtual* (between October 10<sup>th</sup> and October 18<sup>th</sup>) and as a result will require our "*virtual*" radio support. Let's hope that next year we will be actually using radios to support this most important annual event around Croton-on-Hudson. For more information on the 40<sup>th</sup> Annual Harry Chapin Memorial Walk/Run Against Hunger please visit: <https://runagainsthunger.com/>.

N.B. The November **PCARA Membership Meeting** will be held on Saturday November 7, 2020 at 9:00 a.m. on the front porch of John C. Hart Memorial Library in Shrub Oak, NY (due to COVID-19 precautions). Remember to bring your own chair and mask. The meeting will be followed by a *contd. on p 2* ⇒

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**PCARA V.E. Test Session** at 11:00 a.m, also on the porch of the library. Candidates **must** contact Mike W2IG at: w2igg'at'yahoo.com to pre-register. If you know of anyone interested in testing, please let them know.

On behalf of the PCARA Membership, I wish to extend our sincere thanks to the John C. Hart Memorial Library for their continued support.



*In recent years the John C. Hart Memorial Library has supported various PCARA activities .*

Remember that we have our Annual Elections at the November meeting. This year is an even year so nominations for two (2) two-year terms are due. These are seats currently held by Directors Bob, N2CBH and Mike W2IG.

I look forward to seeing each of you on November 7<sup>th</sup>. Please stay safe and keep your heads down! We will get through this together. EXCELSIOR!  
- 73 de Greg, KB2CQE

## PCARA Board

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Greg Appleyard, KB2CQE; kb2cqe 'at' arrl.net  
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Secretary:

Lou Cassetta, KD2ITZ, radiocassetta 'at' gmail.com  
Directors:

Bob Tarsio, N2CBH  
Mike Dvorozniak, W2IG

## Net nights

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

# Adventures in DXing

- N2KZ

## My Favorite Neighborhoods

After DXing for decades, you get to know every corner of every band there is. We all have our favorites and preferences. There are so many places to visit and adventures to discover. Here is a short tour of the memorable places on my mind. I would love to hear all about yours! Let's get started...

In the very beginning, two frequencies were used for sending messages: 100 kilohertz (3000 meters) and later 500 kilohertz (600 meters.) This was the early era of spark transmission when frequencies were determined using mechanical generators spinning wildly to obtain their place on the dial. As the calendar approached 1920, electronic oscillators were adopted replacing the behemoth mechanical spinning generators previously used. Much higher frequencies became practical. It was a new world!

833 kHz became the place to look for all voice broadcasting. Why 833 kilohertz? It calculates to a 360 meters wavelength. If you were tuning



*KDKA Pittsburgh was one of the early broadcasters on 360 meters / 833 kHz.*

around looking for someone, (anyone!) broadcasting before 1920, this was the place to be. Shortly thereafter, 619 kHz (485 meters) was added as a second frequency to eliminate clashing of signals on 833 kHz. You would find full-service entertainment on 833 and news and weather on 619... at least in theory!

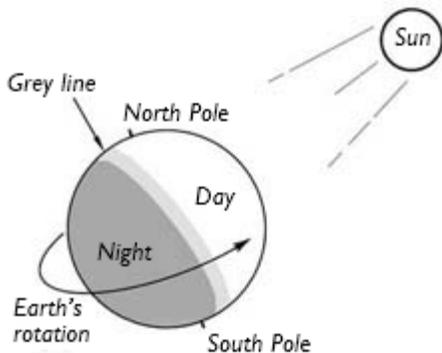
In short stead, more and more pioneer broadcasters were eager to find their way onto the air. Two frequencies were not enough! Something had to be done to accommodate this unbridled expansion. When the medium wave broadcast band was formalized by the new Federal Radio Commission in the mid-1920s, the AM broadcast band was stretched from 550 to 1500 kHz in ten kilohertz steps.

Avid radio experimenters looking to advance this new craft needed to move to remote and exotic places on the dial unknown to casual listeners. Welcome to the world above 200 meters (1500 kHz.) This territory was considered radio's wild, wild west! No one had ventured this high ever before. These frequencies were considered useless and impractical and simply a waste of time... until experimenters started to appreciate them!

## Top down approach

A full century later, we know and love these once inhabitable frequencies above 200 meters as the amateur 160 meter band – 1800 to 2000 kilohertz. Many of us started on this band and it survives to this day. Ironically, two newly allocated amateur bands repeat our early transmitting history: We now have access to spectrum at 2200 meters – 135 kilohertz and 630 meters – 472 kilohertz, very similar frequencies to the ones the ancients originally used more than a century ago!

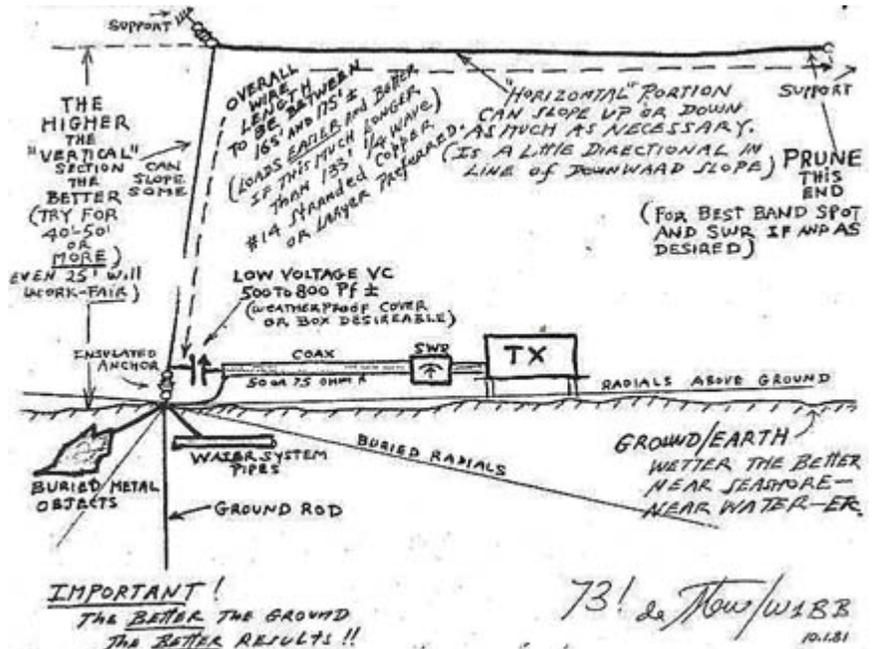
160 Meters is a band that requires skill, thought and patience. During daylight hours it offers only very local coverage. Things start getting interesting at sunset and sunrise when ‘grey line’ propagation can spread your signal along the areas that are turning from day to night or vice versa. These medium distance contacts occur during the first few hours of darkness and at dawn. As



Grey line propagation is the result of low MF and HF absorption in the region between day and night.

If you just happen to be awake in the wee hours of the night, try tuning around on the AM broadcast band and 160 meters. You may hear miraculous things! In my experience, ‘magic hour’ happens around 2:30 a.m. Learn to become a very good listener. Successful 160m operators know how to use noise filtering on their transceivers and are adept at pulling out complete messages listening to broken pieces of CW. Put on some coffee and try it out one night!

160 meters also requires space for sizable antennas and counterpoise ground systems. The most common antenna for this band is an ‘inverted L,’ which is actually a 150 foot or so vertical antenna bent over for your convenience. A few ground wires and stakes will improve your efficiency immensely. The wizard of 160, Stew Perry W1BB (now SK) is considered the grandfather of 160 meters. His enthusiasm and



**IMPORTANT!**  
THE BETTER THE GROUND  
THE BETTER RESULTS!!

Inverted L antenna for 160 meters as drawn by Stew Perry W1BB (SK).

research encouraged many of us to try an inverted L.

Propagation on 160 meters is often mysterious. Openings can happen without notice especially during nighttime hours. You need two things for operating 160: The ability to endure listening to loud static crashes for hours at a time (lovingly known as ‘static salad,’) and the ability to survive with little or no sleep! Look for weak signal CW on and around 1810 kHz. Rag chew SSB and some AM can be found around 1950 kHz. You will become acquainted with the regular crowd on 160 before you know it! Only the best operators understand and enjoy 160 meters. That’s another reason it is known as the ‘Top Band!’

## Matey eighty

My very first HF QSOs were on the 80 meter band. You’ll find the first 25 kilohertz – between 3500 and 3525 – are where expert CW ops reside sending fast speed code looking for DX. More casual CW contacts occur between 3525 and 3550 kHz. Slower speed CW QSOs pop up around 3558 and low power QRP experimenters hover around 3560 kHz. Various digital modes occupy the next 40 kHz or so between 3560 and 3600 kHz.

The world above 3600 kHz is often packed with ‘quacky-duck’ LSB voice transmissions. You’ll find an endless coffee klatsch of AM operating on and around 3885 kHz. Scheduled group ‘nets’ are usually packed into the 3900 to 4000 kHz segment day and night.

If you are interested in learning Morse Code, the ARRL’s station in Newington, Connecticut (near Hartford) broadcasts weekday slow code practice sessions on 3.5815 and 7.0475 kHz on Mondays at 7pm, Tuesdays at 4pm, Wednesdays at 9am and 7pm, Thursdays at 4pm and Fridays at 9am – All times Eastern Local.

A complete schedule of W1AW broadcasts can be found at: <http://www.arrl.org/w1aw-operating-schedule>. You can also listen to W1AW on your smartphone: Use Echolink

group W1AWBDCT to connect. Important reminder: Technicians can operate CW on 80, 40, 15 and 10 meters with 200 watts today! No upgrade needed!

Please take note of the very popular FT8 digital mode.

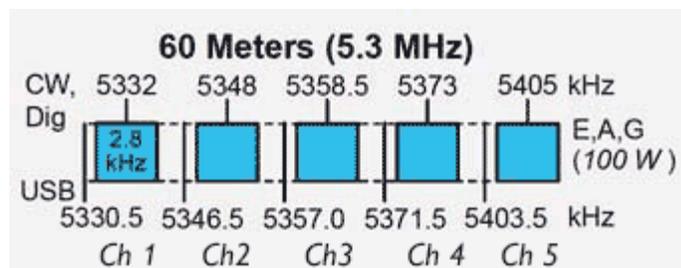
FT8 sounds like a bevy of screaming sirens in Hades. FT8 spots serve as a frequency marker when you are first finding your way onto a band with a broad tuner. Look for FT8 transmissions on 1840, 3573, 7074, 10136, 14074, 21074, 24915, and 28074 kHz. A wonderful guide to the mysteries of FT8 can be found at: [https://www.g4ifb.com/FT8\\_Hinson\\_tips\\_for\\_HF\\_DXers.pdf](https://www.g4ifb.com/FT8_Hinson_tips_for_HF_DXers.pdf).



Part of the antenna farm at ARRL Headquarters station W1AW.

### Sweet sixty

The relatively new 60 meter band is unusual because it is channelized. 5 allocated frequencies are shared between voice and data use. In practicality, most voice (all upper sideband) will usually be found on channels 1 and 2. Channel 3 is forever occupied with FT8 communications. Channel 4 and 5 hosts either USB or CW. This is another band that has many regular participants. You will also find a variety of voice nets late afternoons and early evenings on channels 1 and 2. 60 meters is a very nice and quiet band with thoughtful and courteous participants.



The five channels of 60 meters are assigned by center frequency, with USB carrier frequency also indicated.

### Fine old forty

40 meters is a classic amateur radio band that originally was all CW. Times have changed and CW has been chased to the bottom of the band to make room for data and lots of LSB voice. Similar to 80 and 20 meters, the first 25 kHz (7000 to 7025 kHz) is used by Extra Class operators for high speed code and DX. 7030 kHz has become the QRP frequency of choice and a place to try slow speed code. Look for more slow speed code around 7058 to 7060 kHz. RTTY data hangs out around 7040 kHz.

Voice ragchews go on almost continuously on the ECARS (east coast - 7255 kHz) or MIDCARS (midwest - 7258 kHz) LSB nets. AM operations show up on 7290 or 7295 kHz. A good propagation beacon is Canada's CHU time signal on 7850 kHz broadcasting from Barhaven, Ontario near Ottawa. The area between FT8 at 7074 and 7100 kHz is an often disregarded and under-used piece of CW spectrum. You can create some very interesting QSOs by calling CQ on CW in these parts. The area between 7100 and 7125 kHz is still a haunt for slow speed code and legacy check-in nets. You will often find newcomers to CW here especially on Saturday and Sunday mornings and evenings. 40 meters also enjoys very nice propagation from New Zealand and Australia early mornings on the East Coast here in America.

### Thirsty thirty

To CW operators, 30 meters is an oasis. What could be better? It is a little enclave that is somewhere between 40 and 20 meters in propagation and almost always open for business. It is CW only here until you get into the higher-up part of the band between 10130 and 10150 kHz where you will find various data modes. 30 meters is a WARC (World Administrative Amateur Radio Conference) band. Created in 1980, you will never hear contest traffic here — or on 12 and 17 meters, too. Power is limited to 200 watts and these bands are not to be used for contesting or any phone operation. 30 meters is a great place to hide!

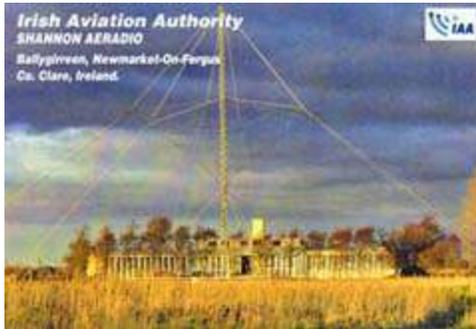


Like 60 meters, 30 meters is a nice quiet band where only General, Advanced and Extra Class operators may go. You will find some nice Eastern European DX starting about noon Eastern time. As the day progresses, reception into Western Europe follows until dinner time or even later here on America's East Coast. Early mornings you might find yourself being heard by stations along the Pacific Ocean Rim like Australia,

New Zealand and Japan. After you get to know 30 meters, you might never want to leave!

### Flying tonight

A quick note about using VOLMET stations as propagation beacons: Around the world there are radio broadcasts transmitting aviation weather on a variety of frequencies. Most operate 24 hours a day broadcasting at specific hour parts — for example 15 and 45 minutes after the hour. They can also be used as great indicators to see if a band is open to a particular direction. I use Shannon Aeradio's broadcasts from Ireland on 5505 kHz to measure the possibility of European contacts via 60 meters. A comprehensive list of VOLMET stations can be found at: <http://www.dxinfocentre.com/volmet.htm>. See how many you can log and enjoy what they can tell you besides the weather!



*Shannon Aeradio QSL.*

### Plenty on twenty

20 Meters is a grand old band. It is certainly DX headquarters and the home of many special interests as well. 20 meter antennas are also reasonable in design and length with an overall dipole length of just under 35 feet. It is easy to make a simple installation from house to tree. You'll probably always find someone to talk to on 20 meters no matter what hour of the day or night you try. Lots of people like it and it is easy to understand why.



*Monoband Yagi for 20 meters.*

The first 25 kHz of 20 meters (14000-14025 kHz) is the big league of CW operation and contesting. You will hear lightning fast speeds and fantastic pile-ups here, often reaching as high as 14050 kHz. The region between 14050 and 14060 caters to a more casual CW

crowd. Sending speeds are slower and QSOs are not as frenetic. 14060 kHz is the Mecca of all QRP CW activity along with mountain toppers, mobiles and all sorts of other interesting situations!

From 14065 to 14100 kHz, you will hear all sorts of data like RTTY and FT8. The area between 14100 and 14150 can be a strange place that is often overlooked. Take a chance at a CQ in this sector if you seek adventure. It may pay off!

The upper sideband 'quacky-ducks' begin at 14150 kHz and things can be relatively quiet and sane for the first 25 kHz reserved just for Extra Class hams. Activity gets cluttered and very active from 14225 to the band edge at 14350. You'll find slow scan TV transmissions at 14230 kHz that sound like an old fashioned dial-up modem negotiating and squealing away. Try using Multiscan 3B for Mac (<https://www.qsl.net/kd6cjl/>) or MMSSTV for Windows (<https://www.dxzone.com/catalog/Software/SSTV/>) and see if you can get the picture.

### Take a WARC

17 meters and 12 meters are also WARC bands. They offer both phone and CW allocations and enjoy some of the same characteristics of the other WARC band 30 meters. Operators tend to be serious and genteel hams who enjoy good sport. Being WARC bands, you will not hear contesting here, either. Both 17 and 12 are dependent on sunspot activity but can produce some wonderful experiences when they are riding the wave of being at the MUF (maximum usable frequency) where the skip can be long and exotic!

### Lean fifteen

15 meters used to be a launch pad for many new Novice amateurs. The traditional dipole antennas are short — only about 23 feet! The frequency allocations left plenty of room to operate. When there was sunspot activity, you could get a really good idea of the potential of this band with very little output power. When there are no sunspots, life can be rather lonely on 15 meters. Don't despair! I actually worked a Russian ham based on Antarctica on 15 meters when the band sounded dead. It was a very easy QSO. Big signals into my Heathkit HW-16. Big smiles from the operator!

### Ten has FM

10 meters can create amazing magic. Using a straight key on my passenger seat, I have literally worked the world on 10 meter CW using a 25 watt mobile rig and a cut-to-length CB mag-mount whip on my car roof. You will find good Morse activity between 28020 and 28030 kHz most days. Some slower stations will go as high as 28050 kHz. Between 28150 and 28300 kHz, you will find many, many beacons to use

for propagation monitoring. A great list of 10 meter beacons can be found at: <https://www.ten-ten.org/index.php/resources/ten-meter-beacons>.

The majority of 10 meter phone activity happens inside the section roped off for Novices and Technicians: 28300 to 28500 kHz. You will often hear trans-equatorial skip come in bringing stations from all over South and Central America. Europe is quite possible during high sunspot activity. I have worked stations all over the Pacific Rim and beyond in the late afternoon and evening hours. Amazing armchair copy of someone in Japan never ceases to amaze.

If you enjoy FM operation, please don't forget the 10 meter FM allocations.

Start with the simplex calling frequency of 29600 kHz. Surrounding this frequency are four repeater pairs:



Many HF transceivers like this Yaesu FT-450 can operate FM mode on the ten meter band.

(input and output) 29520/29620, 29540/29640, 29560/29660 and 29580/29680 kHz. Even if you do not have gear for 10 meter FM, you can listen in and join the fun. Program these frequencies into a scanner and enjoy! The Rockland Repeater Association has a linked 10 meter repeater connected to their powerful 70cm repeater on 443.850 MHz. Using their 70cm link to their 10 meter repeater, I have worked international DX while walking my dog holding just a modest HT in my hand with a rubber duck antenna!... and it was all FM! For details on the RRA's complex repeater system, check out: <https://www.rra.net/>.

### Treasure map

Let me leave you with some basic advice: Get on the air! Amazing contacts are just waiting for you — and now you have a road map to take you there! Enjoy the hobby and let me know who you work!

Remember our Roundtable Net on Tuesday nights at 8:00 p.m. and The Old Goats Net on Thursday nights at 8:00 p.m. on the PCARA repeater at 146.67 MHz -600 offset 156.7 PL. All welcome! Until next month, 73s and dit dit from Karl N2KZ 'The Old Goat.'



## V.E. Test Session

PCARA's first test session following a long, eight-month pause took place on Saturday September 9. After enjoying breakfast at the Downing Park Pavilion, several Volunteer Examiners made the short journey along Rt 132 to Shrub Oak and the John C. Hart Library, where PCARA's VE Team Liaison Mike W2IG was busy setting up on the Library porch, ready for the session to begin at 11:00 a.m.



PCARA's September 9 VE Test Session took place on the porch of the John C. Hart Library.

This was to be PCARA's first test session held **outdoors**. Fortunately, the early morning mist had dissipated by start time and the temperature had risen to 72°F. Tables and chairs had been brought along so that candidates had a place to sit and fill out their answer sheets.

Two candidates attended the session and both were successful. Brian Pouliot of South Salem, NY passed the Technician examination, while Henry KD2UPD of Peekskill upgraded from Technician to General. Well done!

Thanks to the Volunteer Examiners who attended the session including Mike W2IG, Stan WA2NRV, Lou KD2ITZ and NM9J.



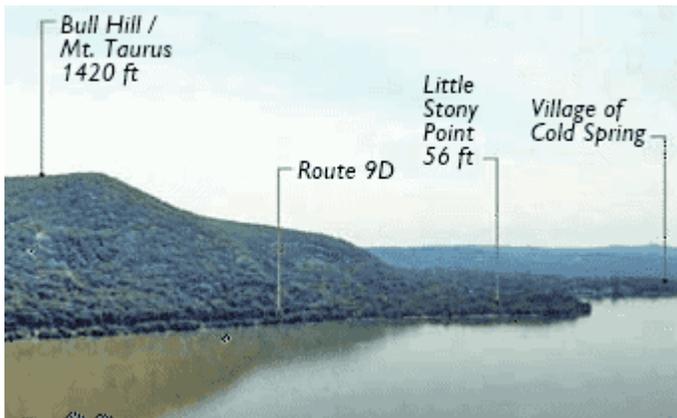
Candidates were masked and socially distanced on the library porch.

PCARA's next VE Test Session is scheduled for Saturday November 7 at the John C. Hart Library, following immediately after the November membership meeting.

# Return to Mt. Taurus

– KD2ITZ

Readers may recall that PCARA and the Appalachian Mountain Club had previously organized an outing to Mount Taurus (Bull Hill) near the village of Cold Spring, which was described in the May 2018 newsletter. After a two-year absence, I recently returned there for another great hike. The weather on August 30<sup>th</sup> was mostly sunny with a high temperature of 77 degrees. Perhaps I wasn't the only one who thought it was a fine day to be outdoors? The parking lot on Route 9D was already full shortly after 10:00 a.m. on a Sunday, necessitating a short drive back into town to leave the car by Northern Ave.



Bull Hill — view showing locations and elevations of Mt. Taurus and Cold Spring. [Pic credit: NYS]

During the ascent to the 1,421 foot summit, I enjoyed looking out toward the skyscrapers in Manhattan over 45 miles away. A detour east along the Undercliff Trail was rewarded with majestic views of the



Bull Hill trail map [Image: NYS]

Hudson and beyond.

While on the Undercliff trail, I was happy to hear activity on 146.52 MHz. Two stations signed off and a third amateur, Jon KC2BNW, called CQ. When I answered, he reported that he was only running half a watt, but had

a strong signal because he was also on-site at Mt. Taurus. We had a brief chat, and agreed to meet in person later that day. The first time that I made contact with Jon was on 10m back in March. He was operating portable at 5 watts from Lake Casse in Putnam County and I could barely copy him at my home in Yorktown. Thankfully, I had the benefit of a relay from Jay NE2Q who heard everything from his hilltop QTH in Pound Ridge.



Jon KC2BNW. [KD2ITZ pic.]

Jon was not my only contact at Mt. Taurus. Although I wasn't able to reach the W2NYW repeater on the Undercliff Trail, the tower site came into view as we ascended the Washburn Trail. I contacted David KD2EVI through the repeater, and we quickly moved to 146.565 simplex. My elevation offered a definite advantage. Though I was only using a 4 watt Baofeng UV-5R, excellent signal reports were exchanged.



Jon's go-bag contains numerous safety essentials as well as amateur radio equipment.

After I completed the 5.5 mile Bull Hill loop, Jon and I met across the street from the trailhead. He works with the State Parks Department and spends a lot of time outdoors. He was carrying a go-bag with numerous safety essentials neatly organized in various compartments. He packs a solar battery charger which he uses as a reserve power source for his versatile Yaesu VX-1R. This compact handheld

weighs just over 4 ounces. It has a wideband receiver and can transmit up to one watt when connected to external power. Jon likes to demonstrate his equipment and expeditions on his YouTube channel:  
<https://www.youtube.com/user/TheFossilChannel>

During these times of social distancing, hiking remains more popular than ever. To encourage the safe enjoyment of our outdoor resources, volunteer trail stewards are needed at Mt. Taurus and other locations throughout the region. The NY-NJ Trail Conference notes that:

Stewards educate and assist the public in the safe, responsible, and enjoyable use of trails and parks. Our Stewards provide helpful outreach and information about park regulations, hiker safety, preparedness, and other best practices.



This would be a great opportunity for hams to give back to the community, while promoting the value of amateur radio for preparedness and safety on the trail. To learn more about volunteering, visit:  
<https://www.nynjtc.org/>

No doubt, PCARA will be planning outdoor expeditions again soon. In the meantime, keep your radios tuned to the various simplex frequencies. Don't forget to check spotting networks for Summits on the Air and Parks on the Air activity. Low power stations have big signals from the hilltops.

- Lou, KD2ITZ

## Elections

A major item on the agenda for the November meeting is **nominations** for the Board of Directors. In this even-numbered year the nominations are for two Director positions, each with a term that runs two years. Please direct your suggestions/nominations to the Board.



- Lou KD2ITZ

## Presenting radio - KD2ITZ

PCARA is pleased to announce an informative teleconference for people looking to get started in amateur radio. This virtual presentation titled "**Magic of Amateur Radio**" will be hosted by Todd Traver N2MUZ. It will be held live via Zoom on Wednesday 10/21/20 at 8:00 p.m. All are welcome, but the information will be presented at a basic level targeted toward individuals currently unfamiliar with the amateur radio service. Please tell your friends. PCARA is thankful to the many community organizations who are also promoting this event, especially John C. Hart Library.



Yaesu VX-1R microminature 2 meter/440 HT.



### Meeting information

Join Zoom meeting:

<https://us02web.zoom.us/j/81572164881>pwd=ZHNwVnQ3am5rcG9GYXVUL0tjdStUUT09

Meeting ID: 815 7216 4881 Passcode: 734320

One tap mobile: +19292056099,,81572164881#,,,,

For more information contact: mail[at]pcara.org

- Lou KD2ITZ

[**Hint:** If you have not used Zoom before, there is a short introduction for computer, smartphone and tablet use at the following web site:

<https://www.digitalunite.com/technology-guides/online-collaboration-tools/online-meetings/introduction-zoom-meetings> - Ed.]

# Power Supplies - w2vj

## The Good, the Bad, and the Knobby

Switched-mode (or switching) power supplies have a bad rep. They're not linear. They generate radio frequency interference (RFI), or "birdies," that can wipe out weak to moderate received signals if your antenna is nearby. Compared to linear power supplies, however, they are cheaper, smaller, much lighter in weight, and more efficient. For example, if you're



Astron RS-35M-AP linear power supply is rated at 13.8V DC, 35A peak output, 120V AC input, with front panel meters and Anderson Powerpole Connectors.

looking for a 13.8 volt DC power supply with 25 amps continuous and 30 to 35 amps surge to run a 100 watt transceiver, the linear Astron RS-35M-AP costs about \$225 and weighs 25 pounds, and the Astron VS-35M-AP costs about \$250 and weighs 29 pounds. The switched-mode Jetstream JTPS32MAB cost me about \$85 and weighs 3.5 pounds. All have meters and Anderson Powerpoles®.

Another caveat — differing reviews on eHam.net of the Jetstream (and many other products, for that matter) indicate that one may have excessive fan noise while an identical model is extremely quiet. Luckily, I did not get one of the lemons.



Jetstream JTPS32MAB is rated 30A peak, 25A continuous, with meter, 'Shifter' knob and Powerpole connectors on the front panel. [W2VJ pic.]

If you decide to throw in your lot with a switching power supply, look for one that promises low RFI. It might be an even safer bet to get one with a noise "shifter" or "offset" knob. By turning the knob slightly, you move the noise away from the received signal. Of course, rather than rely on your ears alone, it helps to see where the RFI is and where the incoming signal is. They are easy to see if you have a waterfall display on a software-defined radio (SDR) or a pan adapter.

The photograph shows my Jetstream next to my



Verle's Jetstream power supply sits alongside the Icom IC-7300 HF/6m direct sampling transceiver. [W2VJ pic.]

Icom IC-7300 transceiver. There's a line of RFI in the waterfall every 33 kHz on 20 meters.



Spectrum-scope display of IC-7300 shows switch mode power supply harmonics every ~33 kHz. [W2VJ pic.]

Currently, the Jetstream is not in stock at any of the four retailers that I checked. Similar power supplies with noise-offset knobs are the Alinco DM-30TR (20A continuous, 30A surge, as low as \$120) and the Alinco DM-330MVT (30A continuous, 32A surge, as low as \$155). If space is at a premium in your ham shack, consider a switching power supply, but be aware of its shortcomings.



Alinco DM-330MVT power supply.

For more information about switched-mode and linear power supplies, see the ARRL web page at <http://www.arrl.org/your-first-station> and the Wikipedia article at: [https://en.wikipedia.org/wiki/Switched mode power supply](https://en.wikipedia.org/wiki/Switched_mode_power_supply) .

- Verle W2VJ

**[Editor's note:** There are reviews of 12V power supplies complete with emission measurements in *QST* for October 2020, February 2012, July 2006, August 2009 and September 2000. The Alinco DM-430T is reviewed in the October 2020 article, p 39 while the Alinco DM-330MV was praised for its spectral "cleanliness" in September 2000 *QST*, pp 76-77. ]

# New York QSO Party

## Past glories

The New York QSO Party, sponsored by the Rochester DX Association, takes place on the third Saturday in October. For 2020, this date falls on **Saturday October 17<sup>th</sup>**. The contest lasts twelve hours using all modes on HF and VHF/UHF bands.

Last year, PCARA's club entry, organized by Joe, WA2MCR claimed a total of 392 QSOs, for a score of 41,172 points. After official checking, the actual score published in March 2020 gave W2NYW a total of 321 QSOs and 34,354 points. This placed PCARA fourth in the "Multi-One Low Mixed" category. First place went to KX2NY, with 619 QSOs and 93,765 point, earning the Hudson Valley Sysops Association one of the two plaques sponsored by PCARA.

"Multi-One Low Mixed" means: multiple operators with only a single transmitted signal, 5 – 100 watts, mixed mode (CW/Phone/Digital).

The second award sponsored by PCARA was the "Non-New York SSB Low Power"



Previous New York QSO Party plaque sponsored by PCARA.

plaque, and this was won by Josh, K8YLK of Akron, OH with a score of 3,948. The same two plaques will be sponsored by PCARA for 2020.

## Socially distanced NYQP

Because of COVID-19 precautions, PCARA's participation in the 2020 New York State QSO Party will be different from previous years when Joe WA2MCR hosted the event from his sun-room. Instead, PCARA members are invited to take part from their own stations, nominating PCARA for the combined "New York Club high score". Various categories are available to individual stations: Single operator or Mobile, High/Low power or QRP, and CW only - Phone only - Digital only or Mixed mode.

At the time of writing, it is not clear how club members operating from individual stations should indicate their club affiliation, but word is expected nearer the event.

The contest starts at 10:00 a.m. Eastern (1400 GMT) on Saturday October 17 and runs for 12 hours until 10:00 p.m. that same evening. New York stations send signal report plus county, using a three-letter



Verle W2VJ and Joe WA2MCR operating in the 2019 New York State QSO Party from Joe's sun-room.

abbreviation for the county name. Westchester County is WES and Putnam County is PUT. Stations outside New York will send their Signal Report plus State, Province or "DX".

Full rules, including the list of three-letter county codes, can be found at the New York QSO Party web site: <http://nyqp.org/wordpress/>

If you would like to employ the same computer logging software as seen at previous PCARA events, N3FJP's State QSO Party logging programs are available from the following page:

<https://n3fjp.com/stateqsoparty.html> . Registration for the NY State program is \$8.99, or you can register *all* of N3FJP's logging programs for \$49.99.

The N1MM Logger, <https://n1mmwp.hamdocs.com/> can also be used. Set-up instructions are available at the NYQP web site under "Info you can use".

## TX Factor #26

After a long, pandemic pause the latest edition of the *TX Factor* video series about UK amateur radio has been released. Episode 26 includes an interview with *Practical Wireless* VHF columnist Tim Kirby GW4VXE on his recent move to Wales. Presenter Bob McCreadie G0FGX shows how to install a RadioAnalog PTR-7300 adapter into an Icom IC-7300 transceiver, allowing a second, external SDR to tap into the radio's receive line. Finally, G0FGX demonstrates Icom's latest IC-705 portable HF/VHF/UHF direct sampling transceiver.



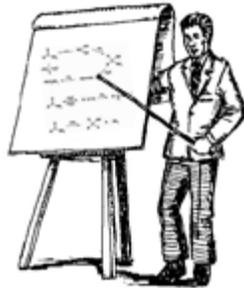
Icom IC-705 demonstration on TX Factor.

*TX Factor* episodes can be found on the Internet at <http://www.txfilms.co.uk/txfactor/> and on the YouTube channel: <https://www.youtube.com/user/txfactorshows> .

# Presenting ideas

## Get the word out

One of the managers I previously worked for used to say that a Research Project was not finished — even though the lab work was done and a report had been written — until the results had been **presented** to the people who mattered. That included business managers who paid for the work and fellow researchers who had to be kept up-to-date.



With PCARA embarking on a Zoom teleconference this month, here are a few thoughts of my own on past methods for presenting ideas.

## Old school

Early memories from school and college — beyond the chalkboard — include the **35mm slide projector** and the **overhead projector**.

Kodak slide projectors, equipped with a carousel, could provide a great visual experience. Photo-



*Kodak Ektagraphic™ III slide projector.*

graphs were easy to include using color slide film but title slides, text, diagrams and formulas all required professional expertise and long turnaround times. There was always the possibility of a slide becoming reversed, inverted or jammed in the gate, stopping the entire presentation.



*3M's 910 overhead projector.*

3M overhead projectors allowed a more “do-it-yourself” approach. The presenter could face the audience while writing onto transparency sheets — usually cellulose acetate — with colored marker pens. Skilled presenters could build up a complex topic by overlaying transparent sheets one on top of another.

In the 1960s, Xerox plain-paper photocopiers became popular, along with special transparency

sheets that could be fed directly into the machine. This allowed printed material and photos to be transferred onto overhead sheets. To prevent foils from melting onto the fuser roller, polyester was used to manufacture the special sheets.

## Presenting the PC

Personal computers arrived in the 1980s and offered more opportunities for do-it-yourself presentations. A **golfball** or **daisywheel** printer could produce high quality output, especially when using a film ribbon. Fonts such as Prestige Elite and Courier were too small for easy reading, but if you changed the face to



*Prestige Elite plastic daisywheel.*

ORATOR, then those tall letters could be read at the

ABCDefgh  
ABCDefgh  
ABCDEFGHIH

*Courier (top), Prestige Elite and Orator fixed-width typefaces.*

back of the room.

With the right software, dot matrix printers could also produce enlarged lettering, suitable for copying onto an overhead transparency.

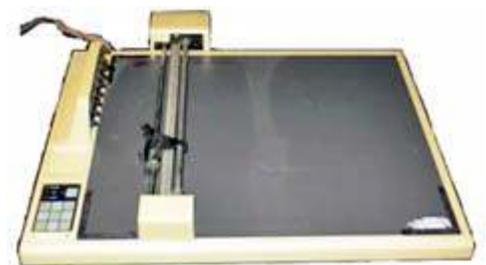
The **HP® LaserJet** printer provided equally good output at high speed, but was expensive. A few fonts were built-in, with additional fonts downloadable or requiring a plug-in cartridge. Scalable fonts would come later.

## Plotting the future

So far, these techniques for text and diagrams were mostly confined to monochrome output. You

could have any color you liked so long as it was black. Then another technology appeared — the **pen plotter**.

In the UK lab, we had a Japanese multi-pen plotter from Watanabe, capable of producing graphs and slides when driven with the appropriate software. Output could be onto paper or transparency sheets. People were fascinated by the rapid action of the plotter as it picked up the appropriate color pen and drew lines and curves on the paper.



*Watanabe MP1000 6-pen color plotter.*

When I moved to the Chicago area in the mid 1980s, the pen plotter was still the best available technology for producing color transparencies, with HP being the favored manufacturer. At the time, PC software for presentations included Harvard Graphics and Lotus Freelance.



HP 7475A plotter with 6-pen carousel and moving paper mechanism.

### Sliding around

For important meetings there was still a demand for 35mm slides, so we acquired an **Agfa ProColor**® film recorder. In the substantial cabinet was a single cathode ray tube, positioned behind a rotating color wheel.

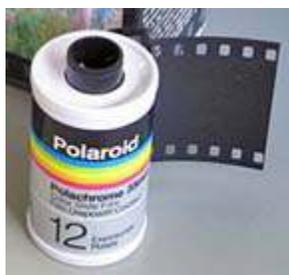


Agfa / Matrix ProColor film recorder.

A Pentax 35mm SLR camera was mounted in front, viewing the CRT face, with remote control of the camera's shutter and film winder.

Exposure times in the film recorder were 3 – 6 minutes per slide as the 2K or 4K resolution picture was built up line-by-line on the monochrome cathode ray tube. The process was repeated for each of the three colors, with the color wheel rotating between exposures. The shutter was then closed and film wound on under control of the attached IBM PC.

For rapid turnaround, we used Polaroid 'Polachrome' 35mm instant slide film, which could be developed in-house and clipped into plastic slide mounts. Polaroid color slides were on the dark side, demanding a powerful projector in a blacked-out room. Much better results were obtained with standard color slide film such as Ektachrome 100 — but this had to be sent out for processing, extending turnaround time.



Polaroid Polachrome color slide film.

A similar film-recorder technique was used in the 1983 movie *WarGames* to generate large screen map displays for the NORAD war room set. Graphics were exposed one frame at a time, one color at a time onto 35mm movie film, which was then developed and projected onto the NORAD set's large display screens. See: <https://www.hp9845.net/9845/software/screenart/wargames/index.php>.



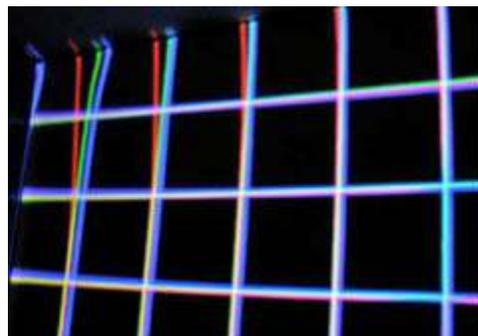
NORAD war room as depicted in the movie *WarGames*, with animated 18 foot display screens.

### Project your image

By 1989-1990 another technology had come along — the **video projector**. We began with an NEC DP-1200 projector — a large, heavy device, fixed to the ceiling in the main auditorium. It had three separate cathode ray tubes for projecting red, green and blue light. Just like color TV sets of the time, it had to be **converged**. This involved selecting a crosshatch test pattern, then using it to align the three CRT beams so their vertical and horizontal lines coincided on-screen. (Convergence of TVs and video projectors is a lost art nowadays, rather like tuning up a vacuum tube PA.)



NEC DP-1200 video projector had three cathode ray tubes and three lenses for red-green-blue output at VGA resolution.



Red, green and blue light from the three CRTs had to be converged so the lines coincide at the center and outer edges of the screen.

Not only did early CRT projectors have to be re-converged at regular intervals, but their light output was

low, requiring a fully darkened room in order to see the screen. Even so, the convenience of sending live pictures from an attached PC to the projector was a big step forward for software demonstrations and computer training. A video-cassette recorder could also be attached to show training videos on the large screen.

### Phasers on stun

When I moved from Illinois to NY State, the NEC projector came along for the ride and was remounted in the new auditorium.

In the other meeting rooms, 3M overhead projectors were still in use and there was a continuing demand for color transparency sheets.

A new technique was introduced in 1993 with the Tektronix Phaser™ 200i color thermal transfer printer — this used a thermal head to transfer colored wax from a three-color roll onto coated paper or onto clear transparency sheets.



*Tektronix Phaser 200i thermal wax transfer printer.*

The technique could transfer large areas of solid color, producing foils with vivid backgrounds that looked stunning compared with earlier techniques.



*3-color transfer roll.*

The 3-color transfer rolls — featuring sequential bands of yellow, cyan and magenta — were expensive and wasteful, but the printing process was fast compared with pen plotters and film recorders. I remember one of our last-minute colleagues popping out of a meeting to see whether foils for his looming presentation were ready yet.

By 1996 we were upgrading to **Phaser 340** printers from Tektronix. Instead of transferring wax from a three-color film, the new technique employed **solid ink jet printing** with drum-based off-set.

The phase-change ink was supplied in individual colored-sticks which had to be loaded into the machine. Each color of ink (cyan, magenta, yellow and black) came in a dis-



*Tektronix Phaser 340 color printer.*

tinctive shape so that (in theory) it was difficult to load a color into the wrong slot. But that didn't make it foolproof. Maintenance of these Tektronix color printers was quite expensive, especially when components had to be replaced.



*Tektronix Colorstix solid ink for Phaser 340.*

### More lasers

By 2000, HP LaserJet printers had been improving to the point where **Color LaserJets** became economical. They were large machines that had to accommodate four separate toner cartridges (cyan, magenta, yellow, black) but they produced good-looking output on paper and could easily be networked. Unfortunately, printing on transparencies was less satisfactory because the colored toner was insufficiently transparent.

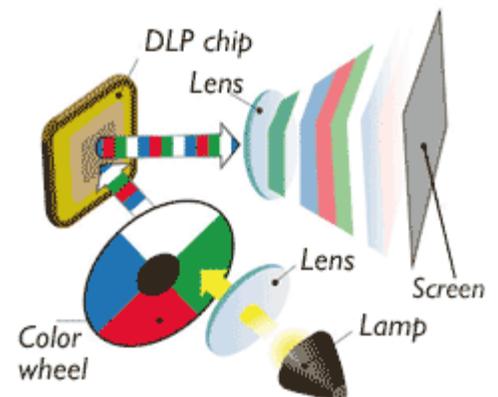


*HP Color LaserJet 4500.*

By this stage, PC software for presentations had moved away from Lotus Freelance toward Microsoft PowerPoint. And another projection technology was waiting in the wings...

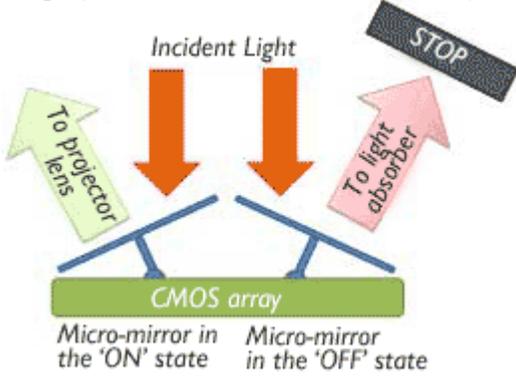
### Shine a light

Old-style video projectors were large and heavy, with low light output and a requirement to keep the cathode ray tubes converged. A new generation of video projector replaced the cathode ray tubes with a discharge lamp, a rotating color wheel and a Texas Instruments DLP® (digital light processing) device to generate the image. The result was a smaller unit with sufficient output to be viewed in a lighted room.



*Diagram of a video projector with DLP® technology. Some viewers see flashes of individual colors due to the rotating color wheel. [After Epson.]*

The digital micromirror device (DMD) in a DLP projector consists of an array of tiny reflective aluminum micro-mirrors built on top of an array of CMOS memory cells.



Digital micromirror device. Each mirror is deflected depending on the state of the CMOS memory cell located underneath.

Our first excursion into this technology began in 1998 with a Proxima Ultralight DS1 projector that could be carried into conference rooms. It was followed by a larger Proxima Pro AV DP9300 that was permanently installed in the auditorium.



*Proxima Ultralight DS1 video projector employed TI's DLP technology, with SVGA (800 x 600) resolution.*

We subsequently switched to projectors from InFocus Corporation — which had acquired Proxima.

InFocus projectors were smaller and lighter, with improved resolution.



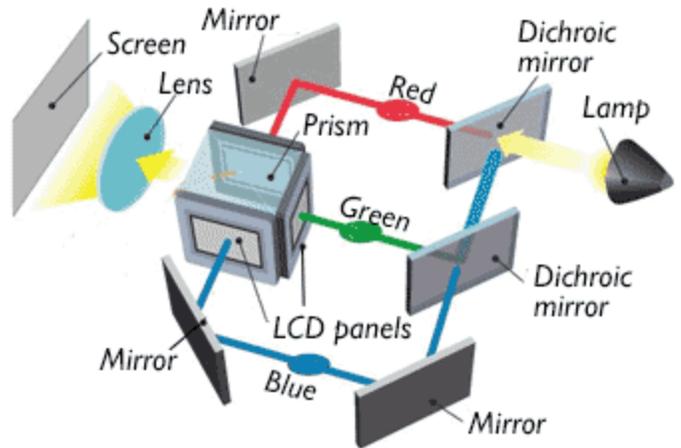
*InFocus LP350 was a smaller, portable video projector with XGA resolution.*

Heavily-used meeting rooms had their own projector mounted in the ceiling, but we also had portable units for use in other locations, plus an older projector for offsite employee activities — including PCARA meetings. The 'UHP' high pressure mercury discharge lamps in these projectors ran hot and had to be cooled off after use by leaving the fan running for several minutes. Lamps had a finite life and were expensive to replace — around \$300 to \$500 each.

DLP technology is also used in modern cinemas, replacing the 35mm film projectors that have been a mainstay of the industry since Edison first exhibited moving pictures in 1896.

## Modern times

35mm slide projectors and overhead projectors are now part of history as the video projector became the preferred presentation device in classroom and conference center. Early DLP projectors from 1996 were priced between \$5,000 and \$13,000 but the cost has steadily fallen to around one tenth of that amount. For example, an Epson EX5260 projector with XGA (1024 x 768) resolution, "3-Chip LCD" (3LCD) technology and 3,600 lumens from a 210 W ultra-high efficiency discharge lamp costs around \$550.



*Epson 3-LCD technology substitutes three separate LCD panels in place of the single DLP device and color wheel, removing the DLP color flashes. [After Epson.]*

Less expensive projectors are also available — they employ an LED light source in place of the high intensity discharge tube. Light output is not so high, but should be sufficient for a darkened room.

The price of flat-screen TV sets has also been falling — for example a 65" 4K TV set might cost around \$530.00 today. Though not as portable as a small video projector,

these sets can be mounted on the wall of a conference room and produce high quality pictures when connected to the HDMI port of a notebook PC — as in PCARA's recent meetings at the Cortlandt Town Center 'CUE' room.



*Masa JR1AQN presented "Getting Started with FT8" on a flat screen monitor at the Cortlandt CUE Room in November 2019.*

# Restoration of a Classic

## -The Drake C Line - N2CBH

Recently I came into possession of a classic radio transmitter, receiver, power supply and amplifier made by the R.L. Drake Company of Miamisburg, Ohio. Drake, long a maker of ham radio equipment, produced some really great radios in the late 1950's starting with the model 1A receiver in 1959. At the time they had formidable competition from the likes of Collins, Hallicrafters and National.

Drake had to be a cut above the rest — and in many respects they were. They brought PTO (permeability tuned oscillator) tuning to the masses at a lower price than Collins — and a more modern and compact look to their line of radios than Hallicrafters or National. The term “boat anchor” is used to describe a lot of this old stuff but somehow that moniker doesn't fit Drake. Just look at the Drake 2B — a classic receiver with a modern look for 1961 when introduced. A



Drake 2B receiver covered 80 - 10 meter bands, SSB, CW and AM.

similar offering from National was more than twice the size and didn't perform as well.

Here is the inventory I received: a Drake T-X4C transmitter with MS-4 speaker/power supply and companion R-4C receiver. Also included was an L-4B legal limit amplifier. One more important item was a complete set of original manuals for everything. There was even an original Drake sales flyer with a Harrison Radio sticker on it tucked into one of the manuals.



Bob's Drake inventory, L to R: L-4PS Power Supply, L-4B amplifier; MS-4 speaker with AC-4 power supply, T-4XC transmitter and R-4C receiver. [N2CBH pics.]

### Crystal mixing

The TX and RX pair are capable of 1.8 – 30.0 MHz operation in multiple band segments and in fact can be made to work anywhere in that frequency range with selection of proper premix crystals. 1.8 - 2.0 MHz operation was optional so the stock setup could only operate from 3.5 – 30.0 MHz. Mine came with several

optional crystals for out-of-ham band receiving. One allowed 9.5 - 10 MHz and another 4.5 - 5.0 MHz operation. 5.0 - 6.0 MHz is the only segment not possible as it is in the same frequency range as the PTO. The two crystals supplied in this rig were commonly ordered as it allowed the user to tune in WWV on 5 and 10 MHz for dial calibration purposes. Nowadays you don't have to worry about that as most transceivers tune from ~60 kHz up to many tens of MHz. Back then you needed to think about how you were going to operate a radio and order crystals accordingly.

### Frequency control

This Drake pair is designed to be able to work as a separate transmitter and receiver for “split” or (in Drake terminology) separate operation — so there is a PTO (=VFO) in both transmitter and receiver. A switch allows the selection of separate, transmitter, or receiver PTO. When selecting either transmitter or receiver PTO the unit operates in transceive mode with either the TX or RX PTO being used to simultaneously tune the transmit and receive frequencies, just as modern transceivers do.

RIT is accomplished using split mode and tuning the receive VFO to match the incoming signal pitch for CW or SSB. Calibration of the two dials is required, which is done by setting the dial of the receiver to a known harmonic of the calibration oscillator and then tuning to that frequency to zero beat it. Then you throw the multi-function switch to the spot position and zero beat the TX PTO. Once that is done, if there is a discrepancy between the two dials you can “slip” the TX PTO dial to match the receiver. The mechanical operation of the PTO dial is through a series of plastic gears and friction of the outer dial knob and the “slip” knob. To slip it in you hold the main tuning dial while adjusting the inner dial ring that is attached to the display dial — which moves it to the correct position so that it is in sync with the transmitter dial. Sounds like a lot of work? Well that is part of the fun of operating an old rig like this.



Drake main tuning control and tuning dial. Main tuning knob can be held stationary while adjusting the skirt.

### Tuning up

We aren't done though. To get the transmitter tuned up for maximum output you have to select the

band of operation, tune the preselector, then adjust the plate tuning for a dip of plate current and then peak the plate loading for maximum output. One more step. You need to peak the receiver preselector for maximum noise in the speaker which insures the receiver has maximum sensitivity. OK now you are ready to go on that frequency. Want to change frequencies? Do it all over again! A little more on operation in a bit.

### Back story

When I received this equipment it was hand delivered by David KD2EVI. David's brother had a friend who had been a ham and wanted to sell the gear after not using it for many years. I made an offer, it was accepted and David got the job of picking up the radios from Long Island then transporting them to their new QTH. Thanks David!

When David brought these items over, we anxiously turned the gear on after I had warmed them up on a Variac®. A device used to vary the incoming AC voltage, a Variac is a very handy thing to have when starting up old equipment. Both transmitter and



Variac with variable output of 0 - 130V AC available.

receiver have linear power supplies with large electrolytic capacitors. After many years of disuse these capacitors can dry out or become deformed and then fail in a spectacular way if they are jolted back into action with full voltages applied.

One way to make sure there are little if any “fireworks” is to bring a radio up slowly on a Variac. After doing so we turned on the receiver and it did indeed light up and the speaker produced some noise. That was about it! After inspecting carefully on the bench with covers removed the first thing that I did was to apply a liberal amount of DeoxIT™ spray to the band switches and to some other wafer switches in the receiver. After that I connected the receiver to an antenna and the radio actually showed some signs of life. I was able to hear some signals!

After a more thorough cleaning I decided to perform a better check of the receiver sensitivity and found that after peaking up on each band the radio actually met specification for receive sensitivity on all bands except 80 meters — which did not work at all. Some troubleshooting over a few nights revealed a bad crystal for the 80 meter position.

### Mixing it up

Drake used a **premix** system to obtain the local oscillator frequency. The PTO always generates 4.955 to 5.455 MHz. One of a set of crystals is then used to mix with the PTO, with output applied to the receive mixer where it is mixed with the incoming signal to generate the first IF frequency.

When I switched the radio to the 80 meter position there were signals being received but they were on the wrong frequencies! With no crystal frequency to pre-mix with the PTO, the receive mixer simply mixed the PTO output with incoming signals from the antenna and produced output on short wave frequencies in the 11 MHz region.

Here's how it works. On 80 meters the pre-mix crystal is on 14.600 MHz. If the PTO is set to 5.200 MHz, that is subtracted from 14.600 MHz, generating 9.400 MHz. This is mixed with an incoming signal on 3.755 MHz to produce the first IF of 5.645 MHz.

$14.6 - 5.2 - 5.645 = 3.755$  the incoming receiver frequency.

### Crystal palace

I needed to obtain a new 14.6 MHz crystal — not an easy task these days. One of the few companies doing this is **Bomar Crystal** in New Jersey. Crystals used to be available for \$10.00 to \$20.00 apiece. Now the crystal needed for this radio is 75 bucks!

I have to thank Malcolm NM9J for cluing me in to something about crystal behavior. I had discussed this with him and he told me of an experience he had with reviving a dead crystal by cooking it at low heat or using a bit of mechanical shock to “dust off” material that may have grown on the crystal substance itself over time. A discovery here was that indeed the crystal that had been bad actually came back to life by being heated in the radio and I suspect being handled a bit as I had removed and replaced it several times. I had ordered a new crystal and installed it but out of curiosity I put the old crystal back in — and it was now working! An expensive lesson on my part, I guess. I figured since I bought a new crystal I might as well use it.

### Dial a signal

One more critical repair had to be taken care of. The mechanical dial system needed to be cleaned and lubricated. The vernier system uses a series of plastic gears, possibly nylon, which were very sticky — so a thorough cleaning and re-lubrication were needed.

Cleaning, lubrication, and readjustment of the dial indicators was completed and the receiver was almost ready to go. I checked calibration of the S-meter next. S9 should be indicated when 50  $\mu$ V of signal is presented to the antenna terminals and the set was perfectly in calibration on all bands after nearly 50 years! To check this I used my commercial IFR service

monitor that has a calibrated signal generator.

The power supply was even in good shape. No hum or ripple on the power supply with electrolytic capacitors nearly 50 years old!



*Drake R-4C receiver after restoration by Bob. [N2CBH pic.]*

### **Transmit time**

Now on to the transmitter. I was able to clean up the band switch arrangement in a similar manner that I used in the receiver but the transmitter would need more work. Placing a wattmeter and dummy load on the output, the transmitter was a little low on output on all bands and did not work at all on 20 meters. I followed the tune up procedure in the manual and was able to raise the transmitter to full output on all bands except 20 meters. Hmm, what was wrong with 20m?

Drake used the exact same scheme of premixing the PTO with a series of crystals to obtain the desired transmit frequency — and guess what? I had another bad crystal, this time for 20 meters. I had decided to only order the crystal I needed for the receiver because I wanted to make sure Bomar could make a crystal that was going to work. Once I received and installed a working crystal in the receiver I could then order the needed crystal for the transmitter. Well, that strategy worked even better than I thought because as it turns out I never needed the 20 meter crystal. Remember



*T-4XC transmitter after restoration by Bob. [N2CBH pic.]*

what Malcolm taught me about crystal management? Well it worked on the 20 meter crystal as I was able to get it to resonate on its intended frequency simply by “cooking” it in the transmitter — by leaving the equipment running overnight in standby mode. Thanks Malcolm!

Once I had a working transmitter and receiver, putting it all together was simply a matter of interconnecting a series of RCA cables between receiver and transmitter. I tuned up the transmitter, peaked the receiver into an antenna and I was all set. My first QSO was Jerry WA2ZOA over in Connecticut on 75 meter SSB. He gave me a good signal report but noted the audio sounded a little thin. I was using an Astatic D-104 crystal microphone which has notable two-way radio quality output, lacking low frequency content — which is by design. These microphones were designed to produce a rising response peaked at 3 kHz. Modern dynamic and electret microphone technology produces better fidelity but that’s OK as this was the standard setup of the era in which these radios were produced.

I have had several other QSO's with the rigs and they are performing well. I have a regular sked on 75 meters on Tuesday nights and I have used the rig for two of these skeds so far. Operation has been flawless. I have yet to plug a key in and try the radios on CW but will do that soon. Speaking of CW, the R-4C had optional CW crystal filters available but there were none in this receiver. Two standard filters are supplied, a 6 kHz wide AM filter and a 2.4 kHz SSB filter, also used for CW operation. The receiver has pass band tuning that is marked RTTY/LSB/USB.

I am really in awe of the design and build quality of these radios and how they continue to stand up even to today’s operating environment. These radios are considered Spartan compared to what can be had today in a transceiver — but a skilled operator can still use these radios effectively even in harsh conditions. Two things stand out for me about the design of this equipment. The receiver front end with its superb preselector and stability of the permeability tuned PTO make the receiver a really good performer. The front end is vacuum tube technology while the PTO is solid state. Warm-up drift is 100 Hertz or less after 1 half hour of operation and once heated remains very stable. Operation is a pleasure because you have to interact with this radio to get the best performance out of it. You become one with the machine, something mankind has a unique experience of. It’s like holding a favorite tool with a handle worn to your hand. Yes, a radio can become more than an inanimate object in the hands of a skilled operator. A true joy of the hobby for me.

Next time I will try and have some news on the L-4B amplifier. The complete Drake station. Thanks for sharing this trip back to the 1970's!

- 73 de Bob N2CBH

# KWO-35 Returns! - N2KZ

After over seven years of technical troubles and lease negotiations, New York City's National Weather Service station KWO-35 is finally back on the air with a permanent facility at full power. Broadcasting 24 hours a day on 162.550 MHz from The Empire State Building at 1000 watts, it can now be heard with a listening radius of 40 miles or more serving 18.5 million people in New York, New Jersey and Connecticut. Two antennae are being



KWO-35 coverage map.

utilized mounted on the northwest and southeast corners of the building producing a more powerful signal than ever before. Our congratulations to The National Weather Service in restoring this essential service to the New York metropolitan area.

This is the latest chapter in a story that began around July of 2013. The United States Coast Guard Emergency Channel 16 at 156.800 MHz had been suffering strong intermittent interference from an unknown source. After exhaustive study, it was determined that this was a case of RITOE: Receiver Induced Third Order Intermodulation Effect. KWO-35 broadcasts on 162.550 MHz. Channel 16 is below KWO-35 on 156.800 MHz. Subtract these two frequencies and you will find them to be 5.750 MHz apart.

A powerful governmental transmitter for the Federal Bureau of Investigation, using the digital P25 format, also transmits from mid-Manhattan on 168.300 MHz — exactly 5.750 MHz above the KWO-35 frequency. When the FBI went on the air, their signal mixed with the weather radio signal creating an RF product. Mix this product with the KWO-35 signal and you will be exactly on marine Channel 16. See if you can follow the math: 168.300 MHz (FBI) minus 162.550 MHz (Weather) is 5.750 MHz (RF product.) 162.550 MHz (Weather) minus 5.750 MHz (RF product) is 156.800 MHz (Marine Emergency 16.) When the FBI and weather broadcasts combined, a strong carrier jammed the Coast Guard's most important emergency calling frequency. In simple terms, it was a mess!

Needless to say, KWO-35 was pulled off the air until a solution could be found. In October of 2013, notch filters were installed and evaluated on both the KWO-35 and FBI installations to no avail. KWO-35 was

moved to temporary transmission sites using low power but these trials proved insufficient to provide long-term coverage. Troubles multiplied when The National Weather Service had difficulty finding a new cost-effective real estate lease to house the transmitting equipment and mount a proper antenna to restore a permanent full power signal to its large coverage area. Now that the weather broadcasts have moved across town to The Empire State Building, the FBI and KWO-35 transmitters are sufficiently distant from each other, ending the signal combining problems that disrupted the Coast Guard's emergency frequency. We are all thankful that this dilemma has come to a conclusion!

Take full advantage of the All-Hazards alert system provided by NOAA weather radio stations nationwide. You can receive instantaneous alerts over-the-air "to protect life and property" using specially fitted radios. Details of this system can be found at: <https://www.weather.gov/nwr/nwrsame>.

KWO-35 is one of the oldest weather broadcasting stations in the United States. It originally went on the air in 1955 as "VHF Radio Weather" broadcasting primarily aviation weather from the Whitehall Building at 17 Battery Place in New York City. In 1960, the National Weather Service moved to a new facility at 30 Rockefeller Plaza in midtown Manhattan. A large RADAR radome and multi-antenna system was installed atop the skyscraper as part of their new first-class state-of-the-art weather station. In turn, KWO-35 gained a powerful signal to serve the metro area.



KWO-35 antennas and radome on RCA Building in 1961.

In 1995, The National Weather Service moved their New York City area offices to their current location in Suffolk County, Long Island at Upton, NY.

Continual weather broadcasts are produced in Upton for four NOAA weather radio stations: KWO-35 162.550 Manhattan, WXM-80 162.475 Riverhead, WXJ-42 162.400 Meriden, CT and KHB-47 162.550 Montville, NJ. Now in the year 2020, KWO-35 broadcasts have risen to new heights atop The Empire State Building. Enjoy!

- Karl, N2KZ

# Peekskill / Cortlandt Amateur Radio Association

**Mail:** PCARA, PO Box 146, Crompond, NY 10517

**E-Mail:** mail 'at' pcara.org

**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 are required.

No monthly meeting in October.

**Sat Oct 17:** PCARA Breakfast, 9:00 a.m., Downing Park Pavilion, Rt 202, Yorktown.

**Sat Oct 17:** New York State QSO Party, 10 a.m. - 10 p.m. individual stations.

**Wed Oct 21:** "Magic of Amateur Radio", 8:00 p.m. Virtual Presentation using Zoom, introducing Amateur Radio. Q&A.

**Sat Nov 7:** PCARA monthly meeting, 9:00 a.m. John C. Hart Library porch.

**Sat Nov 7:** PCARA V.E. Test Session, 11:00 a.m. John C. Hart Library porch.

## Hamfests

**Most local Hamfests scheduled for fall 2020 have been canceled. Check with organizers before leaving.**

**Sat Oct 17:** Harrisburg RAC Oktoberfest, Vietnam Veterans of America, 8000 Derry ST., Harrisburg PA. 7:00 a.m.

## VE Test Sessions

Many fall VE Test Sessions have been canceled.

**Oct 7:** Orange County ARC, Algonquin Park 52 Powder Mill Rd Newburgh NY. 11:00 a.m. Must contact Joseph J. DeLorenzo W2BCC, (845) 534-3146.

**Oct 20:** Orange County ARC, Munger Cottage, 183 Main Street, Cornwall NY. 6:00 p.m. Must Contact Joseph J. DeLorenzo W2BCC (845) 534-3146.

**Nov 7:** PCARA, John C. Hart Library porch, 1130 E Main St, Shrub Oak, NY. 11:00 a.m. Must contact Michael Dvorozniak W2IG, w2igg'at'yahoo.com, (914) 488-9196.



Peekskill / Cortlandt Amateur Radio Association Inc.  
PO Box 146  
Crompond, NY 10517