PCARA Update

Volume 18, Issue 12 Peekskill/Cortlandt Amateur Radio Association Inc. December 2017

Noses on the air

PCARA has reached new heights — literally! On the chilly morning of Saturday November 11, 2017, Lou KD2ITZ and Mike W2IGG ascended **Anthony's Nose** in the Hudson Highlands at the East end of the Bear Mountain Bridge to set up and operate from the summit. Operations were held on the 146.670 MHz repeater, and a Simplex Challenge was conducted on 146.565 MHz. Further contacts were made on both 20 meters and 40 meters SSB. Details follow in this month's edition of the *PCARA Update*. Well done Lou and Mike! *[Report begins on page 5, -Ed.]*

Another very successful and well attended **PCARA Breakfast** was held at 9:00 a.m. on November 11, 2017 at Turco's in Yorktown Heights, NY. A couple of awards were given out — the first to Lovji N2CKD for his Second Place finish in the most recent September PCARA Foxhunt. Congratulations Lovji! A second award in the form of a plaque was presented to Barry K2BLB for his support for the Workshops and assistance in helping to locate a home for the 448.725 MHz repeater. Congratulations Barry and thanks again!

The breakfast was also attended by two fellow Hams as a result of the Anthony's Nose expedition. Todd, N2MUZ met Lou and Mike on Anthony's Nose during his hike to the peak, and Jay NE2Q worked them on 2 meters. Hopefully we'll have two new PCARA members soon! The next PCARA Breakfast is scheduled for 9:00 am on Saturday December 16 at Turco's in Yorktown Heights, NY. Please try to join us.

Greg KB2CQE (left) presents Barry K2BLB with the "Radio Amateur Operator of the Year" plaque for his 2017 efforts.

Our next meeting will take place during the **Annual PCARA Holiday Dinner** at 5:00 p.m. on Sunday December 3, 2017, at the Cortlandt Colonial Manor Restaurant in Cortlandt Manor, NY. A menu containing the available fare can be found on page 12 of this month's edition of the *PCARA Update*. The cost is $40.00 per person, which includes gratuity and tax. For desert we will be having a chocolate mousse cake! As always, ALL ARE WELCOME! Please come join us in celebrating the Joy of the Holiday Season.

For those who might be interested, **Ham Radio University** is on Saturday January 6, 2018 at LIU / Post, Hillwood Commons Student Center, 720 Northern Boulevard, Brookville, NY 11548. Doors open at 7:30 a.m. with the first forums starting at 8:30 a.m. For more information please visit: http://hamradiouniversity.org. Road trip anyone?

We will begin 2018 with another annual tradition, the **PCARA Bring and Buy Auction** on January 7, 2018 at 3:00 p.m. at New York-Presbyterian / Hudson Valley Hospital. Start digging through your shack now to try and find anything you might no longer need and bring it along to the meeting. Please invite any of your fellow Ham friends to join us! I look forward to seeing each of you there.

- 73 de Greg, KB2CQE

Contents

PCARA Officers

President:
Greg Appleyard, KB2CQE; kb2cqe at arrl.net
Vice President:
Joe Calabrese, WA2MCR; wa2mcr at arrl.net

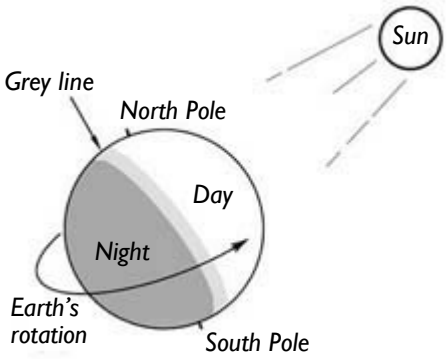
Adventures in DXing

- N2KZ

Do You Hear What I Hear?

Listening carefully to AM broadcast radio can teach you great lessons about low band propagation. You probably know what to expect during the majority of daytime or nighttime hours... but have you ever followed the **grey line**?

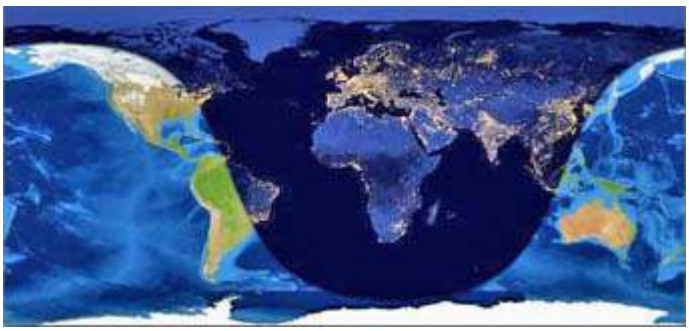
Radio propagation is often enhanced during local sunrises and sunsets. You might think there is a natural radio spotlight that follows the sun, as the sky turns from dark to light or light to dark. Want to maximize your catches on 40, 80 or 160 meters? Take advantage of this effect to work all those places that are in between usual daytime local reception and long skip you know well at night.



The grey line is the transition region between daytime and night. MUFs are rising rapidly on the sunrise side of the earth and are still high on the sunset side. The D layer has not yet been energized on the sunrise side, and is rapidly dissipating on the sunset side, resulting in low MF and HF absorption.

AM radio stations make terrific grey line propagation indicators. After all, the 160 meter amateur band is just above the edge of AM broadcasting on 1700 kHz. Just like beacon transmitters, AM radio stations are always on. Broadcasting lots of local ads and content during 'drive time' commuting hours, these stations should be fairly easy to identify. Pick a frequency, unused by local stations, in the high end of the AM band and sit back and listen carefully. The grey line will surely come and bring you interesting reception for a couple of hours before it is done!

The wave of the grey line is often quite predictable. Take a look at a map and you will see what I mean! See: http://dx.qsl.net/propagation/greyline.html for the current situation. Here in the New York City area, grey line begins by highlighting the Canadian maritime provinces and works its way down to Maine, New Hampshire, Massachusetts and upstate New York. Later on, it will fan out to the south to enhance stations from Pennsylvania, Maryland, Virginia and points south. Also expect to hear areas to the west like Ohio and Michigan.



Grey line map.

Act fast! The openings may only last a few minutes. The strength of signals may completely amaze you! One valuable tip: Your best reception will occur during times when you and your target are both on the edge of the grey line. My CW student and good friend, Gil, NN4CW, lives in Savannah, Georgia. We used to sked day after day at dawn using grey line to promote our signals back and forth. Both of us were using QRP power, yet our signals always pulled through... all because of grey line enhancement.

Grey line for December 1 at 5:00 p.m. EST (22:00 UTC) shows night falling over the Americas. [From http://www.fourmilab.ch/].

Please remember that grey line reception is not limited to just a few hundred miles up and down our eastern seaboard. Examine a grey line map and you will see that while we are ripe for grey line mode at dusk, dawn is breaking thousands of miles away in the Middle East or Asia. It's grey line time there, too.

Grey line for June 23 at 8:00 p.m. EST (01:00 UTC) shows dawn breaking over Asia and Middle East. [http://www.fourmilab.ch/]

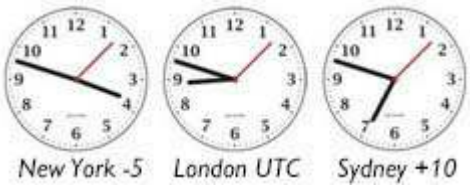
One classic AM radio DX catch is the powerful signal from Saudi Arabia on 1521 kHz. Because of its frequency offset, the Saudi signal will create a one kilohertz heterodyne with domestic stations on 1520 kHz like Buffalo, New York's WWKB. If you hear an endless tone listening to 1520, it's very likely that you are pulling in Saudi Arabia!

WWKB, Buffalo NY logo.

Again, remember that you *can* take it with you. If you are in your car commuting, you can hear some great grey line skip on AM radio. Get to know and appreciate this terrific propagation mode. Tune in and experiment and see what you can log! Take these new skills and experiences and apply them to low band amateur radio DXing. You will find the very same grey line effects waiting for you on the low bands. What fun!

Grey line DXing is only one of many, many natural characteristics you can use to fill your logbook. There are endless theories you can use to maximize your catches. One method I find very useful could be called Jimmy Buffett DX. His famous song 'It's Five O'Clock Somewhere' might have been written for hams. This concept is not based on natural phenomena. It is based on human behavior and routines. When do most humans have spare time to operate? After work and after dinner! Look for stations from India in late mornings. Evenings in Mumbai occur from 7:30 to 10:30 a.m. Eastern.

Anyone who hangs out on the 30 meter CW band witnesses this effect almost daily. Nearly every afternoon, many stations from Europe can be found on 30 meters. When it is 6 to 9 p.m. in Prague in the Czech Republic, it is noon to 3:00 p.m. in New York. This also explains why you can hear Australians and New Zealanders during our dawn. 2:00 to 5:00 a.m. Eastern is dinnertime in Sydney. Wait a minute, Karl... This might also be a period of mutual grey line! Double score!



Many hams and shortwave listeners often bank on the concept of mutual darkness. It never hurts to have a path of darkness between two sites to connect, especially on the low bands. Their motto: "Meet me at midnight!" Spending decades as an AM radio DXer, I couldn't agree more! The only time I could ever, ever catch the signals of 50,000 watt KFI on 640 kHz from Los Angeles was around 2:30 a.m. Eastern. A similar catch came at just about midnight when I heard KNIX (now KQFN) 1580 Tempe, Arizona. Just this morning, I heard WDNC 620 Durham, North Carolina barreling over local WSNR in Jersey City. Not bad for 41 watts non-directional!

Tim Conway Jr. hosts an evening talk show weeknights on west-coast broadcast powerhouse KFI, 640 kHz AM.

If you need to research AM radio catches, try these two databases: The FCC's AM Query page at: https://www.fcc.gov/media/radio/am-query and Radio Locator at: https://radio-locator.com. Both of these sites are wonderful resources when you want to discover what you have heard. Of course, you can always try the radio station's direct web site, too. Make it your New Year's resolution to try some new propagation modes in 2018!

What's New?

Actually, quite a lot! The 'repacking' of TV channels has started. Over the past few months, broadcasters were offered large sums of money to abandon their TV channels through public auctions. Wireless communications vendors like AT&T, T-mobile and Verizon are anxious to gain more spectrum space to expand their ever-growing businesses. Some of the auction results were astonishing. WNBC and local broadcaster WRNN were both offered over $20 million to leave their UHF frequencies. Spectrum space is finite and precious... and valuable!

Following an incentive auction conducted by the FCC in 2016-2017, ***repacking*** *of digital television channels is now underway. The FCC's intention is to free up RF spectrum above UHF TV channel 36.*

In turn, WNBC has just begun testing sharing another transmitter with co-owned Telemundo affiliate WNJU. Broadcasting from One World Trade Center in downtown Manhattan, this new (and

more powerful) WNBC broadcast appears as virtual channel 4-3 when you re-scan your TV to find new stations. You can still also see NBC New York on channel 4-1 (RF channel 28) from The Empire State Building during this transition. Similarly, PBS affiliate WNET has taken on the programming previously seen on a low power TV station WMBQ-CD formerly on RF channel 46. You'll now find WMBQ's 'BIZ TV' on channel 13-3 next to WNET's primary broadcast on 13-1 and PBS Kids on 13-2.

Digital TV repacking in NYC has commenced. WNJU on physical channel 36 now carries WNBC programming on virtual channels 4-3 and 4-4 as well as Telemundo programming on virtual 47-1 and 47-2. [N2KZ pic.]

The TV re-shuffle will be extensive. Soon-to-be abandoned television channels above 36 will be re-allocated to host various types of high-tech data transmissions. At the end of the repack, the New York metropolitan area will be served by 18 TV transmitters all feeding multiple channels with free over-the-air programming. Someday in the future, a new TV standard called ATSC 3 will allow broadcasters to use their frequencies to distribute data in a multitude of ways. It will deliver a lot more than just television. Stay tuned!

Delivery of both radio and television reached a new maturity during the year 2017. Digital radio is now heard easily on smartphones, car radio applications and Internet radios, bringing stations to your ears in high fidelity stereo from around the world. On-demand television and audio podcasts also vie for your attention via smartphones and various players and computers. I predict that 24/7 continuous channels of programming might very well be abandoned in favor of VOD - video on demand. We will see!

Continue the Tradition

New Year's is a great time to celebrate and bring in the new. Start the year off with a 'beep' during ARRL's Straight Key Night. Listen in and join our party of slow and graceful CW often transmitted on vintage gear all around the world on this special night. SKN began 48 years ago, first organized by Harvey Savage, K4MD back in 1970. An annual celebration spanning almost five decades, it has matured into a warm and friendly annual gathering of all who enjoy the sound of Morse Code from long ago. Tube rigs will be glowing in hundreds of shacks nationwide!

On Straight Key Night, vintage tube rigs will be glowing in hundreds of shacks. [N2KZ pic.]

It is easy to participate. All you have to do is transmit some code at any speed you like using a straight key. No electronic keyers or keyboards allowed! SKN is a welcome opportunity for everyone to *try* code because no one is sending fast and slow coders blend in so well with everyone else. Many, many hams appear on CW who you'll never hear during the rest of the year. You are bound to meet good old friends, too. The event runs from 7:00 p.m. New Year's Eve and all day New Year's Day until 7:00 p.m. the next night. Tune in and enjoy!

If you take part in SKN, you will hear Morse Code generated by human fists, transmitted more often than not from warm vacuum tubes like those in Karl's HW-16 transceiver. [N2KZ pic.]

Happy Holidays and Happy New Year! 73 de N2KZ 'The Old Goat' dit dit.

PCARA Hike Nov 2017 - KD2ITZ

Records were shattered on Saturday November 11, 2017. A high pressure system from Canada brought historic low temperatures to the Hudson Valley with Peekskill reaching a chilly 22°F. Despite the conditions, Mike W2IGG and Lou KD2ITZ set off on the PCARA Hike, as scheduled, at 8:30 a.m. Dressed appropriately, they described the weather as pleasant given the bright sunshine and low wind speed. The 1.3 mile ascent from the North Trailhead to the summit of **Anthony's Nose** (900 feet above sea level) took approximately 40 minutes including breaks for checking in to the W2NYW repeater. The first order of business was to admire the glorious view of the river from several perspectives. Local hikers agree that the most scenic views can be found near "the flagpole." The spot offers miles of visibility, a bird's eye view of the Bear Mountain Bridge, and the proud colors of the American flag. A flag has flown here for years in honor of a fallen hero. The tribute was especially poignant on Veteran's Day, November 11th, and PCARA salutes all the present and former members of our country's Armed Forces.

The Flagpole at the summit of Anthony's Nose is a popular destination for hikers because of the great views. [KD2ITZ pic]

In 1935, well before the makeshift flagpole was placed at the top of Anthony's Nose, a large steel **Bilby Tower** was temporarily constructed for surveying the terrain. All that remains now are concrete footings and metal brackets bolted to the granite outcropping. These items are not merely of historical interest to hams, as they can still be used to support antennas. Mike's fiberglass mast was fastened to an old bracket and the nearby trees were used to tie guy lines and the ends of the antenna elements. Battered by strong winds and growing in a thin layer of soil, the trees were actually shorter than the 32 foot portable mast. These trees, however, obstruct the scenic river vista and the area around the old tower site was of little interest to passing hikers. The combination of low foot traffic,

This hardware likely held guy wires for the Bilby Tower, which was located about 20 yards away. The W2IGG antenna mast was affixed to this bracket. [KD2ITZ pic.]

high altitude, and steady antenna support made this the ideal location for the W2IGG portable station.

Amazingly the entire station weighed less than 14.5 pounds. The radio consisted of a Yaesu FT-857d, which including the microphone, cables, and a foam enclosure, weighed 4.8 pounds. A single lithium iron phosphate ($LiFePO_4$) battery, rated at 4.6Ah and weighing 2 pounds, was sufficient to run the rig at its maximum output power of 100W HF and 50W VHF. The battery was replaced only once. The appropriately named Packtenna system (http://packtenna.com/) weighed only 2.7 pounds including: the antenna wire, balun, and 50 feet of coaxial cable. The proprietary 1:1 balun was attached to the mast at a height of 22 feet. Two quarter wave 40 meter dipole elements were clipped to the balun for strain relief and connected electrically using mini-banana jacks. Additional clips and banana jacks allowed the 40 meter inverted-Vee elements to be shortened to 20 meter, utilizing the non-radiating wire as guy line. Two additional guy lines were used to support the mast and the base of the mast was affixed to the existing Bilby Tower hardware using only a small elastic cord. The mast consisted of

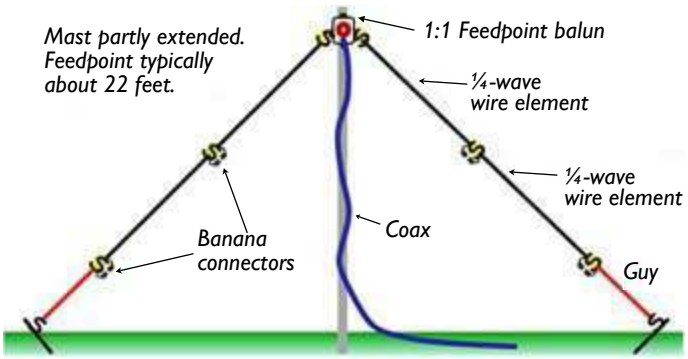


Diagram of Packtenna, arranged as a 2-band Inverted-Vee. Wire elements can be lengthened by plugging in the male and female banana connectors between quarter waves.

telescoping sections of fiberglass, 1.7" in diameter at the base and less than 0.25" at the tip. When collapsed, the total length was 26" and weight was 2.9 pounds.

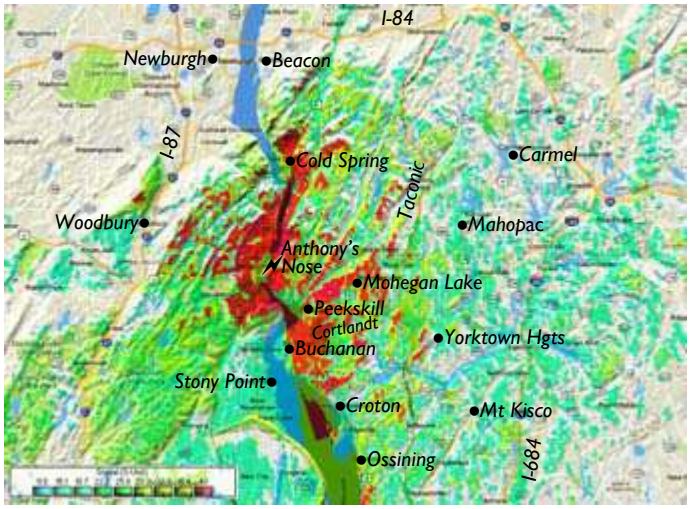
The sight of two men fumbling with the antenna mast and wires at the summit of Anthony's Nose elicited several confused looks from other hikers. One hiker recognized the equipment immediately, as he has been a radio amateur for 25 years. Todd, N2MUZ was out walking his dog on the trail and happened upon the portable station. After a nice chat, during which he expressed interest in getting involved with PCARA events, he and his dog went on their way. It was soon time to start operating the station.

Mast with HF antenna – Mike often assembles the mast without an assistant when he is camping in the Catskills. [KD2ITZ pic.]

The first band was 20 meters and a total of 10 QSOs were made to WA2MCR, N2KZ, N2EAB, F5UJQ, KD2GJJ, N4HES, AC2T, NE2Q, VE5RAC, and K5TAL. It was great to hear some familiar voices on 20 meters, but given the conditions, it was a pleasant surprise to hear Bob, F5UJQ over 3,500 miles away in Parentis-en-Born, France. RST was 55 on both sides. Bob has some impressive equipment shown on his QRZ.com page including a tall tower and multi-element beam.

Todd N2MUZ was the first radio amateur to contact the summit station, when he walked by with his dog. This photo was taken on a motorcycle trip through the Canadian Rockies. [N2MUZ pic]

HF activity was suspended at 11:00 a.m. for 2 meter simplex. A call was made on the W2NYW repeater for a list of participants and the FT-857D was set for 146.565 MHz. A roll-up Slim Jim by N9TAX was hoisted over a tree branch about 10 feet above ground. Multiple rounds of QSOs were then made with the following 12 stations: NM9J, WA2MCR, N2EAB, N2KZ, KD2HRW, KB2VJP, NE2Q, KD2EVI, N2CKD, K2NET, W2IX, N2GDY. By the last round of QSOs, the output power from the summit was a mere 50mW from a Kenwood TH-F6 HT, yet participants reported they could copy the signal with ease. High altitude is the key to success on VHF. The event also demonstrated that given the right conditions, the audio quality of FM simplex is far superior to repeater output.



Computer model of 2 meter coverage from Anthony's Nose using 'Radio Mobile' software shows how a 50 watt station would reach into neighboring states.

After 2 meters, it was time for lunch and a delicious cup of hot chocolate. The HF antenna was set for 40 meter use and QSOs were made with the following 10 stations: W8LXJ, NM9J, WA2MCR, N8WGE, N2KZ, KD8GYS, N4OCT, KE4SCW, NE2Q, and NY2PO. The 40 meter dipole was also resonant on 15 meters. Not much activity was heard, but one contact was made to a Cuban station operated by HK3TK.

Poor conditions on HF were not unexpected. Instead, difficulties with the http://wwff.co/ website were a source of frustration. Days before the event, details of the activation were submitted, but the site's calendar listed the wrong park reference number. Once an event is posted, it cannot be edited. A second event was created, but this time it listed the wrong call sign. It is unclear whether the logs will be entered into the system at all. Many may have been wondering why the club call sign, W2NYW, was not used for this event. According to WWFF rules, clubs need to log 200 QSOs for a valid park activation, while individuals only require 44. Despite the great efforts of the activators and the chasers, W2IGG was still about a dozen contacts short of the prescribed number. In contrast to WWFF, Summits on the Air (SOTA) only requires four

contacts for a valid activation. SOTA's website also does a great job of promoting activations and rewarding the chaser stations that contact summits. It is unclear why Anthony's Nose is not listed as a valid site for a SOTA activation. Thankfully, WWFF rules allow for multiple activations at the same site until the amount is reached. Mike was already planning his next visit and thinking of ways to better utilize the old tower hardware for a portable antenna system.

Despite the challenges, the event was a tremendous success. While it was certainly a thrill to make DX QSOs, it was likewise a pleasure to hear from old friends that aren't often active on these bands. The event also proved to be an opportunity to make new friends and the enthusiasm in everyone's voices was contagious.

One of the brass markers denoting location of the former Bilby Tower at Anthony's Nose. [KD2ITZ pic.]

-Lou, KD2ITZ and Mike, W2IGG

Bilby Towers - NOAA

Lou, KD2ITZ recommends the following article from NOAA (National Oceanic and Atmospheric Administration) to explain the Bilby Steel Tower, formerly located at Anthony's Nose.

What is a Bilby Tower?

NOAA's National Geodetic Survey and its predecessor organizations have been using **geodesy** to map the U.S. shoreline, determine land boundaries, and improve transportation and navigation safety for over two centuries.

Today, surveyors rely on the Global Positioning System (GPS), a constellation of 24 satellites that transmit radio signals from about 11,000 miles in space. When used according to special procedures, GPS receivers on Earth can determine position coordinates to centimeter-level accuracy (less than one-half inch).

However, surveying used to be a much more difficult earthbound endeavor.

Traditional survey methods require a clear line-of-sight between survey points. Intervening **hills** and **tall trees** can make obtaining a clear view challenging. Traditional surveying involves the use of accurate instruments. To get the best measurements, these instruments must be stable — just walking around a survey instrument can disturb it sufficiently to degrade observations.

Over the years, the U.S. Coast and Geodetic Survey (**C&GS**), the forerunner of today's National Geodetic Survey and Office of Coast Survey, used and developed several innovative survey towers to raise the level of surveys and obtain clear lines-of-sight while stabilizing equipment.


Jasper S. Bilby pictured in 1926.

One of the most famous — and most widely used — survey towers was developed by **Jasper S. Bilby** in 1926.

The Bilby Tower: Meeting a Need

Jasper S. Bilby, Chief Signalman, worked for the C&GS for over 50 years, from 1884 to 1937. In 1926, based on his familiarity with C&GS wood towers, steel pipe towers used by the U.S. Lake Survey, the popular steel windmill towers of the day, and probably his having seen toy Erector sets, Bilby designed a **portable, reusable, galvanized steel** survey tower.

Prior to the Bilby Tower, most survey towers were being constructed from wood and a new tower had to be built over each survey mark. At the time Bilby designed his steel tower, wood was becoming very expensive and the time to build a tower from scratch was costly. In fact, in the much flatter eastern portion of the U.S., C&GS changed the type of surveys used from triangulation to the less-accurate traverse type of survey to avoid having to build expensive wooden towers.

Designed to Strict Standards

The Bilby Tower was designed to strict specifications, drafted by Bilby with help from the Aeromotor company, builders of windmill towers. According to Bilby: "three essential requirements have to be satisfied to make the steel tower a success: First, the tower must have great rigidity and stability against vibration and against twist in azimuth; second, the tower must be so constructed that it can be readily erected and taken down; third, the total weight of a completed tower should preferably be light enough that a single moderate-sized truck can transport it from station to station." An additional requirement was that the tower needed to be designed so it could be constructed at different heights as individual circumstances required.

Putting the Tower to Use

Once the tower had been found to meet Bilby's specifications, the C&GS went on to use Bilby Towers for over 50 years – from 1927 to 1984. Other organizations that used the Bilby Tower included the U.S. Army

Corps of Engineers, the U.S. Air Force, the U.S. Geological Survey, the Inter-American Geodetic Survey (in Central and South America), the Geodetic Survey of Canada, and the Ordnance Survey in the United Kingdom. The towers were also used to make a survey connection between England and France across the English Channel. The C&GS also used the towers on survey projects in other parts of the world and taught several state agencies how to use Bilby Towers.

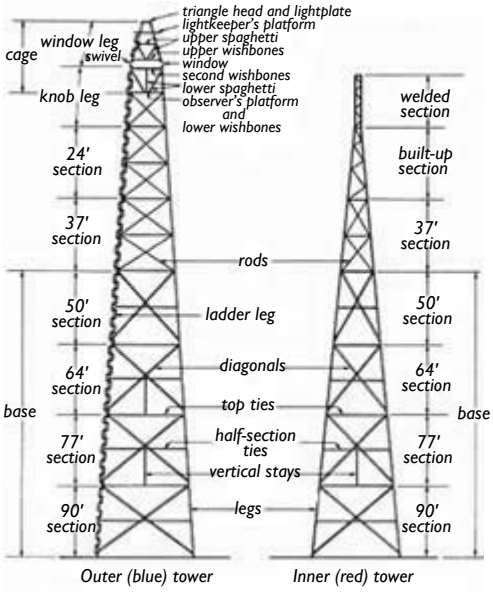


Diagram of a 90 foot Bilby Steel Tower showing nomenclature. The outer (blue) tower on the left surrounds the inner (red) tower on the right.

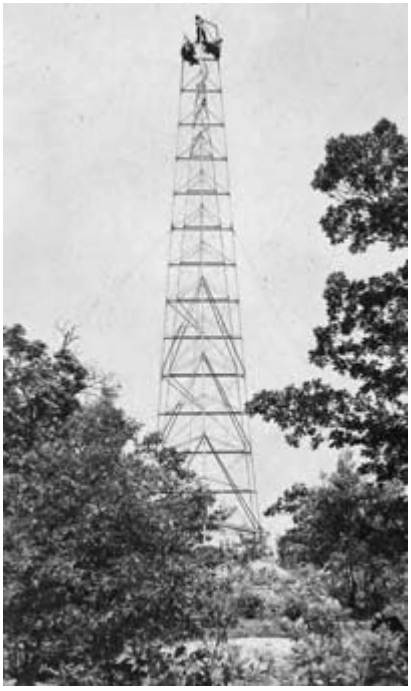
After the Bilby Tower came into usage in 1927, C&GS surveys in the eastern U.S. reverted back to triangulation, increasing the accuracy of the national survey network. Bilby Towers were found to save about 75 percent of the cost of former wooden towers.

Bilby Tower Construction

The Bilby Tower was very fast to construct. A trained crew of five, with the right equipment but no crane, could set four survey marks and construct both inner and outer towers in just one day. The size of the tower pieces were designed so that one person could handle most pieces. The spacing between the horizontal pieces of the tower was also designed so that the builders could reach from one level to the next.

Construction of Bilby Steel Tower. First sections of the inner and outer tower have been built, to a height of 13′ 8″.

One of the builders was responsible for building each of the three legs of the tower. Each of the three "leg-men" had a construction platform (a small "A" shaped wooden seat nicknamed the "A-Board"), which rested upon two of the tower's horizontal ties and just inside a leg. The leg-man sat on the platform while bolting on the next leg (vertical piece) and stood on the platform while bolting on the next tie (horizontal piece). The fourth builder passed steel and tightened bolts. The fifth builder, the "Building Foreman," stayed on the ground, supervised, organized tower parts, and used the truck winch to raise steel to the height of the builders.



Bilby Steel Tower erected in 1935 at Anthony's Nose.

Disassembly of Bilby Towers was even faster. A team of builders could take down two towers per day.

During building, a winch drum mounted on the rear wheel of the jacked-up building truck was used to help raise steel parts up to the height of construction. Preparing for observations, survey equipment was hauled up the tower by an electric winch in the observer's truck.

Bilby Towers could be used in moderate winds, but they were not indestructible. Towers settled or were blown over by tornados and hurricanes.

Conclusion

The ingenuity of Jasper Bilby in designing a tower that allowed surveyors to obtain needed clear lines-of-sight and accurate survey observations was enduring: the last Bilby Tower was built in 1984, over 50 years after it was first conceived by Bilby. The towers represent important tools in surveying our nation and reflect the determination of surveyors dedicated to getting the job done… no tree or mountain was enough to stop these men from completing the surveys that today are the backbone of our nation's spatial reference framework, called the National Spatial Reference System.

– Commander George E. Leigh, NOAA Corps, Ret'd.

Text source:
https://oceanservice.noaa.gov/news/features/aug10/bilby.html

Kitchen supplies for the shack

Were you thinking this article was about snacks and beverages for the radio room? Sorry to disappoint you… Instead here are some hints about items from the kitchen cabinet that could be put to good use in the radio shack.

Baking soda

Let's start with the humble box of baking soda, also known as sodium bicarbonate, $NaHCO_3$. This product was originally manufactured for baking purposes, where the white powder is mixed into dough or batter containing an acid component — such as buttermilk, lemon juice, vinegar, or sour cream. Baking soda reacts with the acids present, releasing carbon dioxide. The gas forms tiny bubbles that contribute to the texture of the cake or cookie.

The humble box of baking soda.

Baking soda is also sold for removing stale odors from the refrigerator. The cardboard box is opened, exposing the powdered product, then placed in the fridge or freezer, where it will absorb unwanted odors for a month or more.

Baking soda has many other uses besides leavening agent and odor absorber. One application you may find helpful in the shack or garage is for cleaning battery terminals that have become corroded. If you have an old-style flooded lead acid battery, it is all too easy for acid fumes to reach the copper terminals and cause corrosion. This usually appears as a white or blue-green powder encrusting the terminal. Sometimes the crust is so thick that the retaining clip, nut and bolt are no longer visible.


Corroded copper terminal on a lead-acid battery.

The solution — make a **paste** of 3 parts baking soda to one part of water, disconnect the corroded terminal then apply the paste to terminal and battery post using a damp cloth. Allow any effervescence due to the presence of acid to subside, then clean all parts with a damp cloth and dry off. Cover the metal parts with a thin coat of Vaseline® petroleum jelly before reassembly and re-tightening. **Safety note:** you must wear rubber gloves and eye protection whenever working with lead-acid batteries.


Normal appearance of a lead-acid battery terminal under its protective plastic cover.

If your spare parts box contains silver-plated connectors such as PL-259, BNC or N-type, another use for baking soda is to clean up tarnished silver. Silver plated connectors are usually made of brass with a thin coating of silver on top. Tarnish on the silver appears as a black or brown film over the normal shiny surface. It is caused by reaction of metallic silver with sulfur-containing compounds in the air such as hydrogen sulfide — to form black silver sulfide.

To treat a tarnished connector, prepare a 3:1 paste of baking soda with water and apply to the tarnished metal using a damp cloth or paper towel. Use an old toothbrush to reach inside surfaces with the mildly abrasive paste. When the shiny silver surface reveals itself, wash off the baking soda with plenty of water, then dry thoroughly before use. The improvement in appearance can be almost miraculous!


Cleaning a coaxial adapter with sodium bicarbonate paste.


Before and after pictures of a tarnished coaxial adapter (N-type to SO-239), following treatment with a 3:1 paste of baking soda and water.

One final use for baking soda — if you ever have an acid spill, for example acetic acid, sulfuric acid or hydrochloric acid (muriatic acid), you can neutralize the acid by sprinkling baking soda on to it. Wear eye

protection and use rubber gloves near any strong acid. Continue adding baking soda until the effervescence dies down, then wash the area with plenty of water.

For some more unusual applications of baking soda see:
http://www.care2.com/greenliving/51-fantastic-uses-for-baking-soda.html

Aluminum foil

Aluminum foil is widely used in cookery for covering joints, lining baking trays and wrapping irregular shaped food before placing in the freezer. It can also prove sufficiently versatile for use around the radio room.

Aluminum baking foil.

Perhaps you need to mix some two-part epoxy adhesive or some baking soda paste — cut out a small square of aluminum foil for the mixing job to protect your shack's work-surface.

Suppose you need to shield a cable or a connector to a greater degree than the original design allows – just cut off a length of aluminum foil, then wrap the cable or connector with the foil. If possible, ground the aluminum foil by attaching to a chassis ground terminal, or tightening underneath a chassis screw.


Use of aluminum foil for additional shielding of audio/video cables.

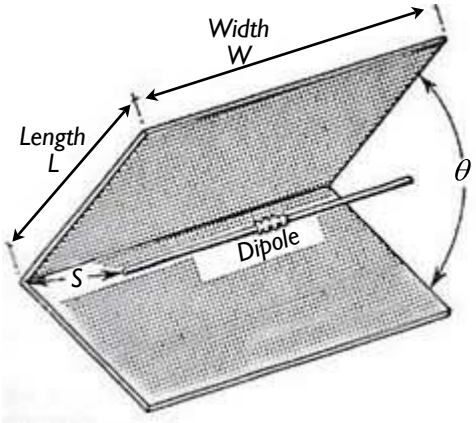
I have found this type of shielding useful with modern entertainment equipment which can be generating low-level signals in the amateur bands then radiating through the power cord, HDMI connectors, composite connectors etc. Another application is for radio receivers with a balanced 300 Ω antenna input, fed with 75 Ω coaxial cable. The solution is to use a 75 Ω-to-300 Ω balun transformer — but now there is a chance of unwanted ingress of strong signals into the unshielded section. To keep unwanted signals such as WHUD-FM out of the antenna input, wrap the coaxial connector and balun with aluminum foil, secure with a twist-tie then ground the foil to a nearby chassis screw.

You might think that using kitchen foil for electrical shielding is a poor quality "amateur" **kludge** — but we are in good company. Forty years ago, NASA engineers were completing the two Voyager spacecraft that would be launched toward Jupiter and Saturn in August/September 1977. In a recent PBS documentary "The Farthest", project engineer Frank Locatell explained that scientists were predicting magnetic fields around Jupiter that could accelerate particles and generate 40kV electric fields. Voyager had exterior cables feeding sensors at the end of the spacecraft's long booms and passage through such an intense radiation belt might induce high voltages that would damage critical electronic systems.

A solution had to be found quickly as the launch window was rapidly approaching — so a technician was dispatched to a local supermarket in Florida to purchase their entire supply of aluminum baking foil. This was unrolled, cut into strips, cleaned then wrapped around all the exterior cables and grounded to the spacecraft frame. The solution must have worked as both probes survived a close approach to Jupiter and Saturn, going on to explore Uranus and Neptune.


NASA's Voyager space probes had to be protected against radiation damage.

In addition to electrical shielding, aluminum foil has more uses around the radio room. Would you like to increase the range of Wi-Fi signals radiated from a wireless router situated at one end of the house? A simple way to do this is to fabricate a **corner reflector**.



Horizontally polarized corner reflector antenna (after RSGB).

Take a rectangular sheet of cardboard, sized around 10" × 20" — you could use a file folder or a ring binder. Cover the inner side with aluminum baking foil. Fold at an angle of 90 degrees then arrange the reflector behind the router's vertical antenna — which could be either internal or external. The antenna should be located ¼ λ to ½ λ in front of the fold,

roughly 2½" – 5" at 2.4 GHz. Gain should be around 10dB.

Would you like to increase the brightness of a radio dial that is lit from behind with a bulb or LED? Fabricate a small reflector from aluminum foil and fasten behind the light. Just make sure there is no chance of metallic aluminum shorting out any electrical connections.

Corner reflector made from aluminum foil is positioned behind a wireless router or wireless access point to increase range in the direction shown (white arrow).

You can even use aluminum foil to make a transmitting or receiving antenna for indoor use. Bear in mind that aluminum is difficult to solder, so connection to the feeder will need a mechanical joint such as a screw-down barrier strip or hose clamp. You could wrap aluminum foil around PVC tubing for a broad band VHF antenna, or you could fabricate a slot antenna in a flat aluminum sheet — as described in the article "Lots of Slots", *PCARA Update* for July 2016. (These antennas are suitable for indoor use, but not for permanent mounting outdoors where corrosion could cause intermittent connection problems.)

Polyethylene bags

When I was first licensed in northwest England in the 1960s, I would go on shopping trips from Southport to the City of Liverpool by electric train. Within walking distance of Liverpool Exchange Station there were several electronic stores selling government surplus equipment going back to World War II. Smaller items were frequently heat-sealed into tough polyethylene bags for long-term storage in a dark, damp military store. Radio items would emerge good as new, sometimes smelling of tropicalization treatment.

Surplus components heat-sealed into polyethylene bags.

Fifty years later, we can make good use of modern polyethylene bags with an air-tight seal for organizing and protecting our radio parts. Good news — there may be a ready supply of bags already awaiting in your kitchen.

My favorite brand is the Ziploc® freezer bag, manufactured from heavy gauge polyethylene film, with a double zipper press-action to close and a tab on one side for easy opening. A white label is printed on the same side for labeling with a felt pen. Freezer bags are available in pint, quart, one gallon and two gallon sizes.

Gallon and quart Ziploc freezer bags.

Pint size bags can be used for electronic components (be careful with semiconductor items that are sensitive to static electricity — press the leads into conductive foam before placing in the bag). Quart size bags are suitable for storing cable ties and coaxial connectors (e.g. PL-259). The larger size bags can be used for wire antennas and hanks of coaxial cable. I have used gallon-size bags to store accessories associated with a handi-talkie as well as collections of manuals and literature for a particular radio. Another use is to protect small-to-medium size transceivers intended for field use, preventing dents and scratches during transport and sealing out bugs and moisture during storage. Ziploc Space Bags® are available in larger sizes than freezer bags, suitable for packaging full-size radios.

Static-sensitive components should be placed in conductive foam prior to bagging.

Generic storage bags made from lighter-gauge polyethylene film can be useful for components stored in a limited space. Look for sandwich-size (6½" × 5⅞") and snack size (6½" × 3¼") bags — they are not as tough as the Ziploc freezer bags, but are more flexible for folding into a drawer or storage box.

Cookie tins

Does your kitchen have any metal containers such as cookie tins or cake tins? They are usually round or rectangular in shape and manufactured from tin-plated steel, with a close-fitting lid. These boxes may become surplus after the holiday season when all the cake has been eaten.

Tin boxes can be valuable for storing vacuum tubes and other small components that might be damaged if crushed. There is no problem with static electricity inside a conducting container.

One other suggestion for a cookie tin — store your spare handi-talkie inside the metal container, with the lid firmly in place. The conducting metal will act as a Faraday Cage, preventing any electromagnetic fields from reaching the equipment inside. This is one suggestion for guarding sensitive electronic equipment against an electromagnetic pulse, caused by a close lightning strike or worse.

Tinplate boxes for cakes and cookies can be reassigned for storage of vacuum tubes and small parts.

Raiding the store

One suggestion before you carry out a raid on the kitchen store for items useful in the radio room. Be sure to check with the **head-chef** beforehand. Failure to do so may result in a lack of radio room snacks and a withdrawal of cooperation over additional supplies in the future. - NM9J

Wise words for kitchen and shack. The small print reads: "WHEN NOT IN USE DON'T LEAVE IT SWITCHED ON".

Holiday Dinner

PCARA's Holiday Dinner has been arranged once again at the **Cortlandt Colonial Manor Restaurant**. The event begins at 5:00 p.m. on Sunday December 3.

The restaurant is located at 714 Old Albany Post Road. Directions — take the Bear Mountain Parkway to the Highland Avenue exit, then head north, away from Peekskill. Proceed down Highland Avenue and across the bridge. The restaurant and car park are immediately on the left, just before the former 'rock cut'.

The dinner menu is the restaurant's 'Package Number Three'.

Open Soup and Salad Bar
Soda, iced tea and soft drinks (unlimited)
choice of:
Prime Ribs of Beef
Grilled New York Strip Steak
Grilled Pork Tenderloin Medallions
Jumbo Shrimp with crabmeat stuffing
Chicken – Marsala, Chardonnay, Sherry or Madeira
Penne ala Vodka, traditional or w/grilled chicken
Cake – chocolate mousse

Cost will be $40.00 per head including service, but not including any alcoholic drinks.

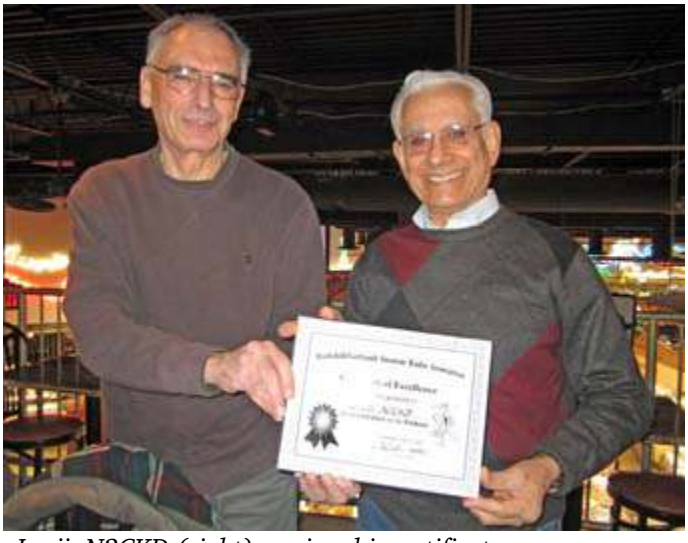
Cortlandt Colonial Manor Restaurant

Presentations

The PCARA Breakfast on Saturday November 18 at Turco's in Yorktown was well attended. Two presentations were made to members who had been unavailable at previous events.

A plaque was presented to Barry K2BLB for all his efforts on behalf of PCARA during 2017 (see Greg's column and photo, page 1).

Lovji N2CKD was unable to attend the post-fox-hunt gathering on September 23rd, so his second place certificate was also presented at Turco's.



Lovji, N2CKD (right) receives his certificate as runner-up in PCARA's second 2017 Foxhunt from September fox NM9J. [Pic by Lou, KD2ITZ.]

ARRL Field Day results

Results from Field Day 2017 were published in the December 2017 issue of *QST* and in mid-November on the ARRL web site. See http://www.arrl.org/results database?event_id=91339 .

PCARA entered Field Day 2017 in Category 2A — meaning **two** stations transmitting simultaneously on the HF bands (with an optional "free" station on VHF), operating as a Club or Non-club **portable** entry. We continued the rental trend from 2016 by housing both HF stations in two separate rental trucks, providing protection from the weather as well as audio isolation from each other.

PCARA's Field Day 2017 was housed in two rental vans and a push-up shelter.

Support for PCARA's 2017 effort was encouraging with 22 licensed members and friends taking part. The number of contacts was very similar to 2016, though the number of points was somewhat down. See *PCARA Update,* July 2017 for the post-event report. Here is a summary of PCARA Field Day results over the years:

Peekskill/Cortlandt ARA, W2NYW, Class 2A

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

	2013 (Class 1A)	2014	2016	**2017**
QSOs:	775	722	816	**813**
Power:	2 (<150W)			
Participants:	14	16	19	**22**
Total score:	2040	2460	3018	**2734**

With publication of the full results by ARRL, we can make a comparison of PCARA's efforts with those of neighboring clubs in Eastern New York and the Hudson Division. In 2017, PCARA was:

- **First** out of two entries in Category 2A, ENY section.
- **Tenth** out of 36 in all of ENY section.
- **Fourth** out of 14 in Category 2A, Hudson Division.
- **29th** out of 98 in the entire Hudson Division.
- **120th** out of 389 in Category 2A nationwide.
- **623rd** out of 2,964 total entries listed.

Congratulations to WECA who once again came first in the entire **Eastern New York** section, with 12,034 total points (category 4A). Here is a list of the leading entries from our friends in neighboring ENY clubs so you can compare their performance with PCARA's.

#	Call	Points	Cat	QSOs	Club
1	N2SF	12,034	4A	3,453	Westch Em Comm Assn
2	K2CT	9,026	3A	2,548	Albany ARA
3	K2QS	7,940	3Ac	2,233	QSY Society
4	K2AE	7,688	6A	2,195	Broughton Meml FD Gp
5	N2LL	7,042	6A	1,691	Overlook Mountain ARC
6	W2C	6,842	7F	1,815	Warren Co RC
7	W2HO	3,832	5A	807	Orange Co (NY) ARC
8	K2DLL	3,590	3A	880	Saratoga Co ARA
9	K2PUT	3,150	3A	620	Putnam Emer Am Rep Lg
10	**W2NYW**	2,734	2A	813	Peekskill / Cortlandt ARA
11	W2YRC	2,538	3A	610	Yonkers ARC
12	WD2K	2,520	3A	509	Rip Van Winkle ARS
13	W2EGB	2,488	2A	719	East Greenbush ARA
14	KC2OUR	2,480	4F	781	Orange Co ARES RACES
15	NY2U	1,948	4A	310	Troy ARA

Compared with 2016, PCARA made only three less contacts, but scored a total of 284 fewer points. As a result, our standing in Eastern New York slipped from eighth to tenth position. This is still a creditable score, considering that other stations in the top 12 were in category 3A or higher (>3 simultaneous stations) and many had a GOTA station.

For next time, it could be worthwhile ensuring that antennas are raised and all stations are ready to go by start time. Both HF stations should be computer equipped for CW/digital modes. Digital mode contacts such as RTTY and PSK-31 count for double points, just like CW QSOs. Attention to bonus points that we missed such as "Alternate Power", "Site Visitation" and "Safety Officer" could also raise our score. There were additional suggestions in the July 2017 newsletter including more headroom in the vehicles, a stronger mast for VHF and a bandpass filter for 6 meters.

Field Day 2018 is scheduled for the weekend of June 23-24. Here's looking forward to the next time PCARA goes out into the field.

- NM9J

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 Update* Editor:** Malcolm Pritchard, NM9J
E-mail: NM9J 'at' arrl.net
Newsletter contributions are always very welcome!
Archive: http://home.lanline.com/~pcara/newslett.htm

PCARA Information

PCARA is a **Non-Profit Community Service Organization**. PCARA meetings take place the first Sunday of each month* at 3:00 p.m. in Dining Room B of NewYork-Presbyterian/Hudson Valley Hospital, Rt. 202, Cortlandt Manor, NY 10567. Drive round behind the main hospital building and enter from the rear (look for the oxygen tanks). Talk-in is available on the 146.67 repeater. *Apart from holidays and July/August break.

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

Sun Dec 3: PCARA Holiday Dinner, Cortlandt Colonial Manor Restaurant, 5:00 p.m. Includes Election of Officers.
Sat Dec 16: PCARA Breakfast, Turco's Yorktown Heights, 9:00 a.m.
Sun Jan 7, 2018: PCARA Annual Bring & Buy Auction. New York Presbyterian - Hudson Valley Hospital, 3:00 p.m.

Hamfests

Sat Jan 6, 2018: Ham Radio University and ARRL NYC/LI Section Convention, LIU/Post, Hillwood Commons Student Center, 720 Northern Blvd, Brookville, NY. Doors open 7:30 a.m.

VE Test Sessions

Dec 2, 9, 16, 23: Westchester ARC Radio Barn, 4 Ledgewood Pl, Armonk, NY. 12:00. Pre-reg M. Rapp, (914) 907-6482.
Dec 10: Yonkers ARC, Will Library, 1500 Central Park Ave, Yonkers NY. 1:00 pm. Pre-reg. John WB2AUL, (914) 969-6548.
Dec 14: WECA, Westchester Co Fire Trg Center, 4 Dana Rd., Valhalla, NY. 7:00 p.m. S. Rothman, (914) 949-1463.
Dec 18: Columbia Univ ARC, 531 Studebaker Bldg, 622 W 132nd St, New York. 6:30 pm, Alan Crosswell (212) 854-3754.

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