



PCARA Update



Volume 19, Issue 5 Peekskill/Cortlandt Amateur Radio Association Inc. May 2018

Winds of change

The April 8th PCARA membership meeting at Hudson Valley Hospital was a nearly sold-out event. If we keep growing and going like this we're going to need a larger place to meet. I'm not complaining! At the meeting, David K2WPM reviewed changes to the



At the April meeting, Joe WA2MCR and Greg KB2CQE signed paperwork to amend PCARA's constitution.

PCARA Constitution and the filing of PCARA's application for Section 501(c)(3) of Title 26 of the United States Code to become a tax-exempt non-profit organization. A majority vote of the membership

present approved the application and associated fees and costs. This evolution will permit PCARA to apply for grants and accept tax-deductible contributions to help fulfill our goal of providing communications support to surrounding communities. Please join with me in thanking David K2WPM for his selfless efforts on our behalf. **Thanks David!**

Five brave and intrepid souls from PCARA ascended **Bull Hill** (Mt. Taurus) near the Hudson Highlands town of Cold Spring on Sunday April 15, 2018. Among their number were Richard N1GIL, Lou KD2ITZ, Mike W2IGG, Jared KD2HXZ and Todd N2MUZ. As if climbing a 1,420 foot mountain — a hike of 3.6 miles — wasn't enough, they managed to operate on both 2 and 20 meters! A detailed report and photos can be found in this month's edition of the *PCARA Update*. Way to go PCARA Mountain Rangers!

The next **PCARA Foxhunt** is on Saturday May 12, 2018 (*73 Magazine* Foxhunt Weekend). The role of Fox will be played by Jay N1NRP and Marlon KC1EHW from our neighboring club — the Candlewood Amateur Radio Association. Jay and Marlon came first in

PCARA's last Foxhunt on September 23, 2017. Registration will begin at 2:30 p.m. on May 12th in the Beach Shopping Center on Dayton Lane in Peekskill, NY. The hunt will take place between 3:00 p.m. and 4:30 p.m. At the conclusion of the Foxhunt we will meet at a local restaurant or diner to award certificates and relax. Rules are included in the pages of this month's newsletter.



The next **PCARA Breakfast** is scheduled for Saturday May 19, 2018 at 9:00 a.m. at Turco's in Yorktown Heights, NY. Plan to get there early to make sure you find a place to sit. Be sure to join us and bring your appetite!

Our next meeting is on Sunday May 6, 2018 at 3:00 p.m. at New York-Presbyterian / Hudson Valley Hospital in Cortlandt Manor, NY. 2018 ARRL Field Day planning will be on the agenda. I look forward to seeing each of you there.

- 73 de Greg, KB2CQE

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PCARA Officers

President:

Greg Appleyard, KB2CQE; kb2cqe at arrl.net

Vice President:

Joe Calabrese, WA2MCR; wa2mcr at arrl.net

Net night

Peekskill/Cortlandt Amateur Radio Association holds a weekly net on the 146.67 MHz W2NYW repeater on Thursdays at 8:00 p.m.

Mount Taurus hike - KD2ITZ

On April 15, 2018, members of PCARA and the Appalachian Mountain Club (AMC) hiked to the summit of Mt. Taurus (Bull Hill) near Cold Spring, NY. While Winter Storm Xanto was burying the Midwest in over a foot of snow, no precipitation had yet reached the Hudson Highlands. Conditions on the trail were cloudy with low winds and temperatures in the mid-thirties. Seven hikers were in the group: Jared KD2HXZ, Lou KD2ITZ, Mike W2IGG, Richard N1GIL, Todd N2MUZ, and two other members of AMC.



Left to right: Richard N1GIL, Mike W2IGG, Jared KD2HXZ, Lou KD2ITZ, Todd N2MUZ.

The ascent to the summit began on the Washburn Trail. The 2.4-mile path wound past the scarred landscape of an old quarry; then the climb quickly steepened approaching the peak — 1,420 ft above sea level. There were many opportunities along the route to view the river valley. On this cloudy day, one could see as far as Bear Mountain, about 9 miles away. With clear skies, the Manhattan skyline is visible in the distance.



View from Mt. Taurus overlooking the Hudson River and Storm King State Park. Absence of sunshine and sunspots did not detract from enjoyment of the hike. [KD2ITZ photo]

Lou, Mike, and Todd had departed earlier than the others to set up the HF station. Mike brought his Yaesu FT-857D and PackTenna mast. This same equipment has been described in the December 2017 PCARA Update article summarizing the trip to Anthony's Nose. A suitable spot was found near the peak of Mt. Taurus to assemble a 20 meter inverted-vee. A clearing in the trees accommodated alignment of the antenna elements along a southwest to northeast axis. The antenna's center was approximately 22 feet above ground and the ends were roughly 15 feet high.

A total of 16 contacts were made on 20 meter SSB to the following stations: DJ5AV, EA2LU, KC0KDG, KDOZLI, KE0LCW, KM4IK, KN2X, N2YTF, NDOC, NG6R, NM9J, NS7P, NW7E, W0MVA, W5ODS, WD0DAH. It was a thrill to make contacts as far away as Europe to the East and Oregon to the West. Part of the success was due to the structure of the Summits on the Air (SOTA) program. SOTA awards points to *activators*, operating from summits, and *chasers* who contact the activators. Using the SOTA Spotter App on his Android smartphone, Mike was able to share his location and operating frequency with the sotawatch.org site. This encouraged chasers across the globe to work the summit station.



Twenty meter contacts. Sixteen QSOs were made, spanning locations from the Pacific Coast to Europe. Map generated by <http://www.qsomap.org/>.

This was the first time since 2014 that Mt. Taurus has been used for SOTA activity. A complete list of activations can be found on the SOTA website:

<http://www.sota.org.uk/Summit-Activations/W2/EH-019>. Interestingly, one of the 16 chasers listed above is Tom N2YTF. He has also activated the site himself in years past. When contacted by email he noted that he has been experimenting with FT8 HF contacts from summits and is also interested in making SOTA contacts on the 33 cm (902-928 MHz) band.

The W2NYW repeater was a valuable asset for coordinating logistics among the hiking party. It was likewise a source of friendly conversation with some of

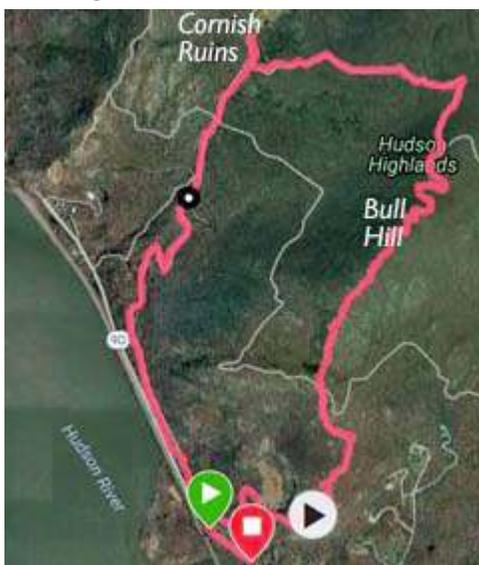
the hams in Cortlandt Manor: David KD2EVI, Kenny KB2QZK, and Malcolm NM9J. Malcolm also made a ten-mile 2 meter simplex contact to the summit and gave a good report to Mike, who was using a Kenwood TH-F6 HT running 5 watts.

After lunch, the group began their descent. They followed the Cornish Trail, which led past the ruins of a former estate. Edward Cornish, a wealthy businessman, acquired the property just over 100 years ago and maintained a mansion, greenhouse, barns, and other



Richard NIGIL touring the remains of the Cornish Estate. This stately stone structure was not part of the mansion, but instead housed a prized herd of cattle. [W2IGG photo]

structures there. Fire destroyed the buildings in 1959 and the land was eventually purchased by the state. The grounds, which once held manicured gardens, have been reclaimed by the forest. Skeletons of old buildings are all that remain.



Map showing GPS data uploaded from Mike, W2IGG's Garmin Forerunner 225 watch using Garmin Connect software.

in Cold Spring obliged the hikers with delicious beverages.

The journey ended shortly after 2:00 p.m. The total distance traveled was nearly 6.5 miles. Despite all the water they drank on the trail, several participants were thirsting for refreshment upon arrival at the trailhead. Thankfully, one of the fine establishments

- Lou, KD2ITZ

Hack a computer speaker into an amplifier - N2CKD

I was inspired to build a high volume audio amplifier circuit after I heard a small child play a beautiful rendition of Gershwin's *Rhapsody in Blue* on the harmonica (a challenging tune for a harmonica). See: <https://www.youtube.com/watch?v=8u-6LzNtkpQ>. Having played the harmonica myself as a youngster, I thought I would try playing it through an audio amplifier to increase the volume — as musicians do. But first I had to arrange an audio amplifier. YouTube has many articles for making guitar amplifiers. I found a site that showed how to modify an external computer speaker, modifying it into a high volume audio amplifier. See: <http://www.instructables.com/id/Hack-a-PC-Speaker-Into-a-Guitar-Amp/>.

I adapted the method suggested on the Instructables site to build my own guitar/harmonica audio amplifier using an amplified computer speaker that I had previously used with my old desktop PC. And to prove that almost any amplifier can be modified to produce a high audio volume, I also modified a portable AM/FM radio.



Stereo speaker system for a desktop PC as modified by Lovji. [N2CKD pics.]

I went through four stages. First, I started by modifying the computer speaker to make an audio amplifier. Second, I added a pre-amplifier using a three-transistor circuit constructed on breadboard. Third, I used a separate loudspeaker as a substitute microphone and finally I used a surplus CB dynamic microphone to complete the project. The resulting guitar/harmonica amplifier can also be used as a simple Karaoke player.

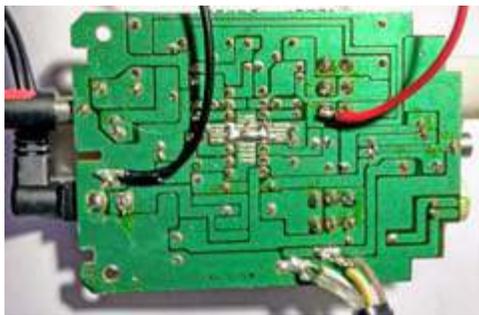
Stage 1. Modify a computer speaker

I started by opening up my old amplified PC loudspeaker and removing the amplifier circuit board as shown in the photo. I located the volume control potentiometer on



Circuit board from Lovji's computer speakers. Volume control is at lower right.

the circuit board then applied my signal tracer / oscillator probe to the three terminals of the potentiometer until I heard the loudest signal coming out of the amplifier. To this potentiometer terminal, I soldered a red wire on the underside of the circuit board as shown in the photo. I then found a suitable ground point on the circuit board and soldered a black wire to it. I brought the red and black wires out to a female 1/4" audio jack, ready for a guitar to be plugged in. I then re-assembled the amplified PC speaker. The modification was complete.

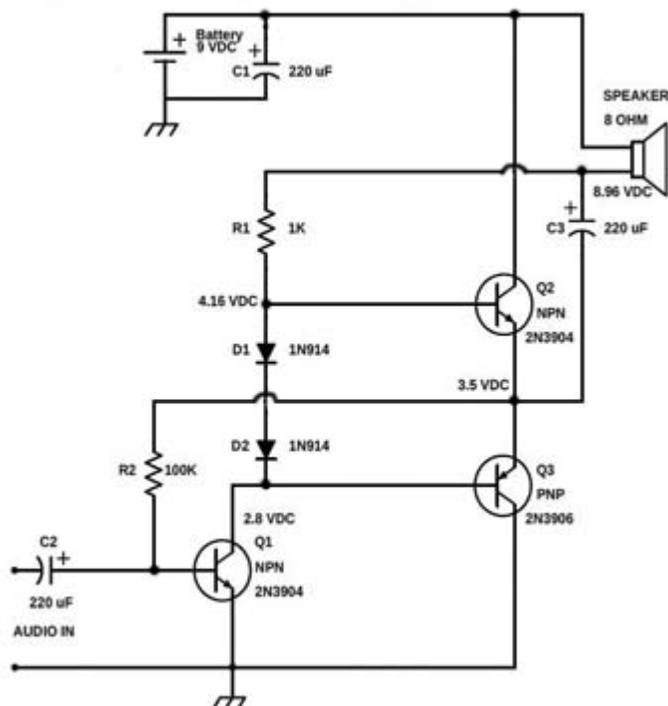


Underside of circuit board with red wire soldered to 'hot' terminal of the volume control and black wire to ground.

To test the modification, I powered up the amplified PC speaker, attached a signal tracer/probe to the audio jack and confirmed audio sound.

Stage 2. Three-transistor audio preamplifier

I missed attending the PCARA TRACCS Workshop in February 2017 to build the three-transistor audio amplifier circuit which was part of K4ICY's Weekend Radio project for a code practice oscillator. I finally got around to building the audio amplifier circuit on a solderless breadboard. My thanks to Lou KD2ITZ and Bob



Three-transistor audio amplifier design by K4ICY as constructed at PCARA's February 2017 'TRACCS' workshop.

N2CBH for their generous gift of parts and circuit diagram. [Details: http://k4icy.com/weekend_radio_3tr-audio-amp.html - Ed.]

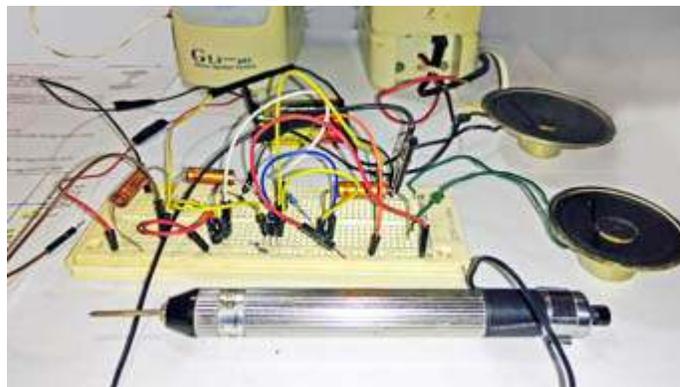
The breadboard version of the circuit works well but output is only between 50 to 100 mW of audio power into an 8 ohm speaker. This might be sufficient for a quiet code practice oscillator but it was not enough for my other intended uses — so I decided to employ the three-transistor circuit as a **preamplifier** to feed the amplified speaker. I am glad to say this arrangement works equally well with a dynamic microphone and for amplifying a low power code oscillator.

By the way, the signal tracer/oscillator probe tip can also be used as a Morse code practice oscillator by touching the probe to the preamplifier input terminal.

Stage 3. Loudspeaker or CB mic input

After making the audio amplifier modification I did not have any means of testing it other than with a signal tracer/oscillator but I needed to check the audio quality. Lacking a dynamic microphone, I decided to substitute a small 8 ohm loudspeaker. A loudspeaker can work in a similar way to a dynamic microphone since they can both capture sound energy on a diaphragm, which is attached to a coil moving in a magnetic field. The tiny current generated by movement of the coil is then amplified by connection to a suitable amplifier.

I attached the 8 ohm loudspeaker (used as a microphone) to the three-transistor audio amplifier input terminals then connected the pre-amplified output to the input terminal of the modified computer speaker. This substitute microphone works and sounds almost as well as a regular dynamic microphone.



Lojji's 8 ohm loudspeaker (far right) acts as microphone, feeding into the three-transistor preamplifier constructed on solderless breadboard. Preamp output feeds the amplified speaker. (Signal tracer/oscillator in foreground.)

I also tried using a high impedance electret microphone — but it did not function. This was probably due to a lack of external power to supply the electret microphone's built-in circuitry.

A few days later, I found an old CB-style dynamic microphone in my junk box. This microphone had a

female 4-pin microphone connector on the end of the curly cord. I wired a compatible 4-pin male microphone socket, with a black wire to pin 1 (shield) and a red wire to pin 3 (PTT)



Ex-CB dynamic microphone was wired through a 4-pin microphone socket to the three-transistor preamplifier.

then shorted pins 2 (audio) and 3 together. I connected the 4-pin male socket to the breadboard with black wire to ground and red wire to the input capacitor. I connected the CB dynamic microphone to the male jack and powered up the preamplifier and amplified speaker. The CB dynamic microphone worked well and sound quality was very clear. Any low impedance dynamic microphone should work with this preamplifier circuit.

Stage 4. Modification for an AM/FM Radio

To prove that any amplifier circuit can be modified to produce high volume, amplified sound I decided to modify my portable AM/FM battery / mains receiver. See:

<http://www.instructables.com/id/Convert-Any-Radio-Into-a-Guitar-Amp/>.



Lovji's AC/battery powered AM/FM Panasonic radio. [N2CKD pics.]

I opened the radio, taking care not to touch mains power or charged capacitors.* I located the volume control potentiometer.

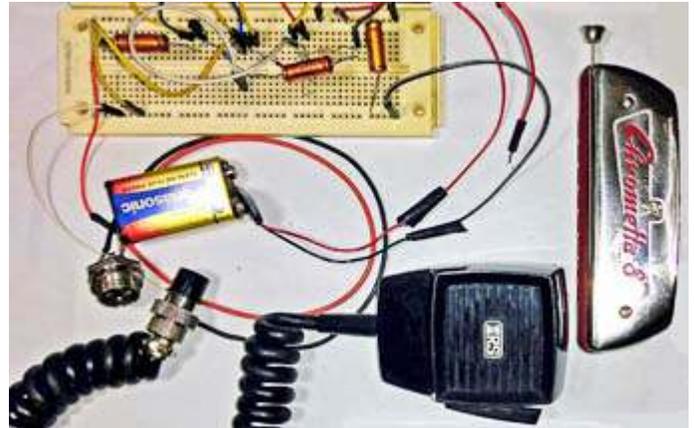


Signal injector applied to radio's volume control.

Portable receivers are tightly packed and sometimes the potentiometers are located in inaccessible locations — as was the case with this radio. With power on, I touched my signal tracer to the potentiometer terminals for the loudest signal, confirming plenty of audio output. Should I wish to use this radio as an amplifier I would just solder the wires

to the volume potentiometer as described in Stage 1 above. [*Safety note. When starting work on any AC-powered equipment, first disconnect the AC power cord! —Ed.]

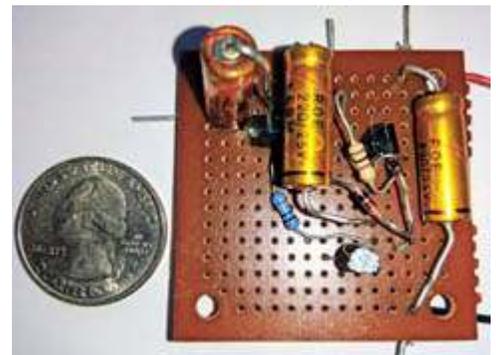
Next, I connected the output of the three-transistor audio amplifier to the volume control and connected the signal tracer probe to the audio input terminal. The signal tracer's oscillator sound was amplified to a high volume, confirming that the circuit was performing well. Finally I attached a CB dynamic microphone to the male audio jack on the breadboard amplifier and played a tune on the harmonica — which came out loud and clear.



CB microphone, three-transistor preamplifier and an amplified speaker were successfully tested by Lovji — by playing a harmonica through the circuitry.

Hard-wired preamplifier

Since the breadboard audio amplifier circuit worked so well, I tried hard-wiring it onto a 2" × 2" circuit board. It is much more stable than the breadboard version and works very well.



Lovji re-wired the three-transistor audio preamplifier onto a small, perforated circuit board.

Conclusions

Almost any device with a speaker could be tapped for high volume amplification. Before you throw out old electronic junk — consider recycling the amplifier and other parts.

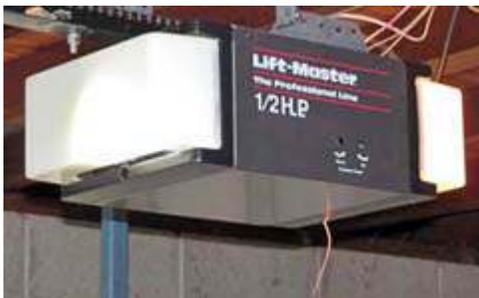
This was a fun and useful project constructed with left-over material and re-useable items from the junk box. Hack an amplifier and play some music!

- 73 de Lovji, N2CKD

LED opener

March came in like a lion during 2018 — and continued roaring loudly for most of the month. A succession of snow and wind storms brought down trees, tree limbs, power lines and telecom cables in our part of the world. One morning after clearing the driveway of snow yet again, I pressed the button on my garage door opener and —

nothing happened. The motor was running but the door was not moving. After 24 years of steady service, my Lift-Master ½ HP opener had a broken gear assembly that was no longer turning the chain drive.



After 24 years, the original garage door opener had failed.

I called a local garage door company and scheduled an appointment to have the opener replaced. The company was very busy and the earliest available appointment was eleven days away. In the meantime, my door-raising arm was getting stronger and stronger as I now had to open and close the door manually.

On the appointed day, I had another call from the garage door company — they had run out of openers! I was rescheduled for one week later.

Fortunately, the second appointment in late March was kept and a shiny, new LiftMaster® door opener with belt drive was soon installed in the garage.



New LiftMaster garage door opener replaced the old model.

I asked about the unusually high demand for garage door service during this winter's bad weather — the installer told me that many of his customers had suffered **surges of electricity** which burned out the door-opener electronics. This was a result of overhead wires, poles and electrical transformers being brought down during recent storms.

Let there be light

One request the garage door technician made was for a pair of 60 watt standard **incandescent** light bulbs. He knew that LED lamps are not recommended for door openers because of interference problems. I brought him a pair of 'new old-stock' long-life GE tungsten lamps.

My own experience with an LED lamp was reported in these pages several years

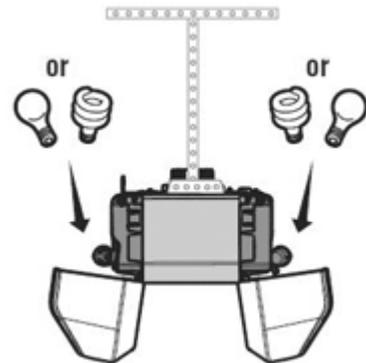


GE 60W incandescent lamp in new opener.

ago. After installing an “EcoSmart” LED lamp near the antenna of my previous garage door opener, the 390 MHz radio receiver was so swamped with noise that it would no longer obey commands from the remote control while the lamp was lit. See “Wireless light”, *PCARA Update*, October 2011.

The GE tungsten lamps were working fine in the new opener, but I was not happy with the situation. Incandescent lamps generate a lot of heat and I have seen plastic lamp covers distort and discolor when a lamp is too close. Life can be limited in the vibration-prone environment of a door-opener unless ruggedized lamps are fitted. The LiftMaster installation manual gives the following advice for installing lamps:

1. Pull on the top center of the light lens and rotate the light lens down.
2. Insert an A19 incandescent (100W maximum) or compact fluorescent (26W, 100W equivalent) light bulb into the light socket.



NOTE: DO NOT use halogen, short neck or specialty light bulbs as these may overheat the end panel or light socket. DO NOT use LED bulbs as they may reduce the range or performance of your remote control(s).

3. Rotate the lens up to close.

I did not want to install compact fluorescent lamps in the new opener. They are not well suited to this type of application where the light is only on for short periods of time. CFLs take a while to warm-up before full light output is obtained. Their life is shortened by frequent switching, they contain toxic mercury and they have RF interference problems of their own.

Light dawns

On a recent visit to Home Depot, I noticed a new product in the garage door supplies section. The Genie brand “Garage Door Opener LED Bulb” claims “No interference with most major garage door openers”. The product “works with all brands” and is “vibration resistant”. Light output is equivalent to a 60 watt incandescent lamp, for an electrical consumption of only 10 watts.



I purchased two of the Genie bulbs — they are \$9.98 each — for a test against the GE incandescent lamps and against a pair of conventional LED light bulbs. In my experience, Philips LED lamps have less RF interference than other brands, so I chose a pair of Philips 100W replacement bulbs costing \$12.97 for two.

Examination of the Genie LED lamps showed a similar construction to the Philips lamps. They are both



Genie garage door opener LED bulb.

A19 size, with a translucent plastic dome over a white opaque cover surrounding the electronic components. Color temperature is 3000 K (deg Kelvin) for the Genie lamps and

2700 K for the Philips lamps. Both types are rated non-dimmable with country of manufacture being China.

Illuminating test

I carried out a simple range test while the garage door opener lamps were lit. Using the Lift-Master remote control, I walked away from the garage, operating the remote to open and close the door. As I walked down the street, I made a note of the distance from the garage where the remote could

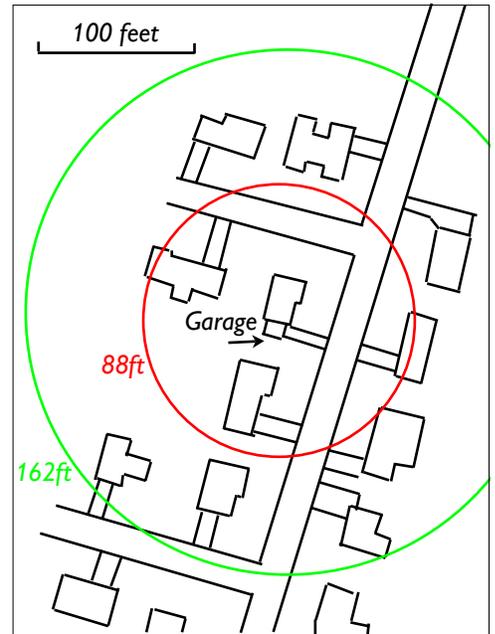


Remote control range test.

no longer control the door reliably. Here are the results in a table:

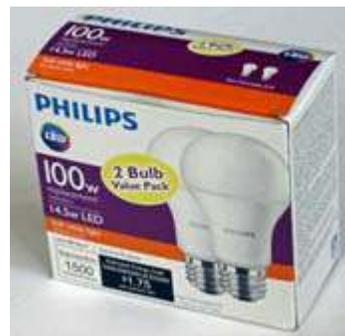
Lamp type	Distance
Philips LED lamp	88 feet
GE incandescent	162 feet
Genie LED bulb	162 feet

The good news is that the Genie LED and GE incandescent lamps are **equally quiet** at 300 MHz, allowing operation by remote control nearly twice as far away as the Philips LED lamps. (It is also worth noting that the Philips LED lamps allowed the remote control to operate much further away than the noisy EcoSmart bulb that I tested in 2011 — which prevented me



from closing the door from just outside the garage. But the reduced range with the Philips LEDs might still be enough to prevent the door being closed while driving away down the street.

Sketch map shows increased range of garage door opener using GE incandescent or Genie LED bulbs (green) compared to Philips LED lamps (red).



Philips LED lamps.

I left the Genie LED bulbs installed in the Lift-Master garage door opener and so far they have been working fine. For more information on Genie LED lamps see:

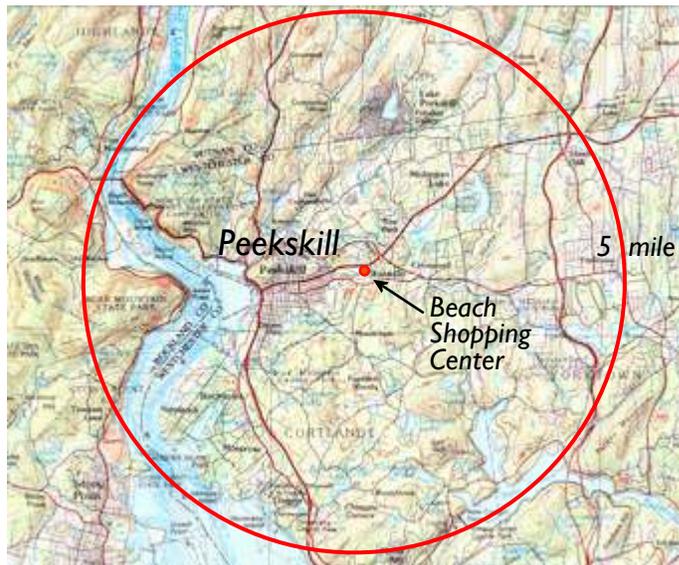
<http://www.geniecompany.com/garage-door-openers/accessories/led-light-bulb.aspx>

One other possible application of the Genie LED bulbs might be for a bedside lamp or desk lamp used adjacent to a VHF-FM radio receiver or transceiver. A brief test showed that while there is no interference to an FM radio on 88-108 MHz, there is still some interference caused to a nearby AM (medium frequency) receiver.

PCARA Foxhunt Rules

Saturday May 12, 2018

1. Transmission: FM simplex on 146.565 MHz, horizontally polarized.
2. Transmissions start at 3:00 p.m. for 5 minutes, followed by 5 minutes off. Second transmission commences at 3:10 p.m. 3 minutes on, 7 minutes off. The fox will not move during this time. This cycle repeats at 10 minute intervals until the last transmission ends at 4:30 p.m. when the fox will announce its location.
3. The opening transmission will include a time check for watch synchronization.
4. All contestants who wish to be eligible for a prize must book in at the **Beach Shopping Center parking lot***, in Peekskill before the start. Contestants will count as one team if more than one person occupies a car. (i.e. if three in a car, they don't get first, second and third prize.)
* on the far west side of the Shopping Center, near Jo-Ann/CVS.
5. No contestant is allowed to move his/her car until the end of the first transmission, so take your time with the first bearing and make it a good one. The transmission will be audible from the start without a super-sensitive receiver.
6. Radio silence will be maintained by all contestants on all frequencies from the first to the last transmission.
7. No excess mileage penalty will be incurred but all contestants are reminded at all times to stay within the law and observe speed limits, parking restrictions etc.
8. The fox will be hidden not more than 5 miles from the start. The location of the fox will not be on property which is inaccessible by car.
9. Upon a contestant finding the fox, please do not shout or in any way give the location away to other contestants. Report your name/callsign to the fox and retire to the place of refreshment immediately. This will ensure that other contestants do not discover the fox because a group of people is hanging around nearby. It is requested that you maintain radio silence even though the fox has been found and the fact that you have found the fox should not be revealed to anyone until the place of refreshment has been reached.



The fox will be hidden within 5 miles (red circle) of the starting point at the Beach Shopping Center.

10. The first competitor to locate the fox and positively identify him/her will be presented with a certificate. This competitor will be invited to assume the role of fox for the next foxhunt event.
11. Competitors should convene from 4:30 p.m. at the place of refreshment, which will be announced on-air by the fox.

Rules adapted from Bury Radio Society Fox Hunt
– Malcolm, NM9J

Church parade

PCARA was once again invited by Kathy (XYL of George N2LJO) to supervise parking for the 10:00 a.m. Easter Sunday Mass on April 1 at the Church of the Holy Spirit on Route 202 in Cortlandt Manor.

Volunteers this year included Bob N2CBH, David KD2EVI, Jared KD2HXZ, Al K2DMV and NM9J. Fr. John advised that parking on the grassy area above the church was permitted. Despite the extra space, the parking lot still filled to capacity and late arrivals had to be guided to alternative locations.

A short note appeared in the Parish Bulletin for April 8th acknowledging PCARA's contribution, along with guidance to the club's web site for those seeking more information.



L to R: Bob N2CBH, Al K2DMV, Jared KD2HXZ and David KD2EVI check their radios prior to parking coordination.

Smart meter update

As reported in the February 2018 *PCARA Update*, Con Edison is installing Smart Meters in our part of Westchester. These meters communicate with each other and with Con Edison access points using a mesh network in the 902-928 MHz license-free band.

Your editor's own smart meter was installed on March 19th by an Aclara technician who was carefully working his way down the street. The old meter was read and removed, the technician checked the supply with a tester then installed the new meter and recorded details on his portable device. Most



Smart meter installation into the existing meter housing.

— but not all — of the meters on my street have now been replaced. It is possible to opt-out of smart meter conversion, but you will then pay a \$9.50 monthly fee for bimonthly manual meter reading.

I checked for RF interference from the new meter with a portable AM/FM/SW receiver. There was a constant buzz on LW, MW and SW near the meter, but after moving a short distance away the noise disappeared.

At the same time as smart meters were being installed, wireless access points have been appearing in our area. They provide a link between the smart meters' 902-928 MHz mesh network and the wireless/cell wide area network to transmit consumption data to the power utility. So far, I have noted access points on Route 202 and on Lexington Avenue. Two of the Route 202 units are mounted on utility poles near the entrance and exit for Hudson Valley Hospital — take a look when you come to the next



Access point on Lexington Avenue

PCARA meeting. Here is a clue to identifying these access points — their own power supply is *not* metered, they are wired *directly* to the Con Edison 120V AC supply.



Close-up of access point. 902 MHz mesh antenna below, WAN/cell antennas on top.

Meter detail

The smart meter for domestic premises being installed for Con Edison is the Aclara (GE) model **I-210+c**, fitted with Silver Spring Technologies **NIC-511-03** wireless communication card.

Here is a description of this particular model from the New York State Public Service Commission's Order dated January 27, 2017, approving use of the Aclara meter by Consolidated Edison Company of New York, Inc. and Orange and Rockland Utilities, Inc.

— . . . —

The **I210+c/NIC-511** is a solid state electronic, programmable, socket-type electricity meter. The meter contains current sensing transformers that feed electric current signals to the I210+c/NIC-511 metrology engine. A circuit board within the engine contains an analog to digital converter that generates digitized values for the current input. The analog to digital converter reads current level at specific intervals, and these values are then processed using a digital signal processor to calculate energy consumption.



Exploded view of GE/Aclara I210+c smart meter. [After GE]

Energy consumption data is stored in the meter's non-volatile memory which can be erased and programmed repeatedly. This allows the meter to retain usage data during power outages. In addition, the meter is equipped with super capacitors that can store enough energy to enable sending an outage or meter failure signal to the utility.

Advanced meter functionality can be enabled by activating software applications in the I210+c/NIC-511 meter program. Available features include interval recording to support time-of use rates, load profile recording, and event logging for monitoring power quality. It can monitor energy both delivered to the Companies' electric systems and received by the customer from the electric system, to support net metering.

The I210+c/NIC-511 can receive firmware updates through radio transmission or by connecting a computer to the meter's optical port. It utilizes anti-tamper algorithm security features to detect unauthorized access, and requires an encrypted username and password to make firmware or software changes.

The I210+c/NIC-511 meter LCD display is configurable and can be programmed to display numerous meter functions. The I210+c/NIC-511 time stamps energy consumption data and end user site conditions, and transmits this information at regular intervals.

The Silver Spring Network Interface 511 wireless (902-928MHz) modular two way communication card included in the I210+c/NIC-511 can provide networking and AMI communications between the meter and the utility. The NIC-511 reads the amount of consumption directly from the meter register at regular intervals and transmits and receives data using a wireless mesh network; i.e., it communicates with other I210+c/NIC 511 meters. (Mesh networks relay a message by hopping from node to node until it reaches its destination, typically a collector connected to a fiber or telephone network.)

The I210+c/NIC-511 can be used with 120 volt and 240 volt alternating current applications for residential or commercial applications. It is available in forms 1S, 2S, and 12S, with a factory installed two hundred ampere electric service disconnect switch.



Aclara I210+c Electric Utility Watt-hour meter. Meter form is marked '3W FM2S' (three wire service, 240 volt single phase).

designate what type of service a meter is designed to serve; e.g. form 2S is used in 240 volt, single phase, three-wire service.) The electric service disconnect switch can be utilized to remotely disconnect and reconnect electric service, and can be used for electric service limiting applications during critical peak demand intervals.

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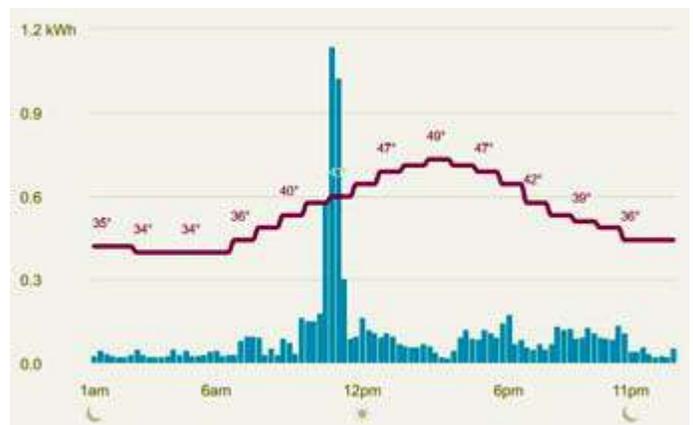
Watching the watt-hours

If you watch one of the new smart meters for a few minutes, there is a constantly changing sequence of labeled alpha-numerical values indicated on the liquid crystal display. As far as I can tell, the rotating sequence is as follows:

Display

Label	Display
888	Self-test to show all display segments working
99	'CLOSED' — service switch contacts are closed
51	Instantaneous power draw, unit kW
52	Previous interval demand (?), unit kW
05	Cumulative energy used since last reset, unit kWh
60	Fixed 5-digit code? bUSy : meter is communicating internally to the wireless option board (<i>not part of sequence</i>)

In order to take advantage of data collected by the smart meter, you will need to set up an online account with Con Edison. Start at <https://www.coned.com/en/pre-register>. After logging in to your new account, look under "Account and Billing" – "Energy Use History" to see the default choice "Energy Costs", which shows a graph of monthly charges. I changed the graph selection to "Energy Use" – "Day view" to see a new graph of how energy consumption varied during a single day.



Con Edison "Day View" consumption graph shows electricity consumption in kWh at 15 minute intervals. The spike before midday was caused by clothes drier operation. Red curve shows outdoor temperature in °F.

I could also "export usage for a bill period". The downloaded zip file expands to .csv format, suitable for reading into a spreadsheet program for further analysis.

- 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

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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 May 6: PCARA meeting, NewYork-Presbyterian /Hudson Valley Hospital, 3:00 p.m.

Sat May 12: PCARA Foxhunt, 2:30 p.m. for 3:00 p.m. start from Beach Shopping Center, Peekskill.

Sat May 19: PCARA Breakfast, Turco's, Yorktown Hts. 9:00 a.m.

Hamfests

Sun Apr 29: Orange County ARC Spring Hamfest, Wallkill Community Center, 2 Wes Warren Dr., Middletown, NY. 8:30 a.m.

PCARA Club table.

Sat May 19: Southern Berkshire ARC Hamfest, Goshen CT Fairgrounds, 8:00 a.m.

Sat May 26: Bergen ARA Spring Hamfest, Westwood Regional HS, 701 Ridgewood Rd, Township of Washington, NJ. 8:00 a.m.

Sun Jun 3: Mt Beacon ARC Spring Hamfest, Employee Rec Center, 83 Red Schoolhouse Rd., Fishkill NY. 8:00 a.m.

VE Test Sessions

May 10: WECA, Westchester Co Fire Trg Center, 4 Dana Rd., Valhalla, NY. 7:00 p.m. S. Rothman, (914) 949-1463.

May 14: Columbia Univ ARC, 531 Studebaker Bldg, 622 W 132nd St, New York. 6:30 pm, Alan Crosswell (212) 854-3754.

May 18: Orange County ARC, Munger Cottage, 183 Main Street, Cornwall NY. 6:00 p.m. Contact Joseph J. DeLorenzo (845) 534-3146.

May 20: Yonkers ARC, Will Library, 1500 Central Park Ave, Yonkers NY. 1:00 pm. Pre-reg. John WB2AUL, (914) 969-6548.

May 26: BARA Hamfest, Westwood Regional HS (Classroom #123), 701 Ridgewood Rd, Twp of Washington NJ, 8:00 a.m.



Peekskill / Cortlandt Amateur Radio Association Inc.
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