



# PCARA Update



Volume 18, Issue 2 Peekskill/Cortlandt Amateur Radio Association Inc. February 2017

## Breakfast activities

The 2017 PCARA Annual Bring and Buy Auction took place at the January 8, 2017 meeting at New York-Presbyterian/Hudson Valley Hospital. The auction was well attended but the amount of available *treasure* was somewhat less than that of previous years. Although the amount of items available was less, there were contributions made to the PCARA Treasury — thanks to some very generous members. THANK YOU!



PCARA's annual Bring & Buy Auction on Jan 8.

The first PCARA Breakfast was held on Saturday January 7, 2017 at Turco's in Yorktown. The meet was organized courtesy of Jared KD2HXZ and Lou KD2ITZ. There was so much interest; the PCARA Breakfast could become a bi-weekly event. Keep an eye on the PCARA Yahoo! Groups page ([https://groups.yahoo.com/neo/groups/Peekskill\\_Cortlandt\\_Amateur\\_Radio\\_Assoc/info](https://groups.yahoo.com/neo/groups/Peekskill_Cortlandt_Amateur_Radio_Assoc/info)) and/or listen to the Old Goats Net at 8:00 p.m. on Thursdays for updates.



PCARA's first breakfast at Turco's, Yorktown Heights, on Saturday January 7. L to R: Jared KD2HXZ, Lou KD2ITZ, Mike N2EAB, Lovji N2CKD and NM9J.

A PCARA Workshop Night has been organized by Lou KD2ITZ for Wednesday February 15, 2017, 7:00 – 9:00 pm. The location for the workshop will be the

Mohegan Volunteer Fire Association Headquarters at 1975 East Main Street, Mohegan Lake, NY 10547. Arrangements for use of the MVFA Headquarters were courtesy of MVFA member Barry, K2BLB. THANK YOU BARRY! A series of suggestions for the workshop were discussed during recent Thursday Old Goats Nets, and can be found in this month's edition of the PCARA Update in an article penned by Lou, KD2ITZ. Please consider joining us.

A PCARA Foxhunt will take place during the Twentieth Annual CQ World Foxhunting Weekend of May 13 - 14, 2017. Details will become available as the event approaches. What we can be sure of is that the role of the Fox will be played by Mike N2EAB. Mike has played the Fox on a few other occasions and has proven to be a very sly, crafty, cunning, clever, shrewd, and wily Fox indeed! So, be on your best game!

Our next regularly scheduled meeting is **Sunday February 5, 2017** at 3:00 p.m. at New York-Presbyterian/Hudson Valley Hospital in Cortlandt Manor, NY. I look forward to seeing each of you there.

- 73 de Greg, KB2CQE

## PCARA Officers

President:

Greg Appleyard, KB2CQE; kb2cqe at arrl.net

Vice President:

Joe Calabrese, WA2MCR; wa2mcr at arrl.net

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## 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. Join net control Karl, N2KZ for news and neighborly information.

# Adventures in DXing

- N2KZ

## Unknown Territory

If you know amateur radio you know that there is always something new to discover. When was the last time you went to a place you had never been before? I dared to delve into new territory. My new Yaesu FT-60 HT is the first device I have ever owned that can receive the 1.25 meter band — 222 to 225 MHz — so I started to scan to see what I could hear.

If you were ever curious about operating or listening to hams in the 220 MHz band... here is a concise list of some 1.25 meter repeaters you can try in our area. Thanks to Malcolm, NM9J, Bob N2CBH and Larry, W2LGB for their help. Note: 220 repeater offsets are usually 1.6 MHz minus. For example: If the repeater output is 224.400 MHz, the input would be 222.800 MHz. Don't forget to enter the appropriate PL tone frequency... here's the list:

|               |        |         |   |          |
|---------------|--------|---------|---|----------|
| Carmel        | KC2CWT | 224.020 | – | PL 136.5 |
| Harriman      | WA2LVY | 223.800 | – | PL 107.2 |
| Mt. Beacon    | W2GIO  | 223.920 | – | PL 100.0 |
| Mahopac       | NY4Z   | 224.700 | – | PL 141.3 |
| Nyack         | WA2MLG | 224.380 | – | PL 114.8 |
| WECA Valhalla | WB2ZII | 224.400 | – | PL 114.8 |
| RRA Pomona    | N2ACF  | 223.820 | – | PL 114.8 |

By far, the most activity can be found on the KC2CWT repeater on 224.020 MHz from Carmel with a 136.5 PL. The input frequency is 222.420 MHz. Besides that, there is some activity heard on the repeaters of familiar local clubs like WECA and Rockland's RRA (Rockland Repeater Association.) Look for them at <http://weca.org/> and <http://rra.net/>.

The Carmel 220 repeater features links to Echolink and IRLP. When you hear the Carmel repeater use a Morse 'L' as a courtesy tone, you know the Echolink link is on. People arrive on Echolink from all over the country and around the world, so you can hear some pretty interesting QSOs. KC2CWT/R operates with a 100 watt signal so it is easy to hear all over our area. You'll hear it recite the correct time every 15 minutes.

Going to even a further depth, I managed to find a receiver that covers the 33 centimeter band — 902 - 928 MHz — including the 927 MHz repeater band. Here the repeater split is an enormous minus 25 MHz! A good friend at work had a Uniden Bearcat BC80XLT scanner that he bought for a song at a flea market in Florida a few years ago. When Sam first got it, I demonstrated how to use it and loaded it with frequencies he could hear by his home in Rockland County.



*Karl's Yaesu FT-60 handi-talkie (left) receiving 224.020 MHz, while the Uniden BC80XLT scanner is tuned to 927.850 MHz.*

an analog scanner, but it hears lots of signals from 10 meter FM all the way up to repeaters on 927 MHz. Wow.

So far, my 33 cm DXing has been limited. The only repeater I have been able to hear with the provided rubber duck whip antenna has been the Rockland Repeater Association's machine on 927.850 MHz operating with 160 watts into a Station Master antenna. Use a 114.8 PL when trying to reach it.

I understand that 33 cm is also a desirable band for amateur television although I haven't seen any indication of activity in the New York metropolitan area. There is also another 33 cm analog voice repeater on The Empire State Building operating on 927.6875 with a digital PL of D532. This repeater's custodians are a couple of broadcast engineers: Tom W2RN and Jim K1NK. Adventure is out there. You just have to look for it!

## Get Down

Adventure is not limited to the heights of our spectrum space. One recent evening, I was scanning the land below the AM broadcast band for beacons with continual Morse IDs. Stepping down from 530 kHz, 1 kHz at a time, I stopped at 471 kHz. What's this? Imagine how surprised I was to hear a beacon with what sounded like an amateur radio call! The slow code message was really interesting: WG2XSB FN42 STOW, MA FARADAY CAGE. What did it mean?

Years later, Sam handed it back to me and said 'Merry Christmas.' Since I appreciate crazy receivers like this, I should use it! Thanks, Sam! After experimenting with it for a day or so, I noticed that it had an extended range all the way out to 956 MHz.

The Uniden Bearcat BC-80XLT handheld scanner was a fancy model when it was first released in 1995 selling for about \$174.95. Fifty channels with very rapid scanning and nice wide coverage, it was a delight to enjoy. It still is! With triple conversion and a quality design, it may be just

A bit of Internet searching brought me some of the details. WG2XSB is an experimental FCC license issued to Ted Robinson K1QAR.



630 meter experimenter Ted Robinson, K1QAR is pictured at NEAR-Fest with a large vacuum variable capacitor.

FN42 is obviously a Maidenhead grid square very familiar to any VHF or UHF DX enthusiast. It seems Ted is a big boat anchor specialist who loves to restore old

tube gear like the classic R-390 receiver. His shop is at the Minuteman Airfield right in Stow, MA. I sent a report to the e-mail address for Ted posted on QRZ.com and received a quick reply. Cool!

*'Thanks for taking the time to give the report. Antenna is a 75 meter loop up 60' fed against ground with a 175  $\mu$ H loading coil. Transmitter is a Juma running 40 watts. CW Forever. 73, Ted, K1QAR (3885 AM usually) WG2XSB 471 Kc.'*



The Juma TX500 is a digitally-controlled 60 watt CW transmitter from Finland intended for the 630 meter band.

Could you ask for anything more? Certainly, one of my best DX loggings. Merry Christmas! Shortly after, Malcolm, NM9J, logged the WG2XSB beacon, as well.

During the same listening session, I heard an impressive bunch of more traditional beacons from North Carolina, Michigan, Indiana, Ontario, Quebec, New Brunswick, Kentucky and New Jersey. The sunspots might be quiet up on HF, but on long wave the conditions could not be better! All this with my modest Sony ICF-SW7600GR portable connected to a 30 meter dipole! If you have never tried long wave DXing, give it a try! It is a great way to brush up your Morse Code reading. Long wave beacons send their Morse IDs very, very slowly!

### Mariachi Static

It was just like the good old days of analog television. In early summer and for a short time in the middle of December, wonderful E-skip would delight

TV DXers. Channels 2 through 6 and above would fill with roaring heterodynes over big local broadcasters and roll and spin over and over again on local empty channels 3 and 6. What fun!

The conversion to digital TV has silenced most of this tradition. The six meter ham band is usually the lone survivor for enjoying this propagation. There are exceptions to this rule!

I was out walking my dog Gomer listening to my trusty Sony SRF-M37V Walkman radio that offers TV sound reception on VHF TV channels 2 through 13. I haven't heard anything there in a long time! I was listening to AM radio and hit the band switch in a quick pull of the leash. Suddenly I hear the John Lennon tune 'Happy Xmas (War is Over)' except it is being sung in Spanish. What on Earth is this?



Sony SRF-M37V Walkman radio receives AM, FM, analog VHF TV audio and NOAA weather.

The deep fades and singing interference gave it away. It was obviously E-skip. I quickly bounced through channels 2 though 6. Channels 2 and 3 had really strong roaring noise but no discernible signals. Channels 5 and 6 were smooth static. Channel 4 continued with really strong Christmas carols again in Spanish along with short announcements in-between songs.

Sob. My reception will always remain a mystery. It faded out before I ever heard a solid identification. If I had to guess, it would have to be from Cuba. There are three channel 4s in Cuba: Tele Rebelde from Camagüey and Holguín and Canal Educativo from La Habana (Havana.) Still, I have to thank Gomer the dog for bringing it to my attention!



### Korean Morse Code

This may be the year 2017 but Morse code is still everywhere. My daughters recently studied in Korea and developed a passion for 'Kpop' — Korean pop music. One of the most popular groups, a boy band known as Seventeen, just released a new CD album set called 'Going Seventeen.' It comes in three versions that are really elaborate. You get the music CD, a beautifully published full color booklet, two posters, two photo-cards and a bookmark. Of course, to get all the goods you have to buy all three versions. This marketing scheme seems to work with their fans. They sold 130,000 copies in the first week.

As my daughters were looking over Seventeen's new release, I noticed that the contents had a nautical theme. I flipped over one of the photo-cards and noticed there was a message in Morse Code.

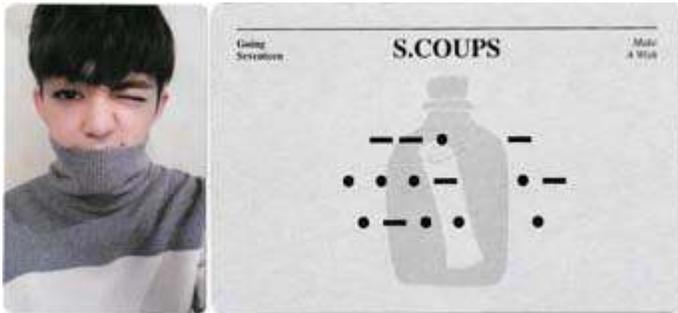


Photo-card included with latest album from South Korean boy group 'Seventeen' shows group leader S.Coups on the front with a Morse message on the back.

There was a problem. The message made no sense: G T - V A - L E. After a little thought, it occurred to me that the Morse was in Korean and not in standard letter-by-letter text. I looked online and found a conversion chart from Morse to Korean Hangul script.

My daughters provided the translation. Each Korean language symbol combines with another to make parts of a phrase. You'll always see a consonant followed by a vowel. Each line on the back of the card represents one part. GT forms 'suh' - VA forms 'ro' - LE forms 'ga.' All together, the phrase means 'together!' I would love to hear what Korean Morse sounds like over the air! Morse is everywhere — but I have never seen it used like this before!

|   |       |   |         |
|---|-------|---|---------|
| ㄱ | · · · | ㅏ | ·       |
| ㄴ | · · · | ㅑ | · ·     |
| ㄷ | · · · | ㅓ | ·       |
| ㄹ | · · · | ㅕ | · · ·   |
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Conversion chart from Korean language symbol to Morse code.

### Goats and More

Now celebrating its tenth year on the air, PCARA's Old Goats Net is waiting for you every Thursday night at 8:00 pm on the PCARA repeater at 146.67 MHz with a minus 600 kHz offset and a 156.7 PL. Please join the fun! Keep in touch with the very latest PCARA news by visiting our Facebook page and our Yahoo Group. Stay warm and see you on the air!

- 73 de N2KZ Karl dit dit.



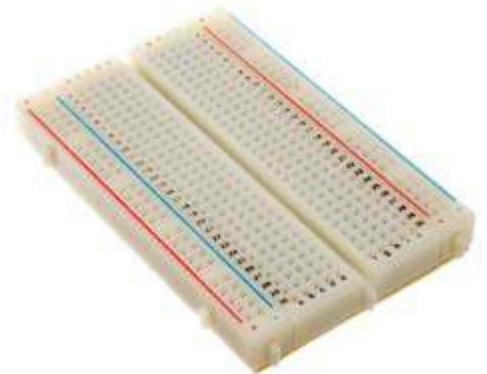
## PCARA TRACCS Workshop - KD2ITZ

On Wednesday February 15, 2017 from 7:00 to 9:00 p.m., PCARA will be offering an evening of Testing Radios and Antennas, Circuit Construction, and Show-and-tell (TRACCS). The PCARA TRACCS Workshop will be held at the Mohegan Volunteer Fire Association Headquarters on 1975 East Main St. (Rt. 6), Mohegan Lake.



Mohegan Volunteer Fire Association HQ, near the intersection of Route 6 and Lexington Avenue, is the venue for PCARA's upcoming 'TRACCS' workshop.

Participants are encouraged to bring transceivers for testing on a service monitor and antennas for testing on an antenna analyzer. Instructions will be provided for the construction of a number of useful circuits with varied levels of difficulty including an audio amplifier and a CW oscillator for Morse code sending practice. No soldering experience is necessary and circuits can be made on solderless breadboards.



Solderless breadboard, as used in construction projects and for testing circuit designs.

Anyone wishing to construct the circuits at the event should send an email to the address below for a parts list and information

about group purchasing. Purchase orders must be received by February 5, 2017. Participants who wish to work on other projects are most welcome.

Don't forget to bring completed items for show and tell. PCARA would like to thank Barry K2BLB and Bob N2CBH for their assistance. All are invited, but space is limited. Reservations are required. RSVP to Lou, KD2ITZ: radiocassetta '@' gmail.com . - Lou, KD2ITZ

# A cootie? – N2HTT

[This article is reproduced with permission from Mike, N2HTT's blog site, <https://n2htt.net>. –Ed.]



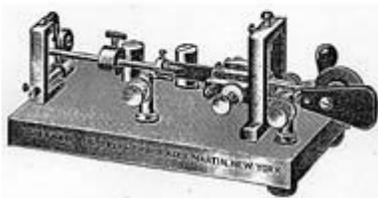
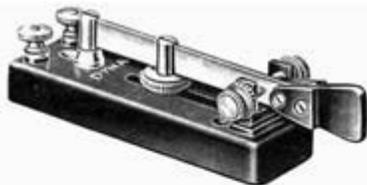
## I've got a little list

Settling in for the long winter season, I have lots of bench projects waiting in the queue. Some have time constraints and are higher priority, such as getting my Heathkit HX-1681 back on the air in time for this year's Novice Rig Round-up (Feb 18 - Feb 26, 2017, see <http://novicergroundup.com/>). Others, like finishing the one tube regen I started, or repairing half a dozen broken items, will rise to the top of the list in due time. And there are some new home brew ideas I am eager to start, definitely including another QRP tube transmitter this year.

So with all these worthy items awaiting attention, how do I spend the little bench time I had available over the last two weeks? I built a cootie key, of course.

## Side to side

A cootie key, or sideswiper as they are also called, is a key that is operated with a horizontal motion of the hand, rather than the up-and-down motion of a straight key. It has two contacts, left and right, and — unlike a paddle — a key closure on either side closes the same circuit. Cooties go way back; they were the first attempt to solve the problem of “glass arm” (what we call a repetitive strain injury today) which was the frequent result of too much straight key activity. It is said that the first cooties were made by enterprising telegraphers who mounted two straight keys base-to-base on their sides, with the keys wired in parallel. Later, commercially made cooties appeared, touting less fatigue and faster keying speed as advantages.



Top — Maniflex ‘Cootie’ key or side-swiper. Below — Vibroplex semi-automatic key or ‘Bug’.

electronic keyers and the paddle, which uses two separate circuits for the dot and dash, have pretty much relegated bugs and cooties to the attic, to be used only

by aficionados of retro and antique gear. [That ‘Cootie’ name suggests something even *worse* than a semi-automatic ‘Bug’. –Ed.]

But there is one other group of hams who have traditionally embraced the cootie: those seeking a key for next to no cash outlay. Cooties can be made out of any piece of springy steel and two contact points. Hacksaw blades are commonly used, but I have seen pictures of cooties made from steak knives jammed point first into a block of wood!

(<http://www.sideswiper.net.org/keys/nt9k-keys.php>). This is a technology that lends itself to improvisation, and that is what ham radio is all about.



Steak-knife cootie key.

## Swing to the left

Sending with a cootie, or side-swiping, is a tricky business. Basically, you start each character on the same side of the key (I'm right-handed, I start with my right index finger first), and then alternate thumb and finger creating the elements of the character. The timing is all on you, much as it is with a straight key. I found the technique difficult at first, but with some practice still find it difficult. My inclination is to start each character with whatever finger was left over after completing the last, but I can see that method quickly leads to disorganization and madness. The always start-on-the-same-side approach makes sense if you think about each character as a separate unit, always formed the same way. Harder to learn, but I think you get a better sounding result.

I have actually owned a very fancy cootie key for some time now, made by *Llaves Telegraficas Artesanas* (LTA) in Spain. The gentleman who made these keys, Guillermo Janer, EA6YG, has been a silent key since 2008, but you can still see a very nice page describing the keys he made at Morse Express, <http://morsex.com/hta/index.htm>.



LTA cootie key, mounted on a chunk of granite countertop [N2HTT pic].

This key is beautifully crafted, but really awkward to use. With the pivot in the center the throw is short, and the stiff brass arm has no give upon making con-

tact, making for a very jerky feel when keying. After several tries to get used to it, I gave up and it sits very handsomely on the shelf where I display my key collection.

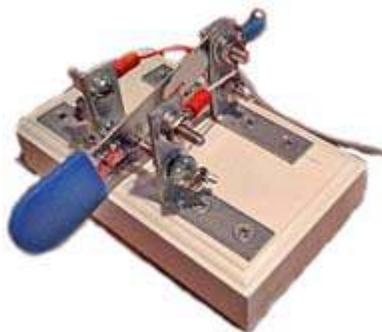
I got interested in cooties again when just recently one came up for sale on a club swap-meet listing. This was a cootie made by Vizkey, <http://vizkey.com/>. It gets excellent reviews, and I got intrigued. The Vizkey version is based on the venerable hacksaw blade which simultaneously provides the contacts and the spring tension for the key. These keys are a bit pricey though, and I wondered if there was a way to experiment with cooties that would require less commitment.



*Viz-Cootie key from Vizkey.*

**Home(brew) depot**

On to steak knives and blocks of wood... I researched inexpensive home brew options, and came up with this really nice design by Mike Maynard, KC4ICY. His **Depot Key**, [http://www.k4icy.com/wkend\\_radio\\_depot\\_cootie.html](http://www.k4icy.com/wkend_radio_depot_cootie.html), so-named because all the parts can be obtained from, well, you know. Anyway it looked like a nice inexpensive way to play with a cootie, and



*Depot cootie key.*

being based on a hacksaw blade I figured it would be pretty much the authentic side-swiping experience. Mike estimates that his version of the cootie can be built for about \$10.00. I think the actual number is closer to \$20.00, but I didn't have any old hacksaw blades handy and the Depot only had packages of two available. I did have most of the rest of the hardware on hand, as well as the wooden base (leftover from the external VXO project) and the wood finishing supplies (leftover from the Bayou Jumper.) I bought the angle irons, the



*Components specified for the KC4ICY Depot Key include a 1/2" hacksaw blade and four 1 1/2" galvanized corner braces.*

hacksaw blade, and the 1/8" stereo plug which I was out of at the moment. And the buttons for the finger pieces.

My first attempt at finger pieces was to cut out two rectangles from a heavy polyethylene container. They looked awful, so I went searching through the craft department of our local Walmart, and found a package of six really cheap coat buttons for \$2.00. The buttons had flat backs so they fit together nicely around the hacksaw blade, and a #6 bolt fit the hole perfectly.



*Coat button finger pieces. [N2HTT pics.]*

Construction was very straightforward. I cut the hacksaw blade to length using a pair of tin snips (don't forget the safety goggles when working with springy steel), and drilled a hole near the cut end to accommodate the finger-piece attachment. The blade was a little tough to drill, but no big deal really, just go slow and perhaps use a drop of oil on the bit. I used a wire brush in my Dremel tool to remove the paint from the hacksaw blade, as it was a rather garish white and yellow color scheme.

In a departure from Mike, KC4ICY's design, I added a bolt across the top of the angles holding the contacts, so I would only have to wire one side. This eliminates the possibility of using the key as a single lever paddle, but adds some rigidity to the contact posts.



*Cable strain relief consists of a staple and dab of hot-melt glue.*

The only other feature I added was a staple and a dab of hot glue to act as a strain relief for the cable, which is a short length of RG-174 coax.

I put a piece of non-skid foam backing, (the kind used under rugs) on the underside, held in place with a few pieces of double-sided Scotch tape. Although the key is very light, this arrangement holds it in place just fine, and there is no need to hold the key with your other hand while keying.



*Non-slip rug backing.*

## In practice

So how does it play? Not bad, actually. The springiness of the blade, and the soft landing with a little give on the contacts is very pleasant. It makes a little noise when keying, but not nearly as bad as the *LTA* key, which clanks dramatically with each stroke.

I've been practicing off the air with it, and while I like the feel and the side-to-side keying, I still sound pretty awful. There is a tendency to run the dits together, and shorten the dahs. Based on Internet advice, I set the contacts pretty far apart — this is supposed to help avoid the running together.



Mike's completed "Depot" Cootie Key [N2HTT pic.]

There are many online resources on the art of side-swiping — the SideSwiperNet website <http://www.sideswipernet.org/> lists nets and other information, and has a gallery of keys posted by cootie aficionados that is very interesting to browse through.

You can also find a short essay on the practice of side-swiping at Morse Express <https://mtechnologies.com/cootie.htm>. They also feature another commercial cootie, the GHD GF501A — a pricey but beautiful instrument. (See the bottom of the 'Paddles' section on the GHD page, <https://mtechnologies.com/ghd/>)



The GHD GF501A cootie key — a single lever paddle by JA7GHD.

I like my homely little cootie, and will continue to play with it — maybe even venture out onto the air someday if my sending with it ever becomes comprehensible. I did get to satisfy my side-swiping itch without investing in an expensive instrument — dodged the bullet on that one.

– 73 de Mike, N2HTT

## Write an article!

Your editor is always grateful for articles that are submitted to the *PCARA Update* newsletter. Whether submitted each month — or only on an occasional basis — articles from members are always welcome, ensuring our pages will be filled with interesting ideas.

But we need more articles from readers who have *never* written for the newsletter before. Could **you** be our next contributor? Of course you could! Here are answers to a few questions you might have.

**What should I write about?** Almost everyone in Amateur Radio has a story to tell. It might be about how you were introduced to the hobby, or an account of your 'Elmer' or a visit to an outstanding Hamfest. If you are a seasoned constructor, you might want to describe a recent project. If you prefer factory-built equipment, write a review of your most recent acquisition. Make notes as you go along, take photos, then put it all together.

**What about writing style?** Some people have a natural style which is perfect for the newsletter and requires little or no editing. If you have not written a report or an article in a while, then put yourself in the situation of the reader. What would your reader like? Do you need to set the scene before you begin the main part of the article? Do you need to explain any new, technical terms? How would you sum up the overall experience in a closing paragraph?

Don't worry about occasional language lapses. It's the editor's job to fix these and check any doubtful facts before the newsletter is published.

Send your text without pictures — preferably as a Microsoft Word format file (DOC, DOCX). Other formats can also be handled.

**What sort of photos and graphics?** A picture is worth a thousand words — or roughly 40 thousand bytes in each newsletter PDF! So — take digital photographs. Send your pictures as separate JPG files rather than incorporating them into the text file. Older photos on photographic paper can always be scanned.

If you are photographing radio equipment, try to isolate it from the general clutter in your shack. A plain white or gray background is best. Your editor keeps a sheet of white poster board nearby for photographing radios and components. Take care with lighting. If you use flash, shoot at an angle to avoid direct reflections off shiny surfaces. Graphics can be sketched by hand then scanned — the editorial department can redraw simple diagrams in digital form.

- NM9J



# Blueberry Pye



## Basement find

I was moving equipment down to the basement recently when I came across a long-lost item. Curious about the contents of a United Van Lines removal box, I flipped open the lid and found an old Field Strength meter inside. Beneath I saw a glimpse of metallic blue paint. Pulling off the wrapping paper, I realized it was a Pye 'Cambridge' that had crossed the Atlantic with me, 30+ years ago.



## Blue background

Pye Telecommunications Ltd was a UK company headquartered in Cambridge, fifty miles north of London. The company was formed as a subsidiary of broadcast radio and TV manufacturer W.G. Pye & Company to manufacture radio communication equipment during World War II. Pye Telecom became the UK's leading manufacturer of two-way radio equipment from the 1950s into the 1980s. They also had a healthy export business, especially to Commonwealth countries such as Australia.

Pye Telecom has been mentioned before in the pages of *PCARA Update*. See "Cambridge gold" June 2012 pp 5-8 and "Anyone for 4 metres?" September 2013 pp 5-9.

Pye Telecom's 'Cambridge' mobile radiotelephone was introduced in 1963 with several improvements over its predecessor 'Ranger'. The 'Cambridge' receiver was all solid-state — something that only became possible in the early 1960s with the introduction of low-noise germanium transistors for VHF. Mullard's AFZ12 was the device used in its RF amplifier stages.

The Cambridge receiver could be left on for long periods of time without discharging the vehicle battery — receiver drain was only ¼ amp. This was less than one-tenth the drain of a Pye Ranger, with its vibrator power supply and vacuum-tube receiver. The Cambridge had a transistorized modulator and DC converter, further reducing battery drain on transmit. Power output was 5-7 watts AM over 25-174 MHz. Chassis, case, covers and die-cast front panel were all aluminum, for an overall weight of 10½ pounds, less than half the weight of a steel-chassis Pye Ranger.



*Pye 'Cambridge' Radiotelephone as pictured in publicity brochure.*

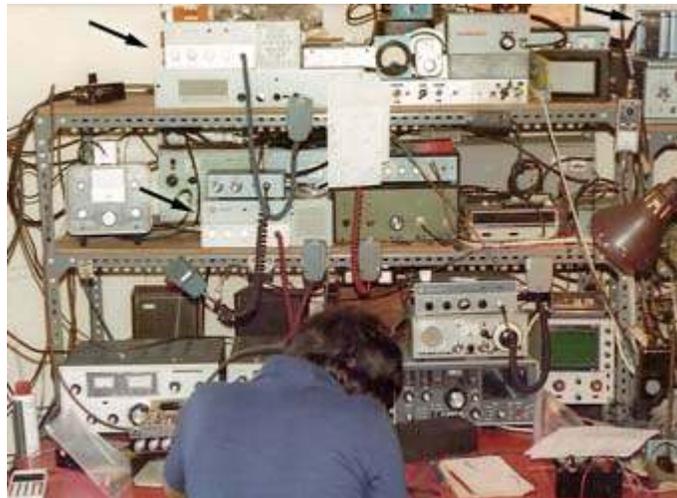
The Cambridge was a much more reasonable size and weight for dash-mounting than the Ranger. Both radios were finished in an attractive metal-finish enamel which the Pye History Trust reports as "Dimenso Blue", see <http://www.pyemuseum.org/>. For covering the inevitable scratches on used equipment I kept a supply of "Hammerite" blue hammer finish and a can of Cambridge Blue car touch-up paint on-hand.

## Super seventies

Private Mobile Radio (PMR) equipment became popular with British radio amateurs during the 1970s. There was a growing interest in VHF and UHF operation, at a time when little commercial equipment was available for the amateur bands. Existing PMR radios were being made obsolete by narrow channel spacing — from 25 kHz to 12½ kHz on VHF — and by conversion of services from AM to FM. PMR equipment was built to high standards, free of spurious emissions and sufficiently rugged to withstand rough use in a variety of vehicles. New prices were high, but values fell dramatically when resold into the amateur market in a used state. The introduction of FM repeaters with channelized operation made surplus equipment even more desirable for the radio amateur, at a time when low-cost synthesized radios had not yet arrived from Japan.

## Radio rediscovered

When I pulled that old Pye Cambridge out of the removal box, it was like meeting an old friend — but I was not sure of its condition or of the amateur band it might have been used on. I owned several Cambridges during the 1970s — for "high band", "low band" and UHF.



*G3VNQ shack of 1978 included three Pye Cambridges (arrowed) for the 145 MHz, 70 MHz and 430 MHz bands.*

Before leaving Britain for the Chicago suburbs, I sold most of my incompatible equipment, but a few items went unsold and followed me across the Atlantic.



*Pye Cambridge shortly after being taken out of storage.*

The first frequency clue came from the blue press-to-talk microphone, which bore a Dymo label '70 MHz'. The second clue came from the metal serial plate on the side of the set, which revealed the catalog number: "PTAM10DV", with original transmit and receive frequencies of 86.625 MHz. So this was a low-band **AM10DV**, where AM = amplitude modulation, 10 = 10 watts nominal input power, D = dash-mount and V = 'very narrow', 25 kHz channel spacing. Frequency band was **E**, 68 - 88 MHz.



*Serial plate on side of the Pye Cambridge shows catalog number, serial number, voltage and frequency information.*



*Close-up of modified front panel controls.*

on the front panel. That would be my own work as I had converted several radios from single channel to multi-channel operation. Removing the top cover revealed sufficient HC6/U sockets for four channels, with just one pair of quartz crystals installed. The marked frequencies showed the radio had been set up for simplex operation on the UK's four meter national mobile calling frequency, **70.26 MHz**.



*One RX and one TX crystal were installed.*

## Discerning design

Mechanical design of the Cambridge was highly adaptable. The diecast front panel had holes for three or four rotary controls. To convert a single channel radio with



*View below chassis shows front panel with rotary controls for (L to R): volume, squelch, 6-way channel switch and power switch. Center hole is no longer used.*

three control knobs to switched channel, you removed the aluminum escutcheon, moved the center squelch control to the new hole on the left then mounted a rotary channel switch through the new hole revealed on the right. I had replaced the original three-hole escutcheon with the correct four-hole part then re-labeled it using Letraset dry-transfer lettering.

Another aspect of Cambridge design was use of separate printed circuit boards for seven different stages of the receiver. Here is the list:

- R.F. Unit (R.F. amplifier, crystal oscillator and mixer)
- First I.F. Unit (10.7 MHz)
- Second Mixer Unit (with 11.155 MHz crystal oscillator)
- Sealed Block Filter (455 kHz)
- Second I.F. Unit (455 kHz)
- Squelch Unit
- A.F. Section (used for transmit and receive)

This modular approach made it relatively easy to service the radio. The same chassis could be used for different frequency bands and for amplitude or frequency modulation.



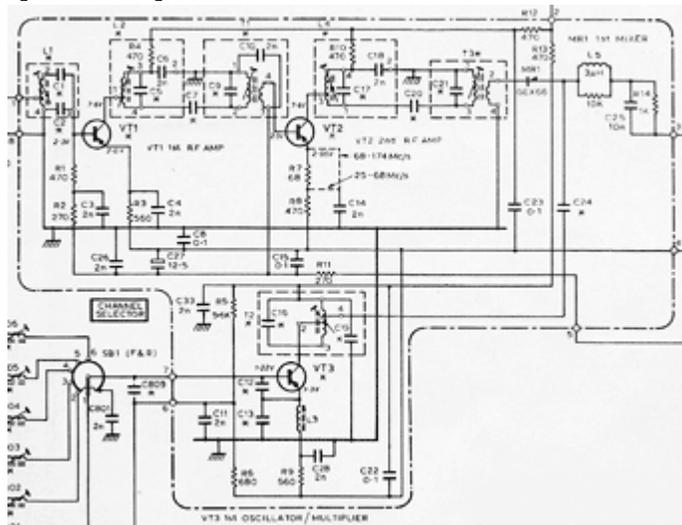
*View above chassis shows the A.F. Section and Second I.F. Unit boards hinged-up, revealing the blue Block Filter, lower left.*

Channel spacing could be modified by choice of block filter. The same circuit boards were re-used in Pye base stations, in the trunk mount model AM10B, in the higher power Vanguard AM25T and in the UHF FM trunk mount Cambridge, type U10B. (**B**=boot, UK term for trunk).

This flexibility meant the Cambridge could be readily adapted to amateur radio. The high band model (Band A, 148-174 MHz) could be moved down to 2 meters — 144-146 MHz in the UK — by increasing the value of various capacitors in the receiver R.F. Unit and in the transmitter circuit. A further modification improved sensitivity by replacing the front-end AFZ12 RF amplifier transistors with more modern AF139 or AF239 types, intended for UHF television reception. The R.F. Unit incorporated **two** R.F. amplifier stages, followed by a diode mixer. There were *five* high-Q tuned circuits between antenna and first mixer, for freedom from spurious responses.



1st RF amplifier transistor VT1 (arrowed) on the R.F. Unit board was changed from an AFZ12 to low-noise UHF type AF239.



Schematic of Pye Cambridge R.F. Unit shows the 1st and 2nd RF amplifier stages (top left), followed by the diode mixer. Crystal oscillator/multiplier stage is bottom left.

The low band model (Band E, 68 - 88 MHz) did not need any capacitor changes to reach the four meter amateur band, which extended from 70.025-70.7 MHz.

### Pye policy

The majority of Pye equipment supplied for VHF private mobile radio in the 1950s-60s was designed for *amplitude modulation*. Pye believed that AM provided better performance than FM when signals were weak — which was often the case with the low-powered mobiles of the time. And AM would provide an easier path to narrow channel spacings such



as 12.5 or 6.25 kHz. At the same time, wide-area coverage schemes for police, fire and air traffic control depended on multiple **AM** transmissions from hilltop sites, with slightly different carrier frequencies that were offset from the nominal center frequency.

The mid 1970s was a time when U.K. radio amateurs were busy changing from AM to FM on VHF and UHF. My Pye Cambridge from forty years ago bears witness to this change, with two miniature toggle switches mounted on the front panel, labeled AM/FM for both RX and TX.



Front panel switches select between AM and FM.

### Holy conversion

Converting the AM Pye Cambridge to dual mode AM/FM was carried out in two steps. On the receive side, a 455 kHz signal was picked up from the 2nd IF board, then routed to a new circuit board containing an SN7660N or TBA120A integrated circuit. These ICs had been developed for analog TV receivers with 4.5 - 6 MHz intercarrier FM sound. The design featured a high-gain limiting amplifier to remove any amplitude modulation caused by the video signal, followed by a quadrature detector for FM. The demodulator only required a simple tuned circuit with adjustable coil, resonant on the intermediate frequency.

For this particular 'four meter' Cambridge I had used a small circuit board supplied by Garex Electronics



Garex FM detector board mounted in Pye Cambridge in place of the Squelch Unit.

that occupied the same space as the original Squelch Unit. At the time, Garex Electronics was owned by Peter Longhurst, G3ZVI and specialized in modifying and re-selling Pye equipment.

**GAREX (G3ZVI)**

BRITISH MADE V.H.F. EQUIPMENT

**TWOMOBILE      FOURMOBILE**

Companion units for 2 or 4 metres. They feature Tx, Rx and PSU for 12V DC (inst in a single unit 19 x 8 x 2 1/2"). Full coverage tunable AM/FM Rx with

**GAREX FM detector conversion** ready assembled with full fitting instructions. Tailor made, easy-fit design for AM Cambridge, replaces squelch board with minimum of other modifications, **£5.40**. Transistor Vanguard (AM25T) version with modified squelch circuit, **£5.94**. Suitable for most rx's with 450-470kHz IF. See details.

Garex advertisement from the July 1977 edition of Radio Communication, journal of the RSGB.

The Garex board included an AGC-derived squelch circuit which was used for both AM and FM. Care was needed with the DC power connection as the 12 volt

DC supply is fully isolated from the Cambridge chassis. This allowed the radio to be used in older vehicles from the 1960s with positive ground as well as newer vehicles with negative ground connection for the battery.

The second conversion step was to add frequency modulation to the AM transmitter. I had tried modulating the screen of a crystal oscillator tube in the past — but different crystals would provide different amounts of deviation. The solution was to apply *phase* modulation to one or two stages *after* the crystal oscillator. I found a surplus FM Oscillator/Multiplier unit for the Pye Cambridge available from A.J.H. Electronics, run by Tony Hibberd, G8AQN.



*A.J.H. Electronics advertisement from July 1977 Radio Communication.*

This unit replaced two 6BH6 vacuum tubes for crystal oscillator and first multiplier. The new board was mounted in the space below chassis previously occupied by two B7G tube sockets. Additional circuitry for audio filtering and deviation control was installed in the space above the holes.



*A.J.H. Electronics phase modulator board installed in the modified Pye Cambridge.*

### Would it work?

The vintage Pye Cambridge was in remarkably good condition when I inspected it in the radio room. The aluminum chassis was clean, the circuit boards showed no sign of corrosion and the hand-wiring was still in good shape. I connected a 12 volt power supply and switched on. The green “receive” lamp lit and adjustment of the squelch and audio gain controls produced noise from the loudspeaker — followed by audio from a 70.26 MHz test signal. This was encouraging!

I could not connect an external antenna to my Pye Cambridge for an on-air test as the U.K. 4 meter band, (70.0-70.5 MHz) is not authorized for amateur use in the U.S.A. — it lies wholly within U.S. TV channel 4, 66-72 MHz. Instead I connected my Welz power meter and a well-shielded dummy load to the antenna socket. Moving the power switch from **RX** to **S'BY** to warm up



*Testing power output from the 70 MHz Pye Cambridge after 30 years in storage.*

the tube filaments, I operated the press-to-talk switch on the Pye microphone. I was rewarded with a full **7 watts output** on the power meter. This was even more encour-

aging — bearing in mind that the QQV03/10 (6360) dual-tetrode power amplifier tube was not new when I obtained this radio in the 1970s!

I tuned my Icom IC-706MkIIIG to a frequency of 70.260 MHz in order to monitor RF output. Transmission was still on-frequency and both modulation modes were audible — with the usual good communications quality that I remember from Pye Cambridges.



*Mullard QQV03-10 output tube from the Pye Cambridge.*

### Rely on Pye

I had a lot of fun modifying Pye equipment in the 1970s. Surplus PMR transceivers from that era had full-size components that were easy to work on, with tubes and circuit boards mounted on a readily accessible chassis. But we need to put this 50 year old equipment into perspective...

Pye equipment from the 1960s was largely hand assembled, with multiple printed circuit boards populated by hand, wave-soldered, mounted in the case and interconnected on a long production line. The result was rugged, flexible equipment that could survive rough treatment in repair trucks and patrol cars. But the cost of all those separate components and the skilled hand assembly was high.

In a few years' time, Pye would follow other manufacturers by going all solid state, incorporating integrated circuits into their designs and mounting circuitry on a single printed circuit board that could be mass-produced. This reduced cost, size and power consumption; increased reliability and allowed more complex circuitry — including frequency synthesis.

Amateur Radio benefited from these same techniques, with the added attraction that our equipment had an S-meter, could operate in VFO mode and then store favorite frequencies in memory channels. I would not go back to the old days of 5 watt mobiles drawing 5+ amps from the battery and requiring regular tube changes. But it's good to reminisce about those simpler times.

- G3VJNQ, NM9J

# Goodbye good friend

- N2KZ

Finn O. Poulsen, Wappingers Falls, died peacefully at home on January 23, 2017. He was 92. Born in 1924 and married in Copenhagen, Denmark, his family moved to Chicago in 1953 and to Wappingers Falls in 1964.

He was an IBM engineer for 34 years and an avid ham radio operator with the callsign **WB2UWU**. A loving man, he is survived by his wife of 67 years, Lilli, daughter Heidi, son, granddaughters, grandson-in-law, and great grandson. In Finn's words: "My XYL Lilli is a lovely person who supports me in my ham radio and other interests."



Finn Poulsen, WB2UWU.

Finn was first licensed as **OZ7PO** in 1947 at age 23, but was only on the air a couple of times due to lack of antenna space. Instead, Finn was active attending ham radio club meetings and fox hunts. Marriage, emigration to the United States, and family put ham radio on the shelf for many years.

Finn eventually earned his WB2UWU ticket in 1978 and kept that call through upgrades to 20 wpm Extra. Finn was an active member of the Mount Beacon Amateur Radio Club, the QSY Society and the Straight Key Century Club (#1708).

Finn's work experience was vast and diverse. Finn served as an electrician, aircraft radio mechanic, computer field serviceman, and associate engineer in computer development and integrated circuit prototype testing. At IBM, Finn worked on a team developing the very first personal computers and peripherals. Quite a fascinating career!

Finn was a quiet and gentle soul. I first met him at Locust Grove, The Samuel F.B. Morse estate in Poughkeepsie during a special event radio station in April 2012. Finn participated in these events for years at Locust Grove and operated from the carriage house, in the downstairs kitchen and, in the last couple of years, on the porch. I introduced myself and told him how much I loved CW and especially operating with straight keys.

Finn's eyes lit up with welcome. We had a long talk about straight keys comparing our collections and experiences on the air. Finn was quite fond of a Japa-

nese straight key he once received from a friend. I told him all about a Navy spark-proof my Dad and uncle gave me as a kid. We were fast friends from that moment on. Finn always had a wonderful outlook on life and a mellow and genuine smile. A nicer man you would never meet.

Finn had a lot of fun on Mr. Morse's porch. A couple of

years running, Finn would bring a QRP rig to the special event station sessions. He had a homebrewed 50 ohm BNC terminator combined with a little steel whip that he would use as an antenna. As all the other club members were pounding away with their Elecrafts and other exceptional rigs making multiple contacts from the nearby picnic tables, Finn would jump in and work our stations from just a few feet away! 'Hey! Wait a minute! I know that call-sign!' Some great laughs followed!

Needless to say, I will miss his friendship and great conversations. If ever a man were consid-

ered 'a grand old ham' it would be Finn. He loved his family. He loved his life. He loved CW and Morse Code. I will always remember his warm handshake and his smiles. Better men don't exist. Our sincere condolences and prayers go out to everyone in the Poulsen family.

His daughter Heidi said there would be no services, at his and Lilli's request. The Poulsen family asks instead of flowers, people may contribute to the New Hackensack Reformed Church at 1580 Route 376, Wappingers Falls, N.Y. 12590 or to the New York State Trooper Foundation, State of NY Troop K, 3 Airport Park Boulevard, Latham, NY 12110. Cards may be sent to: The Poulsen Family, 93 Edge Hill Road, Wappingers Falls, NY 12590.

Thanks to Shirley Dahlgren N2SKP, The *Poughkeepsie Journal* and Finn's biography on QRZ.com for additional information.



This Morse key was given to Finn by a co-worker who acquired it while stationed in Japan after the end of World War II.



Finn operates /P on the porch at Locust Grove in 2013.

- 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 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 Feb 5:** PCARA Meeting. New York Presbyterian - Hudson Valley Hospital, 3:00 p.m.

**Wed Feb 15:** PCARA TRACCS Workshop, Mohegan Fire Dept, 1975 East Main St (Rt 6), Mohegan Lake. 7:00 p.m.

## Hamfests

**Sun Feb 26:** LIMARC Hamfest, Levittown Hall, 201 Levittown Parkway, Hicksville, NY. 9:00 a.m.

## VE Test Sessions

**Feb 4, 11, 18, 25:** Westchester ARC Radio Barn, 4 Ledgewood Pl, Armonk, NY. 12:00. Pre-reg M. Rapp, (914) 907-6482.

**Feb 7:** West Point Cadet ARC, Jefferson Library, 758 Cullum Rd, Rm JH401, West Point, NY. 6:30 p.m. Pre-reg Matthew G. Sherburne, (845) 938-5580.

**Feb 9:** WECA, Westchester Co Fire Trg Cen, 4 Dana Rd., Valhalla, NY. 7:00 p.m. S. Rothman, (914) 949-1463.

**Feb 12:** Yonkers ARC, Will Library, 1500 Central Ave, Yonkers, NY. 1:00 p.m. Pre-reg John Costa, WB2AUL, 914-969-6548.

**Feb 17:** Orange County ARC, Munger Cottage 183 Main Street, Cornwall NY. 6:00 PM. Joseph J. DeLorenzo (845) 534-3146.

**Feb 20:** Columbia Univ ARC, 531 Studebaker Bldg, 622 W 132nd St, New York. 6:30 pm, Alan Crosswell (212) 854-3754.



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