



PCARA Update



Volume 5, Issue 12

Peekskill / Cortlandt Amateur Radio Association Inc.

December 2004

It's your choice

Elections will be held at the December 5th meeting / Annual Holiday Dinner, which will be held at *At The Reef* Restaurant in Annsville (Route 9 and the Annsville Circle). Please come out and join us for our Annual Holiday Dinner. If you wish to join us, please let Ray, W2CH know by e-mailing him at w2ch 'at' arrl.net **as soon as you can**. The cost is only \$22.16 (drinks extra) per person. I'm sure we'll be able to squeeze a few more people in.

At this time of the year it's not unusual to reflect on what we have accomplished during the past year, but also to ponder on where we hope to go in the coming year. In 2004 we had two very enjoyable Foxhunts and a very successful Field Day, in which our score increased for the third year in a row. PCARA came in 2nd for class 2A in the ENY section. What lies ahead for 2005? The answer to that question lies with the membership. Bring your ideas and suggestions to the January 2005 meeting!

To each of you and your families, I wish a very happy and healthy Holiday Season, and a joyous and blessed new year! I hope to see each of you at the December meeting!

– 73 de Greg, KB2CQE

Holiday Dinner

PCARA's annual holiday dinner takes place at 3:00 p.m. on Sunday December 5 *At The Reef* Restau-



At The Reef restaurant, located on Annsville Circle in Cortlandt Manor, is the venue for PCARA's December meeting and annual Holiday Dinner.

rant. Ray W2CH and Marylyn KC2NKU have arranged the following menu choices:

MENU
<i>Tossed green salad</i>
Choice of entrées:
<i>Prime Ribs of Beef</i>
<i>Chicken Cordon Bleu</i>
<i>Boneless Breast of Chicken Marsala</i>
<i>Broiled Stuffed Filet of Sole</i>
<i>Broiled Filet of Salmon</i>
<i>All entrées include: Baked Potato, Vegetable, Coffee, Tea and Cake of the Day.</i>

Final total is \$22.16 per person, not including drinks. If you would like to attend the PCARA Holiday Dinner but did not sign up yet, please contact Ray, W2CH, e-mail: W2CH 'at' arrl.net.

Contents

It's your choice, KB2CQE	1
Holiday Dinner	1
Build an antenna to di for! N2KZ	2
PAC-12 antenna	5
A visit to ARRL, W2CH	6
Embarrassing moments, NM9J	7

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Build an antenna to di for! – N2KZ

Dipoles could be the most popular antenna in the world! This month, I'll share my construction hints to help you make your dipoles sturdy, durable and effective. They are easy to build and a breeze to toss into a tree. Operating with a homebrew dipole really adds to your ham radio fun!



Solid and stranded wire suitable for antennas is available from Home Depot.

Good antennas start with good materials. I have often heard that hard drawn solid wire works best, but I cannot say I agree. Wire hanging up in swaying trees needs to be flexible! My standard is #12 stranded white insulated electrician's wire available from Home Depot. I buy it in 500-foot rolls, and it is enough for many antenna elements. Every dipole requires three insulators. One is placed at each end and one in the center. I like the dogbone ceramic types for their long length and strength. Egg type insulators can be substituted,



Dogbone and egg-type antenna insulators

but you really need a dogbone in the center. I have used PVC pipe couplings, wood blocks and glass insulators. Ceramic dogbones are the best.

Coaxial cable, especially at HF frequencies, can be very forgiving. As a side benefit of my place of work, I am blessed with an endless supply of cable scraps. A dipole has a theoretical impedance of 75 ohms. I have used all sorts of coaxial

cable at 50 and 75 ohms, in RG-58 or RG-59 sizes, with excellent results. The amount of weight added by heavier RG-8 type cables may not be worth the addi-

tional reduction of line loss. Heavy cables demand a center support to eliminate droop. The added weight can create strong physical oscillations when wind speeds become severe. I like to keep my dipole designs as light as possible. It's easier on your support ropes and the tree's branches and limbs.

Speaking of rope, you also need good long lengths of medium width rope. If an antenna is up 40 feet, you need about 100 feet of rope at each end. Why? If you ever need to repair the antenna or replace a fraying rope, you need to lower it for service without losing its perch in your tree or off your tower. Additional length will save you from needless, time-consuming restringing. Please choose your rope carefully! It has to fit through the hole of the insulators.

Clear silicone seal, used in bathroom installations, is very effective to waterproof all your bare wire connections. I coat all my exposed joints and connections with silicone seal. Don't forget to coat the coax braid at the center! Seal all your connections as if they were going to be underwater. Years of rain, snow and powerful sunshine is not easy to survive! Only use clear silicone seal. Grey, black or white seal can be conductive and wreck your project.

Finally, two or three Ty-wraps work well to secure the coax cable around the center insulator. If you are a true artiste, you can tightly secure the coax connection with old-fashioned lacing.

Do the math! Get out your calculator! Decide your optimal center frequency of operation, and then use the 468 rule.

$$l = \frac{468}{f}$$

468 divided by your frequency in megahertz equals the complete length of the dipole from end to end. In example, 468 divided by 14.030 (my 20 meter CW center frequency) is 33.35 feet, or 33 feet 4¼ inches. Divide by two for the length of one element: 16 feet 8 inches.

Keep in mind that the antenna you create using the 468 rule may appear to resonate on a slightly lower frequency than designed when in actual use aloft. It is rare to mount a dipole with enough height, clearance



Clear silicone sealant provides a flexible, waterproof coating for the ends of cables.

and optimum ground conductivity to reach theoretical design parameters. Trimming a dipole to the perfect length of resonance is an art. It is much better to be a little too long than a little too short. You must hoist your antenna to its final height to accurately assess its resonance. The higher your antenna sits, the better it will work. Fear not: I have had reasonable results at ten feet off the ground!

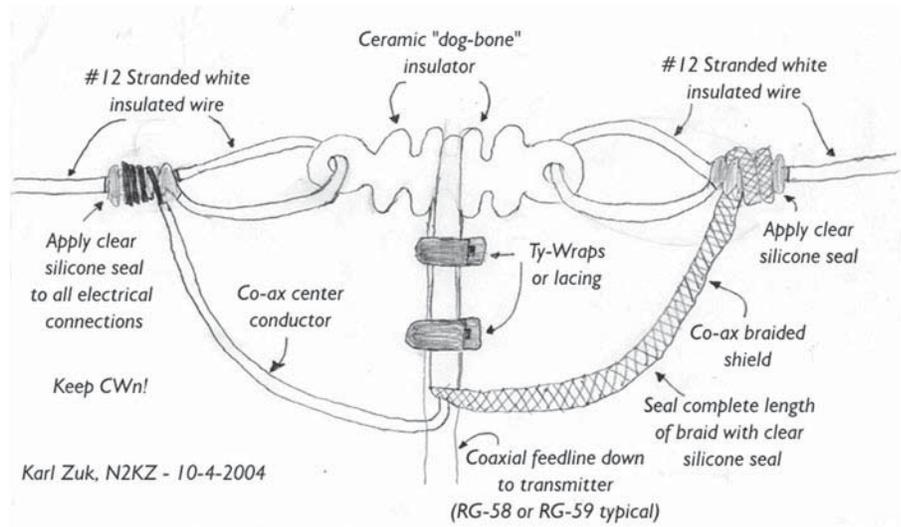
After you discover how long your antenna should be, take a walk outside. A good outdoor survey is essential for success. Look at your nearby trees, buildings, and telephone poles. Try to envision what could be used as end supports.

Longer lengths may require a center support, as well. My choice is frequently a nearby tree. Use anything that is convenient: A chimney, a pole, a hook or bracket secured to your house, or your 50 foot tower. Do you have room for the length you desire? Also, remember, generally, the higher up you can place the antenna, the better it will work. Always try to mount your antenna where it will be free and clear. Important: Preserve your safety and reduce interference! Stay far away from any power or utility lines.

Sometimes you need to rely on your creativity. I love the low bands and I had to find a way to keep my 80 meter dipole off my roof. I did not have a chimney or a tree nearby for a center support, so I cut a four foot length of three inch white PVC pipe and placed it over a breather pipe from one of my bathrooms. No physical attachment was necessary. I am depending completely on the weight of the antenna and gravity. I drilled a couple of holes in the top of the PVC pipe to pass a support rope through. This unconventional approach did the job! It's been in use now about five years without any trouble.

After you have found a good place to fly your antenna, it is time to start building. Look at my diagram and follow along. Begin by rolling out a few feet of #12 wire from your roll. Use a single edged razor blade and very carefully cut the end of your wire's insulation back from the end about three inches. If you use a traditional wire stripper you may damage or cut through the wire's strands. The end of your wire should now be bare. Loop the wire end through the dogbone and approximate where the wire end will meet the antenna element. Strip back a couple of inches of insulation at the meeting point and then wrap the wire to make a tight fit.

After you have constructed your first loop at one end, use a few feet of rope, through the remaining hole



How to connect cables to dipole center insulator. [Drawings by N2KZ.]

in the insulator, to secure the end for measurement. I like to tie down the far end to a post on my deck. Use anything that works for you. Roll out your wire next to a steel tape measure along a surface that is relatively flat. Remember to allow enough wire to create a loop through the center insulator. The total length of the element is from loop end to loop end.

After you secure the loop at the other end of your first element to the center dogbone insulator, it's time to make the second element. It's an identical copy of your first element. The second element needs to be precisely the same length as the element you have just completed. Repeat the process of building the first element and make sure the second element also loops through the center insulator. By this time, you should be an expert. Now you have the largest set of rabbit ears ever made! It's time to connect the coaxial cable.

Contrary to the beliefs of some PCARA members, I don't use baluns. Good engineering design requires a balun to insure proper transference of energy. A direct connection has not failed me yet! Eliminating the balun reduces weight and cost and increases reliability. There is less to go awry. Experiment and decide for yourself. Some hams can't live without baluns. I operate daily with homebrew dipoles with no baluns or external antenna tuners using as little as 250 milliwatts. Simplicity works for me!

Here is the trade-off: When you use a balun, a transformer that matches BALANCED dipole elements to an UNBALANCED coaxial feedline, all the energy from your transmitter should be radiated by the antenna's elements. If you don't use a balun, the coax feedline becomes part of the radiating element. The balun must be properly wound for best efficiency. A balun also adds weight and complexity to the design that can eventually loosen or come apart. Balun or no balun? Experiment and decide for yourself!

Prevent feeling like a dummy! If you are using a coax cable that already has connectors on it, make sure you feed the cable through your wall or window before you connect permanently to the center insulator of the dipole. You don't want to make a beautiful antenna and then have no way to get a large connector through a wall. This is similar to the PL-259 connector dilemma. Have you painstakingly made a beautiful, artful connection to a PL-259 and then realize you have not threaded the screw-on collar first? I know I have.

Take a look at my diagram of the connections at the center insulator. I use a single edged razor blade to delicately cut a few inches of insulation from the end of the coaxial cable. Then I gently open the braid at the insulations' end and pull the center conductor out from under the braid. Now, I have two wires, free and clear, to connect to the dipole elements. I loop the coax around the center insulator and secure it with a couple of Ty-Wraps™. Solder both connections by placing your iron under the connection and heating it enough so the solder will melt above the connection. It may take some time for the joint to get hot enough to melt the solder. Make sure the connection is thorough, clean and bright.

Hoist away, matey! Your antenna is essentially complete and it's time to try it out. Flying an antenna is an art all its own. It's a great way to meet your neighbors (HI, HI). People use sling shots, casting fishing line, throwing balls, rocks or logs to hang wire antennas.

I've used a series of connected poles and a half-filled plastic soda bottle. I combine the long pole from our swimming pool with some pipe sections we use for an outdoor tent. This combination creates a reach

of about 30 feet. I attach a half-filled soda bottle to the end of the pole with the rope tied to it. The rope end is held in place by a loose piece of tape. I carefully raise the pole up into the trees aiming for my target branch. When I shake the pole, the soda bottle comes loose and falls to the ground. I can precisely place ropes with this kooky method.

When your antenna is high and away, connect it to your rig and discover your point of resonance. You'll need a SWR bridge, wattmeter, or antenna analyzer to measure your forward and reflected power. Try test transmissions up and down the band to see where the least amount of reflected power is seen. Is your point of resonance at the center of your area of operation? For example, I work CW on 20 meters from 14.010 to 14.060. My center would be 14.035. This should be my point of resonance.

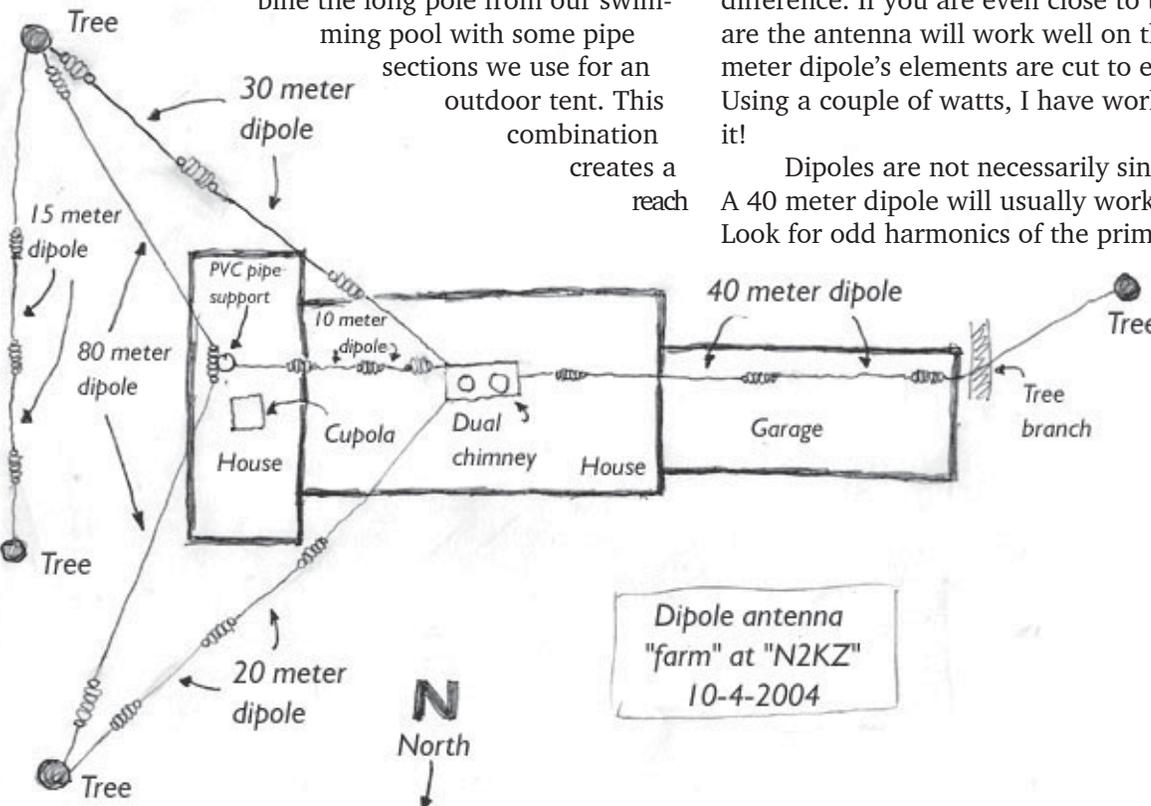
If you find that your point of resonance is too high in frequency, your antenna is too short. If you find your point of resonance is too low in frequency, then your antenna is too long. Measure your SWR over the frequency range you will be operating on. If it is less than 1.5 to 1, leave it alone. Otherwise, you'll have to rebuild the elements to a longer length. If it seems too long, you can trim your elements slightly to see if you can improve performance.

Again, use the 468 formula to try to gauge how far to trim.

Theoretically, 14.010 MHz would require elements 16 feet 8½ inches long. At 14.060 MHz, the elements should be 16 feet 7¾ inches long. It's less than an inch difference. If you are even close to this length, chances are the antenna will work well on the first try. My 20 meter dipole's elements are cut to exactly 16 feet even. Using a couple of watts, I have worked the world with it!

Dipoles are not necessarily single band antennas. A 40 meter dipole will usually work well on 15 meters. Look for odd harmonics of the primary band. Similarly,

an 80 meter dipole could suffice on 30 meters. Another school of thought suggests putting up a single dipole for your lowest band and then tuning it, with an external antenna tuner, to all the other bands above it. I have worked some stations on bands as high as ten



meters that have used “tuned in” 80 or 40 meter dipoles as antennas.

Your final step is to cover all the bare wire connections with silicone seal. I lower the antenna almost to ground level. This allows me to apply the silicone without getting grass and other dirt onto the antenna. Cover all the areas that are bare with ample amounts of seal. Any moisture that creeps in will eventually weaken the performance of the antenna. Use disposable rubber gloves. Silicone seal is irritating to the skin and a little hard to remove. Remember to solder the connections on the far end loops before you seal them with silicone.

Let the seal dry for at least a few hours, then hoist away and play. I have had terrific success with my dipole antenna farm.

I need to try more complicated designs! I need more trees!

Finally, if you build multiple dipoles, think about positioning them to aid each other’s performance. Take a look at the overhead diagram of my house and its antenna farm. I use an element of my 80 meter dipole as a reflector for my 20 meter and 30 meter dipoles. Does it create a two element beam? I like to think so! I have had fantastic results on 20 meter CW using a tiny QRP transmitter. It’s hard to believe that the 80 meter element does not help. Most of my contacts have been toward the west.

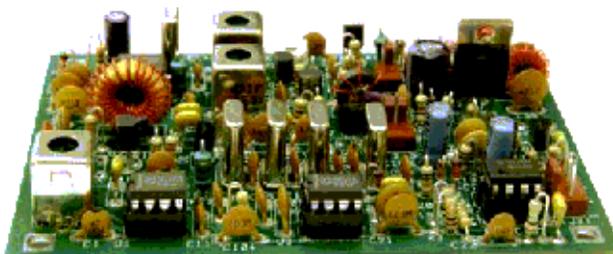
Dipoles are great fun. They are easy to make, easy to mount and use, and easy to move from place to place. Try one out and see for yourself! I’m waiting for your call on 30 meter CW!

Bits ‘N’ Pieces

The solar storm in early November wiped out the low bands and AM radio for over three weeks. Usual low band HF propagation came to a standstill. It was very hard to complete a QSO with anyone! Nightly displays of the Northern Lights created quite a show. Solar particles punished the D layer providing some very interesting conditions. AM radio was reduced to reception of very local stations only, for the most part. There were several openings of strong signals, all alone on many frequencies, from the Caribbean and Central and South America.

I was operating on 30 meter CW nightly, sending CQ endlessly to what sounded like a dead band. The occasional openings reminded me of Sporadic E on 6 meters. I would enjoy robust short-lived openings to places like Montana. Many QSOs would start quite strong and fade out or disappear completely in a flash. It was a wild chase of cat and mouse and a lot of fun! If you seek pleasant surprises, always send when a band seems dead!

The QRP fun continues to flourish at my QTH. My latest experiments have been with a Small Wonder Labs



SW+xx circuit board, available from Small Wonder Labs, <http://www.smallwonderlabs.com>

SW+80 for 80 meters. This tiny transceiver covers a small slice of the band from about 3530 to 3560 kHz with a mighty 2½ watts. The chassis is compact and light. It can easily be held in the palm of your hand. I power my SW+80 with 8 D cell batteries. I usually reply to CQs or tailgate QSOs that are ending. I have had great success with many QSOs turning into nice long rag chews. The SW+80 has a hot receiver and produces a sweet musical note on transmit.

A sign of the times: In the Detroit area, the road signs that used to prompt you to tune to AM 760 and 950 for traffic reports have been changed. The new ones now mention XM and Sirius satellite radio channels, as well.

Happy Thanksgiving and Merry Christmas to all the readers of *PCARA Update*!

- 73 de N2KZ Karl “The Old Goat”.



PAC-12 antenna



Mike, N2EAB shows his home-built PAC-12 antenna to Greg KB2CQE at the November meeting. The PAC-12 is a multiband portable vertical antenna that packs into a small space. Components can be found at Radio Shack and Home Depot. For further details see the American QRP Club at <http://www.amqrp.org>.

A visit to ARRL

Have you ever visited American Radio Relay League headquarters in Newington CT? If not, you've missed a treat. Ray W2CH and Marylyn paid two visits in late October, shortly after Marylyn received her new call of KC2NKU.

Ray and Marylyn's first visit on October 21, 2004, included a tour of ARRL Headquarters followed by some operating at the Hiram P. Maxim Memorial Station, W1AW.



ARRL Headquarters, located in Newington, Connecticut.

If you are thinking of visiting ARRL headquarters, here are some points to bear in mind. The site is located on Main Street in Newington, southwest of Hartford. You will know you are near when you see the impressive collection of tall towers. Members and the general public are welcome during office hours, 8:00 a.m. - 5:00 p.m. Monday through Friday. Tours of the Administrative Headquarters and the Maxim Memorial Station, W1AW, take place at 9, 10, and 11 a.m. and 1, 2, and 3 p.m.



ARRL Administrative Headquarters building.



Since 1938, ARRL HQ station W1AW has operated from this dedicated building, with some very impressive antennas.

Some of the things you can expect to see on a tour of Headquarters include the DXCC Department, administering Amateur Radio's premier operating award, the League's QSL Bureau, and the ARRL Lab, where testing of commercial amateur equipment for "Product Review" and ad acceptance takes place. The tour will include the League's Production Department, responsible for *QST* and other publications. Other departments such as



*Ray, W2CH operating from ARRL Headquarters station, W1AW, October 2004. [All photos by **W2CH/KC2NKU**]*

Field and Educational Services, Advertising, and Volunteer Examiner Coordinator will also be included.

The Hiram P. Maxim memorial station, **W1AW** is open to visitors from 8 a.m. until 4 p.m. Monday through Friday. Licensed amateurs may operate the station from 10 a.m. to 12 p.m. and 1 p.m. to 3:45 p.m. Remember to bring your current FCC amateur license or a photocopy. Ray and Marylyn spent their second Headquarters visit at W1AW, operating on HF.

Embarrassing moments

Here's a recent "Newsfront" item from *WorldRadio* magazine concerning the mystery signals on 40 meters, determined by the FCC to originate from somewhere north of Prescott, Arizona, and west of Interstate 17... (see <http://www.arrl.org/news/stories/2004/09/09/103>)

Stuff Happens

In the November issue, *Amateur Radio Newslines*TM reported "Strange signals at 7238 kHz." Before we go into this, we will say unequivocally that accidents do happen. That said, the story goes that an elderly ham was tuning a 40 meter antenna in his RV. He finished tuning and inadvertently left his rig keyed. It was also reported that after the faux pas was discovered some weeks later and he had partially recovered from the embarrassment, he stated that he would "never get on the air again" and gave away his equipment. Quite a punishment he leveled upon himself for a simple mistake. – tnx *WorldRadio*, December 2004.

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I have to agree with *WorldRadio*'s editorial opinion... most of us with access to transmitting equipment have made mistakes in the past that resulted in unintended transmissions... and radio amateurs, being a friendly bunch, will usually forgive a genuine mistake. It's only those intentional or malicious actions that will bring the wrath of Riley down upon you!

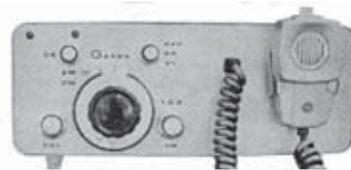
For example... in my early days of amateur radio, I had a set of home-brew AM transmitters for the VHF/UHF bands. These transmitters were fed from a common power supply and A.M. modulator with its own press-to-talk microphone. The power supply also had a large toggle switch on the front panel that could be used for extended transmissions. One day a heavy item from my top equipment shelf fell down and knocked the toggle switch into the "Transmit" position. Unfortunately, I didn't notice this event for half an hour. As I finally switched the transmitter off, the receiver came back to life and I heard a few stations asking "who was that"? After a few minutes, I decided to own up!

Here's another awkward moment from the past. I used to own an Icom IC-22A mobile transceiver with a modified fist microphone. I had fitted a small switch to the mic. case to allow hands-free mobile operation with the microphone



Icom IC-22A 22-channel crystal-controlled 2 meter FM transceiver.

clipped to my jacket. Once again the inevitable happened and the transmit switch was accidentally flipped on – while I was driving along and listening to the car radio. A couple of friends heard what was going on, recognized the source and decided to override my transmissions until I reached my destination. Thanks guys!

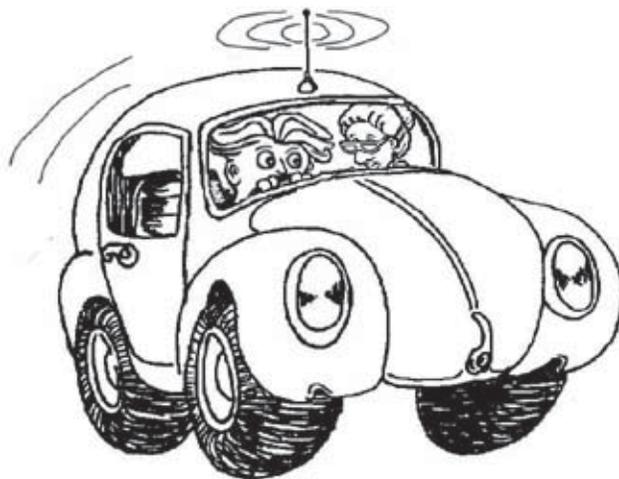


Garex Twomobile transceiver

Another friend in the U.K. recalls a similar experience when he had the opportunity to monitor his own station. My friend's mobile installation included a Garex Twomobile transceiver based on a Pye "Cambridge" radiotelephone, whose microphone had a press-to-talk switch sticking out of the top. One day his wife had taken the car and was returning from the shops with a companion. The shopping bag had been placed between the front seats... right on top of the microphone!



Pye radiotelephone microphone with press-to-talk button on top.



As a result, the day's gossip was broadcast all around town on 2 meters – for the entire drive home.

Fortunately, today's transceivers have sufficient intelligence to limit transmission length. Take a look in your radio's manual for details of the "Time out timer" or "TOT". This item may be accessible from the "Initial set mode" (Icom) or through an extended function key or menu setting (Yaesu). Some small transceivers such as the Kenwood TH-F6A have a compulsory time-out timer to protect the power amplifier from overheating. In the event of an unintended transmission, your embarrassment will only last as long as the setting of your time-out timer.

— Malcolm, NM9J

Peekskill / Cortlandt Amateur Radio Association

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Newsletter contributions are always very welcome!

Archive: <http://home.computer.net/~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 the Hudson Valley Hospital Center*, Route 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. (* except December.)

PCARA Repeaters

W2NYW: 146.67 MHz -0.6, PL 156.7Hz

KB2CQE: 449.925MHz -5.0, PL 179.9Hz

(IRLP node: **4214**)

N2CBH: 448.725MHz -5.0, PL 107.2Hz

PCARA Calendar

Sun Dec 5: PCARA holiday meal, elections, 3:00 p.m.
At *The Reef* restaurant.

Hamfests

Sun Jan 9 2005: Ham Radio University and ARRL NYC/LI Section Convention, Briarcliffe College, 1055 Stewart Ave., Bethpage, NY. 8:00 a.m.

VE Test Sessions

Dec 5: Yonkers ARC, Yonkers Police Dept., 1st Precinct, E Grassy Sprain Rd, 8:30 A.M. Contact: D. Calabrese, (914) 667-0587.

Dec 9: WECA, Fire Training Center, 2 Dana Rd., off Rt 9A, Valhalla NY 10595. 7:00 p.m. Preregister with Stanley Rothman, (914)949-6838.

Dec 13: Split Rock ARA, Hopatcong High School, Rm C-1, Hopatcong NJ. 7:00 p.m. Contact Sid Markowitz, 973 724-2378.

Dec 20: Columbia Univ ARC, Watson Labs, 612 W 115th St. New York, NY, 6:30 p.m. Contact Alan Crosswell, 212 854-3754.



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