



# PCARA Update



Volume 8, Issue 12

Peekskill / Cortlandt Amateur Radio Association Inc.

December 2007

## Buy dinner, bring anchor

The PCARA Annual Holiday Dinner is being held at *At the Reef* on Annsville Circle, December 2, 2007 at 3:00 PM. If you have decided that you would like to attend, just make sure you email Ray, W2CH **ASAP** at w2ch at arrl.net, and let him know you are coming. The cost is \$25 up front with drinks extra.



On December 2, pull alongside and drop anchor "At The Reef" located on Annsville Circle, just off Peekskill Bay.

For the Foxhunt on November 10<sup>th</sup>, the Fox (Sharon, KC2LLC) stymied the hounds. I hear that Malcolm, NM9J came close but no cigar. There are plenty of details in this edition of the PCARA Update.

We're going to try something new at the January meeting. A "Bring and Buy Auction" will be held at the January 6<sup>th</sup> meeting at Hudson Valley Hospital Center. Just bring the best of your boat anchors, shrapnel, and doorstops and be prepared to unload...uh...auction them off to others in the club. It's a great way of recycling gear to other members, and you just might find something you may like for yourself. Contact Malcolm, NM9J for further details.

To each of you, your families, and loved ones, I wish a very Happy and Healthy Holiday Season, and a most Joyous and Blessed New Year!

- 73 de Greg, KB2CQE

## New net night

Peekskill/Cortlandt Amateur Radio Association holds a weekly net on the 146.67 MHz W2NYW repeater. Please note that our net control Karl, N2KZ has changed net night from Wednesdays to **Thursdays** at 8:00 p.m.

## PCARA Officers

President:

Greg Appleyard, KB2CQE, kb2cqe at arrl.net

Vice President:

Joe Calabrese, WA2MCR; wa2mcr at arrl.net

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Antennas at the ready, Karl N2KZ and daughters Sarah and Laura prepare for the Nov 10 foxhunt, while Ray W2CH and Marylyn KC2NKU look on. Karl's account begins on page 2.

# Adventures in DXing

- N2KZ

## Hunt and Go Seek!

The fox got away! What a smart fox it was! Saturday, November 10, was a perfect day, crisp and cool with puffy clouds passing by in the sky. The PCARA hounds convened just after 2:30 PM in the Beach Shopping Center parking lot in Peekskill. All the usual suspects were in attendance: Malcolm, NM9J, Ray, W2CH, Marylyn KC2NKU and I. My two daughters came along for the adventure! Our Yagis were packed and we were ready to go!

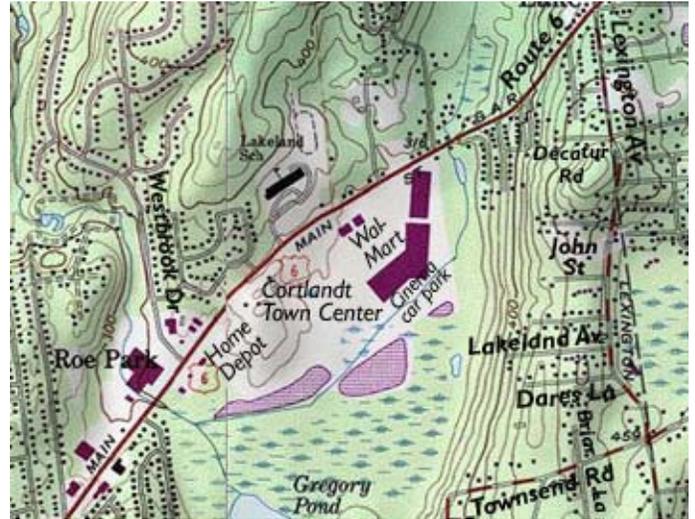
The fox was ready, as well. "Wires" KC2FYY, was the first place winner in our last hunt and had earned the honor of becoming the next fox. "Wires" was away at college, so his Mom, Sharon, KC2LLC, gladly came to the rescue and filled in as the fox. An excellent fox she was! The fox arrived early, with her first broadcast heard about five minutes before the official 3 pm start time. We all had a strong bearing to the east - north-east. Off we went!

The broadcast format was a little different this time around. The fox was on for one minute and then off for two. No human voice was to be heard, only a brief Morse code message mentioning the PCARA fox hunt ending in a steady tone. This created a new scenario for the hounds. There was little time to move from place to place. We approached it from a different angle: The fox was never long to be on the air, so we went where our bearings told us, waited for the next signal, took a quick bearing and went off again.

Our first stop was in front of Home Depot along Route 6. This time the signals were very strong and due east. We packed up our two Yagis into our minivan and took the plunge: traffic on Route 6 eastbound was at a standstill! After what felt like an eternity, we made a right on Lexington Avenue and headed due south. Our best guess was the Crompond Elementary School. We didn't want to go as far as Route 202, Crompond Road, so we made a right onto Townshend Street and stopped at the first cross-street called Briar Lane.

Now our bearing was north-northwest. Oh, we were confused! The fox must be back at the shopping center, maybe behind Wal-Mart. In retrospect, looking at our map more carefully, our bearing actually pointed toward the actual site of the fox transmitter! We rushed back into the minivan and headed back up Lexington Avenue heading, this time, north.

Dreading more traffic, we stopped at Decatur Road and took another bearing. It was just south of due west. The fox must be in the shopping center! It took us at least four turns of the stop light, but we finally made it through to Route 6 and made a left heading west



*Topographic map showing the area between Cortland Town Center and the high ground at Lexington Ave.*

again. Back to the shopping center!

We were immobilized by the heavy traffic everywhere. Parking quickly in front of Pier 1, we jumped out on foot and ran through the parking lot seeking the fox's third harmonic. They had to be close! Maybe not! Running back to the minivan, we scoured the nearby parking lots for almost half an hour. No fox! In the process, we passed Ray and Marylyn, and Malcolm, all looking diligently for the missing fox. We were getting pretty tired! No results!

It was getting late and the sun was disappearing into the west. What to do? I succumbed into being lazy. With the burden of sitting in Route 6 traffic again an unappealing option, we continued to roam in vain. Frustrated, at 4:30 pm, I jumped onto the fox frequency, 146.565 simplex, and called to the others: "Anyone find the fox? Anyone know what restaurant we are meeting at?" Malcolm first answered, then Marylyn and Ray. No fox. No luck. No restaurant location. We decided to meet at Applebee's restaurant in the shopping center. I arrived with the girls first. Ray and Marylyn showed up shortly thereafter. Malcolm called and said he was stuck on Route 6 (sounds familiar!) Ray and Marylyn, and the three of us (Karl, Laura and Sarah,) found a table at Applebee's and waited for Malcolm. Malcolm arrived a few minutes later and we shared our maps and frustrations!

Congratulations to the fox who survived the hunt! About 20 minutes later, Wires' Mom, Sharon, showed up at the restaurant wondering why we didn't look harder for the fox! She chose the very end of Lakeland Avenue, off Lexington Avenue, as the fox's den. This sly fox also was using a directional Yagi antenna and a pair of Motorola transceivers that produced a ton of RF power. (The power was later revealed to be about five watts.) This combination gave us quite a challenge!

This was not the first time I have gotten caught

along Lexington Avenue during a foxhunt. This thoroughway exhibits odd patterns of attenuation and signal reflection. I remember chasing my tail back and forth through this region once before, getting caught by misinterpreted low signal readings. My resolution: Believe in your bearings and continue to triangulate. Your fox may be using varying power or a directional antenna. May the hounds beware!

Two important lessons were learned during this hunt: Depend on bearings and forget about relative power! If I had taken more accurate readings, and followed my bearings only, I may have found the fox! Sharon's Yagi, and the varied terrain up and down Lexington Avenue, stumped our pursuits quite well. Also, you can never have enough attenuation for your antenna. The potent power leaving her Motorola gear



*The hunters gather at Applebees, L to R Karl N2KZ, with daughters Laura and Sarah, plus Marylyn KC2NKH and Ray W2CH.*

was quite deceptive. You could be quite far away from the actual site and still think you were right on top of the fox! Well, maybe not!

Sharon mentioned that Malcolm's was the only car to come down Lakeland Avenue and suggested that he won the hunt. None of us disputed this, but we all felt a little disappointed. Right before we were served dinner, we ran out to the parking lot to see Sharon's Motorola gear and her tape-measure Yagi. It was very professionally assembled and made a quite competent fox! The fox lived to see another day!

Next Spring, the PCARA will hold another fox hunt. Who will be the fox? My resolution: Bring my most accurate compass and a better map - and - don't let relative power fool you. It may be beamed completely in another direction. Hearty congratulations to Will and Sharon for hosting a great hunt - and - thanks to Malcolm for serving as check-in coordinator at the Beach Shopping Center starting point. A grand time was had by all. Watch for a listing for the next hunt in PCARA Update and make sure you join us the next time around. The hounds must find the fox! Tally ho!

## Pacific Heritage

If you have ever wondered about the world of radio broadcasting in the Pacific, visit The Radio Heritage Foundation on-line. Based in Wellington, New Zealand, this site covers decades of radio history from Australia, New Zealand and all the islands of Oceania with fascinating depth. Every link provides another intriguing story of the personalities and station facilities that entertain this part of the world. You'll be amazed reading all the folklore and tales of days gone by from stations far, far away. They also feature a nice on-line shop offering a novel selection of books and other items. If you seek new adventure in web surfing, steer this way! Look for it at: <http://www.radioheritage.net>.



**RADIO HERITAGE  
FOUNDATION**

[www.radioheritage.net](http://www.radioheritage.net)

## Keep My TV!

There are only about 445 days left to watch over-the-air analog television. RCA wants to save you and your set from obsolescence! KeepmyTV.com is an informative all-in-one site explaining the coming transition to all-digital TV broadcasting. Of course, its main purpose is to promote RCA's low-cost DTA800 DTV to analog converter box. This device comes with a little plastic stand to hold it upright (if you wish) and a large-buttoned universal programmable remote. RCA and LG Electronics are the only manufacturers who have had converter boxes approved for sale after the first of the year as a part of the U.S. Government's subsidized voucher program. Starting January 1, you can apply for up to two \$40 coupons to offset the cost of digital to analog converters for your old analog TV sets. More information about the governmental voucher program can be found at: <http://www.ntia.doc.gov/dtvcoupon/index.html>.



*RCA DTA800 DTV converter*

I hope that these new mini-converters have better sensitivity and decoding capabilities than other versions seen in the past. I currently own a generation 2 and generation 3 converter. My most up-to-date converter, made by

Accurian (Radio Shack,) pulls in just a couple of DTV signals using the same pair of rabbit ears I use on a secondary set in one of my bedrooms. In comparison, over-the-air analog provides over a dozen stations easily and clearly. One can only hope that the new generation of converters, along with possible improvements in power or location of local DTV transmitters, will make DTV broadcasting a workable system before February 17, 2009! So far, I'm leery that DTV will receive a passing grade. Even with serious outdoor antennas and receivers, my reception of local digital television has been quite tentative.

### New Year's Delight

Please don't forget the finest (ham radio) holiday of all: Straight Key Night. From 7 pm New Year's Eve until 7 pm New Year's Day, the world dusts off its vintage equipment and manual straight keys and sends code the old fashioned way. Even if you do not know the code, have a listen! The variety of straight key fists is musical and fascinating to hear. Of course, it would be wonderful if you would join in! This is the one CW event all year that expects operators to send slow code! You are cordially invited! You'll find details at: <http://www.arrl.org/contests/rules/2007/skn.html>

Three weeks later, on January 20th into the 22nd, the ARRL's VHF Sweepstakes lets loose. Operate in any mode above 50 MHz early and often! See <http://www.arrl.org/contests/rules/2007/jan-vhf-ss.html> for complete contest information. And don't forget the winter solstice enhancement usually experienced on six meters during mid-December. Begin on 50.098 MHz CW or 50.125 MHz USB. Your adventures in DXing may have just begun! Have a wonderful holiday season, and see you on six (meters, that is!)

73 de N2KZ "The Old Goat"  
dit dit.



## Where was the fox? - NM9J

PCARA's latest fox hunt took place on Saturday November 10. The weather had become cool and snow had been falling overnight, but the sun was shining on the Beach Shopping Center car park as hunters arrived. Three teams signed in — Karl N2KZ, accompanied by daughters Sarah and Laura; Ray W2CH with Marylyn KC2NKU, and finally your editor NM9J bringing up the rear.

Following Wires' success in the previous fox hunt, the fox this time should have been KC2FYF. But Wires was busy studying upstate, so all we knew was that his mother Sharon KC2LLC would be the substitute fox, and the transmitter might be a CW beacon programmed

by Wires, keyed for 1 minute on, then 2 minutes off.

The first transmission on 145.565 MHz took place before 3:00 p.m., and confirmed that a CW beacon would be in use. The morse-code identification gave the callsign, announced that the PCARA foxhunt was taking place then gave a steady tone. This first transmission actually ended before 3:00 p.m., so to fit in with the rules, the hunters decided to wait until the end of the *second* transmission before leaving the car park. Directional antennas indicated a strong signal with a bearing of east-northeast.

It was immediately clear that the rhythm of this foxhunt would be quite different from past events. The next transmission had already begun while your editor was still in traffic on Route 6 alongside the Beach Shopping Center. There was just no time to park and pull out the directional antenna.

Our foxhunt rules are based on a format previously used by Bury Radio Club in England. The ten-minute cycle with a transmission timing of 3 minutes on followed by 7 minutes off was designed to give hunters sufficient time to get a good bearing at each stopping point, followed by enough time to drive on, find a parking spot and prepare for the next transmission.

With the pattern adopted by Wires, it was inevitable that some transmissions would take place while hunters were still moving *en route*. Mobile direction finding equipment would have been helpful — but Ray W2CH had returned his Doppler DF installation and everyone was using large, Yagi-style antennas. The short transmissions did not give much time for lengthy adjustments, such as inserting in-line attenuators or changing from a 146 MHz antenna to a 440 MHz antenna.

It did not take long for hunters to reach Cortlandt Town Center. From the area around Home Depot, signals were getting much stronger, with a bearing of due east. This suggested the car park behind Wal-Mart and the Cortlandt Stadium Cinema.

Ray W2CH and Marylyn KC2NKU had come to the same conclusion and arrived with me in the cinema car park. There was an immediate flashback to a previous foxhunt where Karl, N2KZ had hidden away behind the United Artists Cineplex inside his wife's minivan (see *PCARA Update*, October 2003). I spent some time checking the area, seeking out unusual antennas or



occupied vehicles in the parking lot, where cinema patrons had left many vehicles parked. Signals were very strong — I had 52dB of attenuation in the antenna lead and still received a full-scale signal. Just in case I was being misled, I checked all around the Wal-Mart building, running into Karl and his daughters on the busy north side — Karl was equally perplexed. My final conclusion from the cinema car park was that strongest signals were arriving at the southern edge, with a bearing of southeast. That direction led through the woods, across a pond and up toward the high ground (500 feet) around Lexington Avenue.

Rather late in the game, I struggled through the heavy traffic on Route 6 and began investigating all the narrow streets that lie on the west side of Lexington Avenue. There was no sign of any vehicle with an unusual antenna or even a suitable parking spot. The last street I checked out — Dares Lane — had an appropriate name (*Who dares wins?*) but it soon deteriorated into a pot-holed dirt track. Not very encouraging, though signals were still *very* strong.

By 4:30 p.m., there had been no announcement that the hunt was over, so a puzzled N2KZ broke radio silence to ask whether anyone else had tracked down the cunning critter. Neither W2CH nor NM9J had found the furry fox, or even detected its third harmonic on 440 MHz, so we decided to meet up at Applebees Restaurant, back at Cortlandt Town Center. As we exchanged our tales of baffled bearings, Sharon KC2LLC burst into the restaurant clad in cold weather gear and provided an explanation.

Our lady fox had been hidden away from her vehicle in the bushes with a tape-measure Yagi and battery-powered transmitter designed by Wires. The actual location was on Lakeland Avenue, which runs



*Sharon KC2LLC demonstrates the fox transmitting equipment and operating stance.*

west from Lexington Avenue and overlooks the Cortlandt Town Center, a mere 1000 feet away. Sharon reported that indeed, nobody had found her, though one vehicle — a silver SUV with a black spare tire on the tailgate — had been spotted driving up and down her street.

So the winner on this occasion was the fox! But since your editor came closest to finding the cunning carnivore, he was granted nominal first place, awarded a certificate designed by Wires and given the first prize of delicious home-made brownies made by Sharon. These were shared with the other, appreciative hunters after a satisfying meal at Applebees.

Thanks to Sharon KC2LLC for providing a worthy fall challenge and to Wires KC2FYY for organizing the fox's radio equipment. See you next year for the Spring foxhunt!

- Malcolm, NM9J

## **A Fox on fire! – Wires, KC2FYY**

Saturday, November 10<sup>th</sup> provided another opportunity for hunters to find the hidden transmitter. It's been a long time since PCARA started fox hunting games and finally, I won my turn to do some hiding. Over the years I had been reading all the material I



*Wires, KC2FYY practices his skills during a previous foxhunt.*

could get my hands on relating to direction finding. I figured this time I was going to throw the club a curve ball with my bag of tricks. Officially no one found the fox, but Malcolm NM9J, drove by my contraption a few times and was deemed the winner.

I was unable to be home that weekend from college, but that wasn't a problem. My mother was willing to spend a few hours supervising the contraption, and to provide the hunter with a certificate. The contraption was derived from past experiences of wanting to practice direction finding on my own — to sharpen up my skills without waiting for the next hunt. I needed an automatic beacon that someone could stash around town for me to hunt and chose the "ID-O-Matic"

beacon kit from NOXAS. (See <http://www.hamgadgets.com>.)

The ID-O-Matic is a nifty device that can be configured to control repeaters, hidden transmitters or anything else you want to have a timed message or ID transmitted from. It is computer programmable using HyperTerminal and a connection to your PC's COM port.

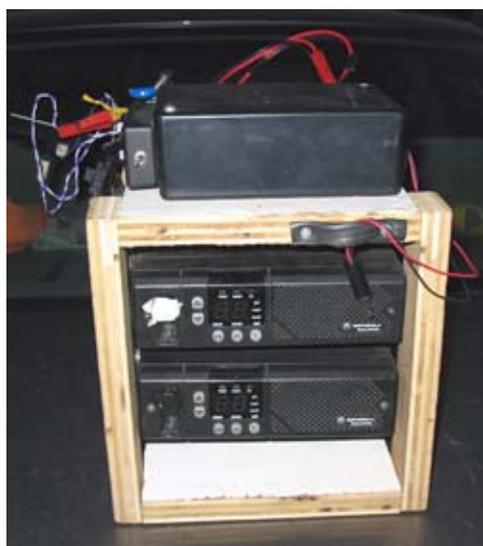


*ID-O-Matic CW beacon*

NOXAS' programming instructions are not very user friendly. Although he tells you what to do, you have to play around with different options to make the ID-O-Matic perform in the configuration you want. It does take some time, but this is the experimentation side of Ham Radio, and once you get it, you know it.

(Or write it down for future use.)

The next requirement was a rig that could pump out some power, and that could be hooked up quickly. The Motorola GM300 or Maxtrac provides a 16 pin accessory connector on the back for easy connection to COR/



*Wires' fox transmitting equipment, showing the Motorola Radius GM300 transceivers.*

COS, PTT, MIC, DISC audio, speaker audio and additional stuff. My experience with these rigs was acquired through creation of the Echolink Node Station which I currently operate and maintain.

The GM300 for this hunt was operating from a deep cell lead-acid marine battery, with 5 watts output. The rig was configured with a fan to dissipate as much heat as possible during transmit. I did some experimenting with the transmitter's on/off time — I figured that one minute on, two minutes off would provide the hunters with a sufficiently frequent signal. Although the duty cycle isn't typical for hunting a jammer, I figured two things — this was a practice, to allow time for the hunters to do their thing, and if we were hunting a

jammer we would all be collaborating. The antenna consisted of my tape measure fox hunting beam in a vertical polarization position.

A special thanks to mother for supervising the fox contraption and congratulations to Malcolm NM9J for winning the 2007 Fall Fox Hunt.

The bag of tricks is still building, until next time have a Happy Thanksgiving.

- 73 de Wires, KC2FYY

## Essential<sub>2</sub> sticky

Here's another episode in the occasional series where we look at chemical products that are indispensable to the radio amateur. The American Chemistry Council's "Essential<sub>2</sub>" campaign aims to explain how the chemistry industry is "essential<sub>2</sub>" our lives. In the latest phase of this campaign, two new TV advertisements were launched at the end of October 2007 to increase awareness of chemistry's contributions. See <http://www.essential2.com>.

Most shacks have a collection of sticky tape in the toolbox. Adhesive tapes are employed in all kinds of applications, from electrical insulation to watertight sealing, to holding components in place. Making sure those tapes stick correctly requires some crafty chemistry as this little history will show.

### Removing the mask

The story of modern adhesive tape goes back to 1921 when 3M lab assistant Richard Drew was taking early "Wet or Dry" sandpaper samples to an autobody shop in St. Paul, MN. There he observed the problems associated with the two-tone car finishes of the time. Masking-off of areas at the border of the two colors was carried out with plaster tape or newspaper and home-made glue. Removing the mask after the paint had dried left residues or caused the fresh paint to peel off. Richard Drew thought he could improve this process.

After two years' work experimenting with gentler adhesives based on linseed oil, resins, chicle and glycerine, Richard Drew came up with a pressure-sensitive formulation, which he coated onto a 2 inch wide strip of crepe paper. The adhesive only covered the edges of the tape, and when it fell off the vehicle during its first test, the angry body shop painter said to Drew, "Take this



*3M Masking Tape*



*Scotch Masking Tape*

tape back to those Scotch bosses of yours and tell them to put more adhesive on it!" By "Scotch" the painter meant "mean and stingy", rather than any drink or any person originating from GM-land. But the "Scotch" name stuck and "3M Masking Tape" went on to become "Scotch<sup>®</sup> Masking Tape". (By the way, the

company I work for manufactures car paint for body shops and runs training courses for those angry painters. I've paid a visit to their spray-painting school in Georgia.)

### The clear winner

Richard Drew's next invention made the 3M company famous. An insulation firm was looking for a way to seal insulation batts for use in refrigerated railroad cars, so Drew tried coating Cellophane (regenerated cellulose film) with adhesive for use as a sealant to keep the damp out. He applied a nearly invisible adhesive layer made from rubber, oils and resins, to a coated cellophane backing. The insulating application did not take off, but Drew was next called on to find a way of sealing Du Pont Cellophane, which was becoming popular with food distributors as moisture-proof packaging. Drew and his colleagues spent more than a year developing his cellophane tape further, but there were problems. The cellulose tape backing curled near heat, split when it was machine-coated and did not accept adhesive evenly. The production problems were solved one by one, and the team designed new coating machinery that applied a primer coat to the film backing, so the adhesive could be evenly spread. They also developed a new, almost clear adhesive.



*3M tape wizard  
Richard Drew.*

Because the new product was waterproof and withstood high temperatures, the tape soon found other uses. Introduced in 1930, at the start of the Great Depression, Scotch® Brand Cellophane Tape was used by thrifty people for sealing packages, mending torn pages in books and documents, repairing bank notes, fixing ceiling plaster and preserving cracked turkey eggs. 3M celebrated the 75<sup>th</sup> anniversary of Scotch transparent tape in 2005. (<http://www.3m.com/brands/scotch/anniversary/index.html>)



In the UK, transparent tape is better known as "Sellotape", a brand that originated in 1937 when Colin Kininmonth and George Gray coated Cellophane film with a natural rubber resin.

Shortages of rubber during World War II led 3M away from rubber-based adhesives for their tapes toward synthetic acrylate adhesives, which do not yellow over time, and maintain better clarity. Acrylic pressure sensitive adhesives are made with several types of acrylic monomers that are polymerized to high molecular weight polymers. The two main acrylates used in modern pressure sensitive adhesives are 2-ethylhexyl acrylate and iso-octyl acrylate. Their adhesive properties can be modified by compounding with tackifiers, such as terpene resins and other resinous components to improve adhesion.

Further improvements to 3M's tape were made by changing the tape backing from cellophane to cellulose

acetate film, avoiding the crinkling and yellowing that cellophane suffers as it ages. The starting material for cellulose acetate film is wood pulp or cotton seeds, which are broken down into cellulose fibers with mechanical crushing and chemicals such as soda. The raw cellulose fibers are then treated with acetic acid and acetic anhydride to create "triacetate", followed by partial hydrolysis to produce the basic form of cellulose acetate. After removing moisture, the cellulose acetate is mixed with a plasticizing material, and the resulting cellulose acetate plastic is pelletized. The pellets are melted and spread over a conveyor belt to form thin plastic sheets. The resulting film is then wound onto rolls thousands of yards long to await application of the adhesive.

Today's acetate-based Scotch Magic™ Tape disappears when applied to paper, stays invisible and can be written on. The adhesive remains on the backing and does not soak into the paper, as with earlier tapes.



*Scotch Magic Tape.*

### Sixty years of sticky

Until 1947, the only tape available to electricians was what we now call "friction tape". This was a cotton fabric tape impregnated with tar, using a vulcanized rubber adhesive. I can remember having to use this horrible black-colored tape as a youngster – it was messy, lacked strength and it tended to rot or dry out over time. It had to be applied over rubber tape to insulate a conductor, and under certain conditions, the rubber adhesive – vulcanized with sulfur – caused corrosion of the copper.

By 1946, with the baby boom underway, novel polymeric materials from World War II were becoming available, including **polyvinyl chloride**. Early efforts to combine this vinyl polymer with an adhesive to make electrical tape were not successful but 3M persisted and in January 1946, three 3M scientists applied for a patent for a vinyl electrical tape with a plasticizer system and non sulfur-based rubber adhesive. Their choice of polyvinyl chloride was a good one because plasticized PVC is highly flexible, it can be stretched, and it is a good electrical insulator. (Nowadays, most electrical wire in homes and shacks is insulated with PVC for similar reasons.) Esther Eastwood was the 3M team member who found a plasticizer that would stay in the PVC backing and not migrate into the tape's adhesive coat.

3M is currently looking back to the 1940s to recall the company's invention of vinyl electrical tape. Scotch electrical tape is now 60 years old and is the only vinyl electrical tape still made in the United States. The tape that has since become known as Scotch® Super 33+™ Vinyl Electrical Tape is the 17th version of this best-selling vinyl tape. Increased adhesion allows the tape to remain sticky, adhere smoothly in low temperatures and not ooze or melt in high temperatures. The improved backing provides greater flexibility in cold weather and easier

handling year-round. (See: <http://www.omnexus4adhesives.com/services/news.aspx?id=737>)

The first commercially-available vinyl tape was actually yellow. Later versions were white, but that color proved unstable in ultraviolet light. The popular black version was introduced because electricians were already familiar with black tape, and it would withstand ultraviolet radiation better. Nowadays you can purchase vinyl tape in a variety of bright colors, equally suitable for color-coding electrical cables, marking tent poles or identifying aluminum antenna elements.

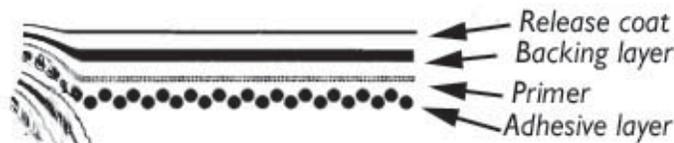


Scotch Super 33+ vinyl electrical tape

To use vinyl electrical tape reliably, it should be stretched and applied tightly around the joint without leaving gaps between tape wraps. Don't stretch the last wrap of the tape so it won't peel up or flag.

### Attractive layers

Modern pressure-sensitive adhesive tapes actually have four layers. We'll start with the backing layer, which might be made from crepe paper, polyethylene or polypropylene film, cloth, metal foil or plasticized PVC. A release-



Modern adhesive tape consists of four layers.

coat is applied to the backing layer on the side opposite the adhesive, to allow the next layer of tape to unwind from the roll without sticking. This release coating is often a polyvinyl carbamate. The other side of the backing layer has a primer or keying coat applied to insure good adhesion to the fourth layer, which is the actual adhesive. Formulation of the adhesive layer requires a combination of ingredients to obtain the correct combination of pressure-sensitive stickiness, removability, clarity and waterproof characteristics.

### Two-sided sticky

A different type of 3M tape originated from the work of Ted Buchholtz, who had been recruited into 3M's somewhat eccentric "ProFab" lab. Buchholtz began experimenting with ways to make urethane foam, adding colors and exploring ways the foam might be used. His first 3M patent was the chair rail, which used foam to protect walls from chairs bumping into them. Continuing to explore ways to use the foam, Buchholtz put adhesive on both sides of it and called it double-coated foam tape.

This discovery was the forerunner to 3M's Scotch Mounting Tape, which can be used in the radio shack for keeping electronic components in place against a chassis or circuit board, for fastening microphone clips to a shelf or dashboard as well as for its intended purpose of mounting signs, maps and even QSL cards on the wall, without screws or nails.



Scotch Mounting Tape

### All wrapped up in itself

Another type of tape that deviates from the usual formula is "self-amalgamating" tape. This product binds to itself when wrapped around an electrical joint, forming a uniform, waterproof protection over odd-shaped components such as coaxial connectors, ground rod ends and other items useful to radio amateurs. Some tapes such as Scotch 2228

Rubber Mastic Tape are wound with a paper liner layer to prevent the compound fusing with itself before it has been



Scotch 2228 Rubber Mastic Tape

removed from the roll. Scotch 2228 tape consists of an Ethylene Propylene Rubber (EPR) backing, coated with a strong, temperature-stable mastic adhesive. Other types such as Scotch 130C Linerless Rubber Splicing Tape forsake the paper liner, by having a tacky side and a non-tacky side to the EPR base. In use, these tapes are applied with the tacky side up, stretched to a minimum of three quarters of their original width and half-lapped to produce a uniform build-up around the joint or assembly. The joint should then be further protected by wrapping it with two half-lapped layers of vinyl electrical tape.

So, next time you fish some adhesive tape out of your toolbox, think of all the chemistry — and the clever chemists — that contributed to its manufacture and its ease of use.

- NM9J

## New chips for old

On November 11 2007, Intel Corporation unveiled sixteen new processors for servers and high-end PCs. As explained in the *PCARA Update* for February 2007, these processors make use of new materials to build the insulating layer and switching gates of their tiny transistors. The

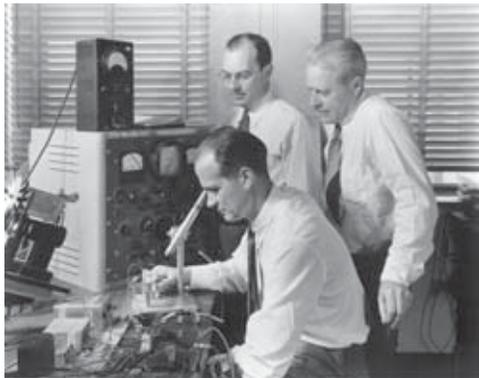
processors are the first to be manufactured on Intel's 45-nanometer manufacturing process, boosting performance and lowering power consumption. As the MOSFETs have shrunk, the silicon dioxide gate dielectric had to be replaced with thicker **hafnium-based** high-k material, reducing gate leakage by more than ten times. The high-k gate dielectric is not compatible with traditional polysilicon used for the gate electrode, so Intel has substituted new **metal** gate materials that also increase the gate field effect.

In addition to increasing computer performance and saving energy use, these new processors have eliminated "eco-unfriendly" lead and, in 2008, will eliminate halogen materials.

The new processors boast nearly twice the transistor density of chips built on Intel's previous 65nm technology — the new products incorporate up to 820 million transistors for quad-core processors.

### Sixty years of semiconductors

The launch of these new multi-core chips comes almost 60 years after the invention of the **transistor** by three scientists at Bell Telephone Laboratories. On December 16, 1947, building on wartime work on germanium crystal mixer diodes for radar, William Shockley, John Bardeen and Walter Brattain



William Shockley, John Bardeen and Walter Brattain invented the transistor 60 years ago in 1947 at Bell Telephone Laboratories, Murray Hill NJ. Photo credit: Alcatel-Lucent/Bell Labs.

made the first practical point-contact transistor that could amplify. In 1950, Shockley went on to develop the junction transistor, an invention that was to have even more practical value than the historical point-contact device.

In 1956, Shockley, Bardeen and Brattain received the Nobel Prize in Physics "for their researches on semiconductors and their discovery of the transistor effect."

## Field Day results

Full results from Field Day 2007 appeared in December's QST and on the ARRL members-only web pages on November 5.



See <http://www.arrl.org/members-only/contests/results/2007/FD/>. PCARA's results were in line with our provisional score — as reported in the July newsletter — as follows:

	Peekskill/Cortlandt ARA, W2NYW					
	2001	2002	2003	2004	2005	2007
QSOs:	450	718	733	968	853	1019
Power	2 (<150W)					
Partcptnts:	16	15	11	12	10	14
Score:	1,540	2,096	2,328	2,996	2,798	2,906

Publication of the complete results allows a comparison of our score with the efforts of neighboring groups in the ENY section and Hudson Division. Overall, PCARA's position was similar or a little better than in 2005. (You may remember that in 2006 our efforts were rained out as Bear Mountain was closed.)

In Field Day 2007, PCARA was...

- **Third** out of 4 entries in Category 2A, ENY section.
- **Eighth** out of 29 entries in the entire ENY section.
- **Seventh** out of 16 in Category 2A, Hudson Division.
- **25th** out of 97 in the entire Hudson Division.
- **167th** out of 477 in category 2A nationwide.
- **589th** out of 2331 entries total.

Here's how PCARA fared compared with some of our friends and neighbors in East New York (ENY Section):

#	Call	Points	Cat	QSOs	Club
1	W2MU	7994	3A	2785	Hudson Valley
2	N2SF	5710	4A	1784	WECA
4	K2AE	4412	5A	970	Schenectady
5	K2PUT	3912	2A	780	P.E.A.R.L.
7	W2YRC	3034	2A	754	Yonkers ARC
8	<b>W2NYW</b>	<b>2906</b>	<b>2A</b>	<b>1019</b>	<b>PCARA</b>
13	W2HO	2030	3A	448	Orange County
19	KB2HAP	696	2A	163	Mountain Gang

Compared with 2005, our position in the ENY table improved from 11<sup>th</sup> to 8<sup>th</sup>. A few hundred points more would have pulled PCARA up several places past Yonkers toward P.E.A.R.L.'s excellent result — they had the top category 2A score in ENY.

Closer examination of the numbers shows that WECA, Yonkers and P.E.A.R.L. all had more participants than PCARA, as well as "GOTA" (Get on the Air) stations for their newcomers that contributed additional QSOs and possible bonus points.

ARRL reports that there was an all-time record of 467 GOTA stations out of 2331 total entries. This year, PCARA was able to claim the new Youth Participation bonus for involving youngsters aged 18 or below in making QSOs. But PCARA still needs more youngsters — especially on Field Day!

– 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. \*Apart from holidays.

## 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

**Dec 2:** PCARA Holiday dinner, "At the Reef" restaurant, 3:00 p.m.

**Jan 6, 2008:** PCARA New Year bring and buy auction, 3:00 p.m. Hudson Valley Hospital Center, 3:00 p.m.

## Hamfests

**Sun Jan 13 2008:** ARRL NYC-LI Section Convention, Ham Radio University, Briarcliffe College, 1055 Stewart Ave., Bethpage, NY.

**Sun Apr 13 2008:** Mt Beacon ARC Hamfest, Tymor Park, LaGrangeville NY.

## VE Test Sessions (No more code tests!)

**Dec 2:** Yonkers ARC, Yonkers PD, 1st Precinct, E Grassy Sprain Rd, 8:30 a.m. Contact D. Calabrese, (914) 667-0587.

**Dec 13:** WECA, Westchester Co Fire Trg Cntr, 4 Dana Rd, Valhall NY. 7:00 p.m. Contact: Stanley Rothman, (914) 831-3258.

**Dec 17:** Columbia Univ ARC, 2960 Broadway, 115 Havemeyer Hall, New York, NY 10027. 6:30 PM. Contact: Alan Crosswell, (212) 854-3754.



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