



PCARA Update



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Raising Lazarus

For those of you that haven't noticed, the 449.925 MHz machine is up and running again after a hiatus of nearly one month.



On a recent visit, Greg KB2CQE shows junior op Ben how he checks operation of the KB2CQE/R repeater on 449.925 MHz.

The extended vacation was due to a mix-up within the building's electrical circuits during a total rewiring project. Apparently the electrician presumed that the circuit breaker that our equipment was on was just a spare, and neglected to hook it up. Thanks to Paul, KH2R with Pamal, the situation has been rectified.

As the result of Malcolm, NM9J's bad influence, my scanner collection has grown yet again. Malcolm had picked up a PRO-433 Trunking Scanner on clearance from Radio Shack, and just **had** to show it to me. Well, guess who had to go out and buy one for himself? Malcolm's malevolent influence is very strong, since he also corrupted Joe, WA2MCR into behaving in a similar manner. Much of the Westchester County EMS and Fire activity now takes place over a Motorola Type II SmartZone system, which requires the use of a trunking scanner to follow the action. Please read Malcolm's article on the PRO-433 in this month's *PCARA Update*.

Over some coffee at Barnes and Noble in the Cortlandt Town Centre (a.k.a. the PCARA boardroom), Joe, WA2MCR, Malcolm, NM9J, and myself came up with an idea for a club activity. What if we held a Geocaching Scavenger Hunt? Geocaching is a type of treasure hunt where items are hidden outdoors in some

type of weatherproof container, and located through the use of GPS devices (<http://www.geocaching.com>). In our version, each cache would have a clue for the location of the next cache, with a requirement for scavenging something specific along the way. As in a Foxhunt, we could give other clues over the air and at the conclusion of the hunt, meet at a local restaurant to share war stories and declare the victor. Just an idea, let us know what you think!

PCARA is going to participate in the September ARRL VHF QSO Party, September 13-15, 2008. Ray, W2CH and Marylyn, KC2NKU have graciously volunteered the use of their home station for the contest. Details will be discussed at the September meeting.

Summer is coming to an end, and that means our monthly meetings are starting up again. Our next meeting is scheduled for September 7, 2008 at 3:00 PM at Hudson Valley Hospital Center. As always, please come join us to share your thoughts, ideas, and suggestions. (Be careful and watch out for construction activity on the hospital grounds.) I look forward to seeing each of you there.

- 73 de Greg, KB2CQE

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Adventures in DXing

- N2KZ

Digitally Ditzzy

The meek shall inherit the earth (or at least VHF television.) With only six months of analog television left, we can only wonder what will remain after the big switch-off day. TV DXers will no longer be inhibited by local stations and front-end overload. Although most full-powered analog stations will forever disappear, low power broadcasters in America and stations transmitting outside the States can and will continue the 70 year old tradition of analog NTSC television. They may enjoy huge increases in audience share! One thing is certain: Future analog TV DX catches will be weak and exotic.



*Reception of Tele Rebelde,
Channel 2, Havana by E-Skip.*

During periods of E-skip, we can certainly expect to still see Cuban broadcasts from services like Tele Rebelde and Cubavision. You'll find them very easy to recognize with their endless airing of test patterns during the late morning and afternoon. When E-skip goes far north, look for Canadian television from CTV, CBC and the French-speaking SRC. Targets already seen in our area include Regina, Saskatchewan, Winnipeg, Manitoba and stations in Maritime Canada like Newfoundland and Nova Scotia.

Locally, a few low power television stations may stay active at least for a little while. A quick check of the FCC database shows nearly all of our local LPTVs have applied to also convert to digital operation. The strongest remaining analog in our area may be W60AI on Channel 60 and WEBR-CA on Channel 17 from New York City. Those in particularly good reception sites may be able to pull in one or more of a co-owned group of LPTVs on Channels 26, 32, 34, 35, and 39. WNYZ-LP on Channel 6 will continue to pretend it has a real FM radio license operating as Pulse 87 FM with a dance music format. While feigning its role as a TV station with visual content, WNYZ-LP has run some interesting footage most memorably long loops of guppies cavorting in a large fish tank!

Die-hard DXers can also find some E-skip and

tropospheric skip activity on the FM broadcast band. Don't forget that the 6 meter amateur band will continue to be available to all classes of licensees. Six Meter hams will no longer fear TVI to Channels 2 and 6. The coming world of digital TV will be an entirely new era devoid of noisy snow and co-channel interference. Some people will miss it but others may applaud!

Digital's dress rehearsal has been bumpy this summer. Powerful WCBS-DT and WABC-DT have both dropped to about half the field strength we have been accustomed to. WNBC-DT, anemic since its sign-on, suddenly became quite robust just before NBC's exclusive coverage of the Beijing Olympics. WNET-DT has disappeared completely and rumored not to be seen again until switchover day next February 17th. The attribute most missing from digital TV around the New York City area is consistency. Regardless of channel allocation, sometimes you'll see it and sometimes you won't. You can write off varying attenuation and loss-of-signal to tropospheric skip, moist cloud inversions or thick foliage on nearby trees. Regardless of cause, life in DTV fringe areas can be frustrating!

Mini in Monochrome

Just in time for the analog switchover, I have come to obtain a tiny analog television. Its screen is about as big as an oversized postage stamp and is surprisingly sensitive. TV tuning is continuous, like an old-fashioned radio, and includes an AM/FM radio and a time-of-day display alarm clock. TV reception is available in three bands: VHF low (2-6,) VHF high (7-12) and UHF (14-83.) During a recent tropospheric opening, I pulled in reception from all over the East Coast with clear pictures from as far away as Hampton Roads, Virginia and North Carolina. I also enjoyed watching Olympics coverage, *en Français*, via the CBC's SRC network from Windsor, Ontario while visiting the Detroit area this summer.



*Karl's mini-analog TV receiving Olympic
coverage from SRC, Canada.*

The little TV, (a Magnavox BD3902,) is about as big as an oversized travel guide. It runs on AA batteries

and plays for hours before reception wanes and your shows fade away. It comes complete with a home A/C adapter, a car battery cord and a protective carrying case. Best of all, the picture is in vivid black and white. Remember black and white? For 1983, this was quite a nugget of technology.

My most fascinating mini-TV experience was discovering just how robust analog NTSC television reception can be while traveling in a car. No matter what the terrain, you can usually pull in one or more reasonably stable stations, using just the attached short monopole whip antenna, while sitting in the front passenger seat. I also noticed that several cable TV channels, outside of the over-the-air allocations, will sneak into this set if you hook it up using its external antenna connector. It's a lot of fun, but I have to enjoy it quickly. I have only six months more left before analog over-the-air TV disappears.

Capracorn

Summer vacation also allowed me to enjoy participating in the original Old Goat's Net appearing daily on the Lake Huron Amateur Radio Club repeater, at 145.47 MHz

-600 offset with no PL, daily at 8:30 am (except Sunday.) Using just my Icom IC-T7H HT, at 5 watts or less, I have to roam to a known good spot in the corn fields to hit the repeater,



Karl's Icom IC-T7H dual-band handi-talkie.

located in Bad

Axe, Michigan, about 20 air miles away from my vacation QTH. Attendance is unusually good, with a dozen or more participants on any given morning. Hams check in from several counties and one regular member booms in from across Lake Huron transmitting from Goderich, Ontario. Just how old are the Old Goats? Sometimes the net's cumulative age exceeds 1000 years!

Please remember you can be an Old Goat too! The Old Goat's Net (East Coast Edition) appears weekly on the PCARA repeater, 146.67 MHz -600 offset 156.7 PL, Thursday nights at 8 pm. (Peekskill, New York is a lot closer than Huron County, Michigan!) See you there! Until next month,



- 73 de N2KZ dit dit.

Sirius add-on - W2CH

I recently had the Sirius Satellite receiver and interface added to my JVC HD automobile receiver, replacing the XM SkyFi receiver and modulator which I had in my Camaro for about 5 years. I had to order the Sirius receiver from Crutchfield in Virginia and then have it installed in place of the XM receiver set up. The removal of XM and installation of Sirius was done at Best Buy. It took the installer about an hour and a half. He also had to change the antenna on the car.

The XM SkyFi receiver will now stay with the boombox unit for portable use. As you can see by the photo, the setup is much neater in the car and the sound is better too than using the SkyFi's FM modulator.



Ray's JVC HD car radio now includes a SiriusConnect tuner and adapter package.

I had to establish a Sirius account on their website, and activate the new receiver in the car. As you may know, the two parent companies of XM Radio and Sirius completed their merger on July 29, 2008.

Sirius has stated that there will be new choices in a few months for reception packages of channels such as music, news/talk, and sports. What this will be like or cost I do not yet know. Sirius and XM do not yet plan to merge in Canada, where Sirius is available through stores such as "The Source", which was previously InterTan/Radio Shack. The Source is owned by Circuit City.

- Ray, W2CH.

Indian Point sirens

In August, Entergy said it was ready to place Indian Point Energy Center's new Siren Alert Notification System in service, but is waiting on Federal Emergency Management Agency approval. FEMA will require one year of acoustic and reliability testing before allowing the old system to be dismantled.

Tone-alert radios will be offered to about 2,500 homes to augment the siren system. The radios would be mains-powered with battery back-up and would monitor the Emergency Alert System broadcasts.



New and old sirens in Locust Avenue.

Scanner for the Manor

In the beginning, scanning receivers were crystal controlled and limited in how many frequencies they could monitor. As technology improved, programmable scanners began to appear. One of the first I ever saw was an SBE Optiscan receiver, used by Lancashire Police at their HQ in Hutton, England in the late 1970s. This unit was programmed using a small plastic card with clear or blackened spaces to hold the frequencies in binary format. A few years later, keyboard-programmed scanners became more common, and in the early 1980s I acquired a used, Bearcat 220FB 20-channel scanner.



Bearcat 220FB from early 1980s covered European "low band" of 66-88 MHz plus 118-136, 144-174, 420-512 MHz.

Scanning in the UK was (and still is) a dubious pastime – officially, the public can only listen to broadcast and amateur radio transmissions. Listening to the police and fire services was forbidden – even though they once used VHF frequencies in the middle of the 88-108 MHz broadcast band!

On this side of the pond, I began scanning in 1986 with a Bearcat 175xl 16-channel scanner, then in the 1990s graduated to a Radio Shack PRO-2035 1000 channel scanner. The BC175xl is still in use for monitoring business band radios at work.

The PRO-2035 has proved quite adequate for local listening for well over a decade.

On a recent visit to the local Radio Shack store at the



Radio Shack PRO-2035 1000 channel scanner, dates from 1994.

Beach, I noticed they had a close-out offer on the **PRO-433 scanner**. This is advertised as a 1000 channel **trunking** scanner, designed to track Motorola Type I and Type II hybrid analog systems amongst others. The scanner was reduced to \$119.97 with an additional promo reduction of \$12.00.

This price was too good to pass and I was able to see how far scanners have progressed in the last 10-12 years. The PRO-433 packs a lot into a small space – the metal case is designed to fit a DIN-sleeve for automobile in-dash mounting, or it can be used with the external 12 volt DC power supply in a fixed location.

A short word about trunked radio systems – this is one method of making better use of a limited number



Radio Shack PRO-433 trunking scanner, introduced in 2006.

of radio frequencies to satisfy a large number of users, and is similar to the concept of having just enough trunk lines to interconnect a large number of phones on different telephone exchanges.

In a trunked radio system, all the mobile radios monitor a special control channel, dedicated to digital signaling. Mobile users with common interests are allocated to a "talkgroup". When a message intended for a particular talkgroup is being broadcast, the control channel announces the fact, along with details of the frequency (channel number) to be used. Mobile radios assigned to the talkgroup then switch channel automatically to receive the broadcast.

This arrangement allows the various talkgroups to have access to their own, private communications as though each group had its own dedicated frequency. In practice, a small number of frequencies is being used more efficiently, and problems only arise when there is a sudden surge in activity by all the groups.

In Westchester, the county has a trunked radio system for fire and ambulance that is just one year old this September and which relies on Motorola Type-II UHF technology. It provides inter-communication between Westchester's Emergency Communications Center in Valhalla (60-Control), fire departments, ambulances, hospitals, police and buses. The Motorola radios look similar to a standard FM radio with the usual knobs for volume and channel. Mobile users are told to hold down the PTT button as usual, but they must wait for a confirming tone (similar to the "chirp" on a Nextel Direct Connect phone) and a transmit LED before proceeding with their message. A busy tone and LED indicate that all the radio channels are in use and the



"60-Control" in Valhalla provides primary dispatch for Fire Departments and Emergency Medical Dispatch for EMS Agencies in Westchester County. Their main frequency is 46.26 MHz. The control center is so-called because Westchester is 60th on an alphabetic listing of New York State's 62 counties.



Antennas on Benefield Blvd water tank.

Ossining, Keeler Lane in North Salem, Bedford Lane in Bedford and Adams Lane in Pound Ridge. The southern zone locations are at Westchester's Valhalla radio tower, at Dunwoodie Golf Course in Yonkers and at Summit Avenue water tank in Port Chester.

Stumbling Start: After a difficult start, I was able to program the PRO-433 for Westchester's new trunked radio system. Radio Shack's own User's Guide is very poor, and I found much better programming instructions at the Yahoo Groups forum, http://tech.groups.yahoo.com/group/PRO-433_scanners.

Five minutes after trying to program the PRO-433 from the front-panel, you will realize that there must be a better way! Fortunately, Uniden/Radio Shack includes a 1/8" front panel PC/IF (Personal Computer/Interface) jack for unit-to-unit cloning and PC programming.

The first item you will need is a suitable programming cable. Radio Shack no longer sells the # 20-289 serial cable but they do sell the # 20-047 USB programming cable, complete with a CD-ROM containing the USB drivers — but no programming software. On the PRO-433, be sure to use the 1/8 inch stereo-to-mono jack converter for the front panel PC/IF connector.

As far as programming software goes, the best

caller must wait. The system uses twelve UHF channels in the 470 MHz range — six north and six south, with antenna locations for the northern zone at Benefield Boulevard water tank in Peekskill, Mohansic Golf Course in Yorktown, Pinesbridge Road in

choice seems to be Butel's ARC433. This can be downloaded for a very reasonable \$29.95 from the Butel web site, <http://www.butel.nl>. As well as reading from and writing frequencies to the 10 channel banks, the Butel software also allows you to set up trunked radio parameters for each channel bank as well as the "chain search" parameters that allow scanning of preset frequency ranges for each bank.

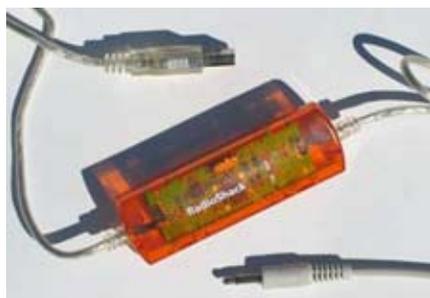
Another resource you will need is a good source of frequency data. I found RadioReference, <http://www.radioreference.com>, an excellent source of trunking and frequency information, as well as the type of radio system in use (analog FM or APCO P25 digital), tower locations, power etc.

Extras: There are a number of additional features in the PRO-433 that were not present in my previous 12-year old scanner. As a helpful start, the scanner is pre-programmed on channels 1-150 with well-used national frequencies for Police, Fire, Air, Amateur, Marine and other services. Another built-in feature is "Signal Stalker I", which can scan a wide range of frequencies and store just the very strongest signals from local sources. Another useful feature is the "Service bank search" which scans preprogrammed bands allocated to Amateur (Ham), Marine (Mrn), Aeronautical (Air) and Police (Pol) services. The weather scan can be programmed from the front panel for Specific Area Message Encoding (SAME), but this is not available in the Butel software.

Frequency coverage of the PRO-433 is quite wide for an inexpensive scanner. It covers 29-54 MHz, 108-174 MHz, 180-512 MHz, 806-956 and 1240-1300 MHz. This includes the 222 MHz amateur band, Military air and 23 cm amateur band.

Downside: This is not a deluxe scanner, so certain features are missing. One is the capability to describe frequencies and talkgroups with meaningful, alphanumeric labels. Another is the ability to detect and reject signals with subaudible (PL) tones and digital private line coding. The PRO-433 will only detect analog audio transmission — FM and AM are included but digital audio such as APCO P25 is *not* available. A scanner with all these features included might cost closer to \$500.00 than \$100.00. The PRO-433 scanner's built-in loudspeaker is mounted at the bottom of the case and is covered up if placed on a shelf. A simple fix is to use the mounting bracket to raise the case, or plug in an external speaker.

Summary: Scanners have advanced in leaps and bounds recently, and you may want to update like I did. If you cannot find the PRO-433 on closeout, take a look at its more modern cousins from Radio Shack or Uniden. - NM9J, Cortlandt Manor scanner



Radio Shack #20-047 USB scanner programming cable.

Essential₂ clarity

This is a further episode in the occasional series where we take a look at chemical products that are indispensable to the radio amateur. The American Chemistry Council's "Essential₂" campaign seeks to explain how the chemical industry is "essential₂" our lives.

One item that we frequently look straight through and forget about is the **glass** in our window frames, our picture tubes and even our watch glasses. Glass has several important uses in our radio shacks, and I hope to persuade you not to overlook it.

We covered one use of glass in the first *PCARA Update* "Essential₂" article that described liquid crystal displays (LCD). Back in July 2006, I explained how the liquid crystals, color filters and transistors are held between two sheets of glass substrate, with a transparent, conducting film of indium tin oxide deposited on the glass surface. The transistors that turn the pixels on and off are built up on these glass sheets using photore-sist techniques similar to an integrated circuit. Next time you see someone poking at an LCD with his or her finger, bear in mind that the glass substrate is less than one millimeter thick and that it is quite vulnerable to cracking if impacted.

Long before the existence of liquid crystal displays, transistors or television, high performance glass was playing an important role in radio history. But we are running ahead of ourselves — let's first take a look at how traditional glass is made.

Common soda-lime glass, as used in windows and bottles, is manufactured from sand (silica, SiO_2), sodium carbonate (Na_2CO_3) and lime (calcium oxide, CaO) plus other materials such as dolomite ($\text{CaMg}(\text{CO}_3)_2$). The ingredients, along with some recycled glass, are heated in an electric or gas-fired furnace to 1500 deg C to melt them all together. This forms a liquid mixture of sodium silicate, calcium silicate and excess silica that can be poured, drawn, blown or pressed into shape while still mobile. As the glass cools down, it maintains its amorphous structure, and this disordered atomic configuration is frozen into the solid state. The unusual solid structure with its freedom from crystallization gives glass its transparency.

Pyrex glass is made by replacing some of the sodium carbonate in soda glass with sodium borate, $\text{Na}_2\text{B}_4\text{O}_7$. The resulting "borosilicate" glass has a very low coefficient of expansion and is extremely tough. First discovered in Germany in the 1880s, it was further developed in the early 1900s by Corning Glass Works to answer a request from the railroads. Their kerosene-burning signal

lanterns with glass lenses ran very hot, so if rain or snow fell on the glass, it could shatter and the signal would fail. Corning developed globes made from low-expansion glass that could withstand weather and handling much better than regular glass. This super-tough "fire glass", as it was called, was resistant to temperature fluctuations, chemical corrosion and breakage.

In 1915, Pyrex glass was also developed for ovenware, after the wife of one of Corning's scientists successfully baked a cake in a sawn-off glass battery jar. Pyrex was then put to good use as an excellent electrical insulator. In the early days of radio communication, insulators were needed to suspend the wire antennas and to carry the wire feeders into the shack. One favored type of insulator was made of Pyrex glass by Corning Glass Works. According to Corning in 1928:



Railroad signal lantern was an early application of borosilicate glass.



Pyrex insulator, 1928.

"Radio energy in all its original volume is delivered by antennae equipped with Pyrex Insula-

tors. Signals from even the most distant stations reach the detector unweakened by leakage or eddy losses.

"The special glass from which Pyrex Radio Insulators are made has the lowest power loss of any known substance suitable for antenna insulation, with the exception of fused quartz. The smooth hard surface prevents accumulation of dirt and soot.

"Specified wherever perfect insulation is of vital importance — in the U.S. Navy, Coast Guard, Light-house and Air Mail — and in the country's largest broadcasting stations."



Modern glass insulator.

Porcelain is also used for large antenna insulators, but compared to glass, porcelain has the disadvantage that it is not transparent, so it is difficult to see internal voids — voids that may very well lead to stress failure of the entire insulator when it is in service.

Corning went on to say that: "Pyrex Radio Insulators are made from a special glass, developed by Corning Glass

PYREX

Works, which possesses an unusual combination of electrical, mechanical and chemical properties, making them an effective barrier against leakage and eddy losses.”

In addition to antenna insulators, glass saw widespread use in the 20th century for the manufacture of vacuum tubes and cathode ray tubes. Metal connections could be sealed into the glass, providing a conducting path to the vacuum tube electrodes. With the correct choice of glass and lead-in material, the seals were leakproof and a good vacuum could be maintained inside the glass envelope for decades. In the early days, platinum was used as the lead-in-wire, but this expensive metal was soon replaced by cheaper alloys that expand at the same rate as the glass. Examples include “Dumet” and “Kovar”.

Dumet wire is a copper-clad wire with a core of nickel-iron alloy, having a low coefficient of thermal expansion to match that of soda lime glass. It is used in vacuum tubes, cathode ray tubes, fluorescent tubes and filament lamps. Dumet seals can be identified by their red appearance within the glass. Kovar is a nickel-cobalt-iron alloy designed to be compatible with the thermal expansion characteristics of borosilicate glass. Kovar is employed in power tubes, X-ray tubes and microwave tubes.



Borosilicate glass is used in power tubes like this European QV06-40A (5894A) dual tetrode for VHF/UHF transmitters. The tube is internally neutralized and has the two separate anode connections brought through a tough, heat-resistant seal at the top of the glass envelope.

Modern plate glass for mirrors and windows is manufactured by the float glass process, invented by Pilkington Brothers during the 1950s in the UK. The molten glass is poured onto a flat surface of molten tin that allows the glass to be pulled down a line where it can cool while still being maintained perfectly flat, with an even thickness. (In the early 1980's I was able to see a float glass line in production, when my radio club joined a fascinating tour of Pilkington's glass factory in St Helens, led by Gerry, G3KTJ.)

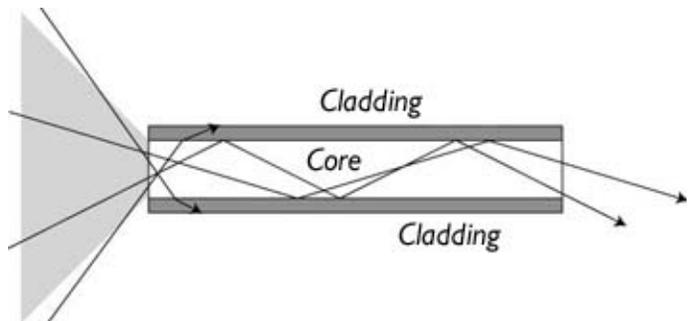
Large glass panels for liquid crystal displays are formed in Corning's "Fusion Process" by feeding molten

glass into a trough until it fills and glass flows over both sides. The glass then rejoins beneath the trough, where it is drawn down to form a continuous sheet of flat glass.

The latest application of glass in long-distance communications is the fiber optic cable. This operates on the principle of total internal reflection, where light moving through a dense medium is 100% reflected at the boundary with a less dense medium, provided the angle of approach is not too steep. In a fiber optic cable, light enters a core glass fiber and bounces around, reflected by the outer cladding of glass with a lower refractive index.



Corning fusion process for making LCD flat panels.



Light injected at a sufficiently low angle into the core of an optical fiber is continuously reflected at the junction with the cladding, which has a lower optical density than the core.

Manufacture of glass-based optical fibers was pioneered by Corning. The process starts with a large-diameter glass preform, having a controlled refractive index profile. The tip of the molten preform is then pulled down a drawing tower to form a long, thin optical fiber. The preform is made by chemical vapor deposition methods onto the inside of a glass tube or onto the outside of a glass rod.

From antenna lead-ins to fiber optic cables spanning the globe, glass has been part of world communications for over a hundred years. I suspect it will be with us for the next hundred.

- NM9J

State radios

Following a critical audit by the state comptroller, New York State may revoke a \$2 billion contract with M/A-COM to build a statewide 700/800 MHz radio network for emergency responders. A first installation in Erie and Chautauqua counties suffered equipment failures and longer outages than the contract allows, according to the Office for Technology.

Wartime wireless - N2CBH

Ham radio during World War II is an interesting subject. It is interesting in that during the war there were virtually no authorized ham radio transmissions in the U.S.! Imagine that for a period of three years you could not operate your rig. This and other interesting facts are what I decided to write about for this month's edition of the *PCARA Update*.

In 1939 there were a mere 51,000 licensed amateurs in the U.S. War broke out in Europe on September 1st 1939 with the German invasion of Poland. This action immediately changed the amateur radio landscape. Nearly half of the then DXCC nations went off the air as a result of this action. This included Canada and the United Kingdom. U.S. amateurs adhered to a code of neutrality. This code was developed by none other than the ARRL. This was a voluntary code which was practiced by nearly the entire American amateur population.

More stringent operating restrictions would follow in the following year of 1940. A ban on communication with hams outside of the U.S. was instituted along with a prohibition against portable operation below 6 meters except for Field Day operations. No doubt this was done to reduce the possibility of clandestine communications.

One has to remember that portable communications nearly 70 years ago was no small feat. There were few designs that didn't require A.C. mains to operate, which made portable operation difficult. Ironically World War II would produce some ingenious designs for battery operated sets for both receiving and transmitting.

There were some operations sanctioned by the government at the behest of the ARRL that allowed some portable and mobile operations for the purposes of training, which would become extremely valuable to the military in a short time.

The role of amateur radio operators during hostilities that involved America was important and at times resembled that of the role of any other branch of the government. For example, the F.C.C. looked to the amateur radio community for volunteer listening post operators. Within a short time the quota for 500 volunteers was filled by U.S. amateurs. Many other operators were called to active duty. In fact nearly half of licensed amateurs were in uniform before the end of the war. The other half remained at home as listeners, training volunteers and members of the WERS service which I will talk about in a short while.

There were other signs that things were going to get worse for the amateur, including the growing shortage of parts and vacuum tubes. Hams were asked to donate critically needed components for the war effort and they emptied their junk drawers and donated

many needed items. Before the end of the war there were no vacuum tubes or electrical parts available for sale to the public. Most daily staples were rationed or simply not available. No running down to Home Depot on a Sunday back then!

By 1941 hams were limited to communications amongst themselves in the U.S. from fixed stations. The military decided that it needed the 80 meter band and so hams lost 80 meters temporarily. As a consolation the F.C.C. granted U.S. amateurs phone privileges on 40 meters for the first time. Previous to World War II hams had only CW privileges on this band.

To quote President Franklin Roosevelt: "December 7th, 1941 — a date that will live in infamy", was when the U.S. was attacked by Japan at Pearl Harbor, Hawaii and it was also the date that all U.S. radio amateurs were ordered to observe radio silence. The ban on transmission would last for the duration of the war, which ended in 1945. A notable exception to the ban was the transmissions of the ARRL station W1AW.

Another activity that continued during the war was that of licensing. It was assumed that the war would end, hopefully sooner than later and the ban would be lifted allowing these newly licensed operators to get on the air for the first time. The licensing effort served another important function. It helped train countless men and women who would go into the armed services and would require communications skills. Still others would need electronics training and they got it from studying for an amateur license.

The War Emergency Radio Service was created in June of 1942 at the urging of the ARRL. WERS was developed to create an emergency communication



A War Emergency Radio Service transmitter-receiver keeps this air raid warden post in direct communication with the community Civilian Defense Control center. The set was constructed out of old home receivers by civilian radio volunteers. [Library of Congress picture.]

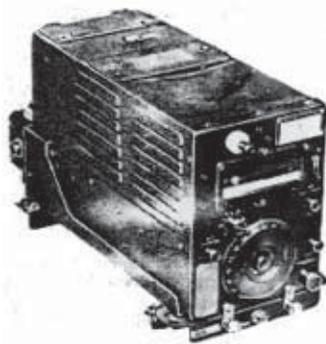
service to aid during air raid drills and protection. While not an amateur service it was manned mostly by amateur radio operators. The service operated on VHF in the 2½ meter band, which at that time was allocated to the amateur radio service. Later on it would be part of the spectrum that is now occupied by aircraft communications. This band would provide good point to point communication — while it would not be useful to anyone trying to communicate outside the U.S.

One privilege that Hams did have during the radio silence period was that of carrier current operation. Instead of using a conventional antenna system such as a dipole or wire antenna, carrier current uses the electrical A.C. mains in place of an antenna. By use of a specially made coupler it is possible to inject R.F. onto an A.C. mains line and have some propagation. Power was limited and R.F. doesn't travel past an A.C. transformer so communication was generally limited to a few blocks. You might be able to communicate with a neighbor but that was about it. Carrier current is still used today for limited broadcasting mostly on college campuses using the AM broadcast band. I know of at least one amateur who tried this mode of operation during the war who reported poor results — as in no contacts at all!

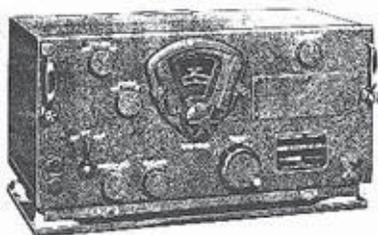
Thankfully the war ended in 1945 with the surrender of the Japanese in August of that year. Before long amateur radio was back on the air in a very different world. After VJ day, amateurs were allowed privileges on the 2½ meter band to be shared with WERS service, which ended by November 15th 1945. By then amateurs were back on H.F. and things began to settle back to normal.

The post war period would begin with large amounts of surplus gear to be modified and used by post war hams. ARC-5 transmitters and BC-348 receivers are just two examples of radios that would be owned by many hams for years to come. I in fact own an ARC-5 transmitter and a BC-312 receiver from that era. Even at today's hamfests you can still see remnants of war production for sale or on display.

Other products that came in to being during the war included miniature all-glass tubes of the



ARC-5 transmitter



BC-348 receiver

seven-pin variety. Examples of these tubes include the 12AU6. Nine pin glass tubes such as the 12AX7 followed.

The germanium detector diode is another product of the industrial war effort. Modern plastics would replace brittle bakelite in electronic cabinets and some parts were also war developments.

Most hams alive today that lived through the World War II era will



1N34A germanium diode

probably say that the amateur radio hobby suf-

fered little inconvenience compared to the millions of citizens and soldiers who lived and died during World War II. It makes you want to be very thankful for the sacrifices of those who gave their lives and suffered under terrible circumstances. The next time you flip on your rig to enjoy this hobby today take a few minutes to remember those who sacrificed so many years ago so that you could speak freely to anyone within the reach of your shack.

-- 73, Bob N2CBH



7-pin all-glass vacuum tube (6AU6)

Cable changes

From September 16 2008, Cablevision is switching off analog transmission of its Public Access, Education and Government ("PEG") services. In our part of Northern Westchester this affects Public Access channels 15 and 18, Educational Channel 77 and Government Channel 78. Putnam Valley and Yorktown have slightly different allocations – they use analog channels 18, 20, and 74.

Service will still be available to viewers with digital cable ready televisions or digital cable boxes. Viewers with an analog cable box or no cable box at all are invited to call Cablevision before October 16 on 1-800 353-9821 or (914) 962-4444 and select option 3. Cablevision will then provide one "free" digital cable box for up to a year. The standard cost for a digital set top box is around \$6.50 per month.

Cable companies are being driven to remove analog channels because of the greater efficiency of digital transmission. In the space of one analog NTSC 6MHz channel, they can transmit two to three high definition digital signals, or ten to twelve standard definition signals. The change to all-digital cable is a decision for the individual cable company. But as long as a cable company provides *any* analog service, the FCC requires the company to continue analog service for local broadcast stations for at least three years after the over-the-air transition to digital on Feb 17, 2009.

Peekskill / Cortlandt Amateur Radio Association

Mail: PCARA, PO Box 146, Crompond, NY 10517

E-Mail: w2nyw@arrl.net

Web site: <http://www.pcara.org>

(Alternate address: <http://www.geocities.com/pcara2000>)

PCARA Update Editor: Malcolm Pritchard, NM9J

E-mail: NM9J @ arrl.net

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

Sun Sept 7: PCARA meeting, Hudson Valley Hospital Center, 3:00 p.m.

Sept 13-14: ARRL VHF September QSO Party.

Hamfests

Sun Sept 14: Candlewood ARA Hamfest, Edmond Town Hall, Newtown, CT. 8:30 a.m.

Sat Oct 4: Bergen ARA Fall Hamfest, Westwood Regional HS, 701 Ridgewood Rd, Washington Twnshp, NJ. 8:00 a.m.

Sun Oct 5: Hall of Science ARC Hamfest, New York Hall of Science 47-01 111th St., Flushing Meadows, Queens, NY. 9:00 a.m.

VE Test Sessions

Sep 7: Yonkers ARC, Yonkers PD, 1st Precinct, E Grassy Sprain Rd, 8:30 a.m. Contact D. Calabrese, (914) 667-0587.

Sep 11: WECA, Westchester Co Fire Trg Center, 4 Dana Rd, Valhalla NY. 7:00 p.m. Contact: Stanley Rothman, (914) 831-3258.

Sep 15: Columbia University, 2960 Broadway, 115 Havemeyer Hall, New York. 6:30 p.m. Contact Alan Crosswell (212)854-3754.

Sep 19: Bergen ARA, Westwood Regional HS, 701 Ridgewood Rd, Washington Twnshp, NJ. Contact Donald Younger, (201) 265-6583.

Sep 27: PEARL, Putnam Co. Bureau of Emergency Services, Training and Operations Facility, 112 Old Route 6 (Donald Smith Campus), Carmel. 10:00 a.m. -12 noon. Contact NM9J.



Peekskill / Cortlandt Amateur Radio Association Inc.
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