



PCARA Update



Volume 11, Issue 1 Peekskill / Cortlandt Amateur Radio Association Inc. January 2010

Boatloads of good cheer and good gear

Add another successful PCARA Holiday Dinner to the record books. The December 13th gathering at *At the Reef* for the 2009 PCARA Holiday Dinner was very well attended and even the adverse weather couldn't keep friends away. The food was excellent and the friendship and camaraderie priceless!



Happy faces around the table for PCARA's 2009 holiday dinner "At the Reef".

Now is a good time to clear away some of your old gear to make room for all of the new toys Santa brought you for Christmas. "What might you do with some of that old equipment?" you might ask. Well, how about bringing some of it with you to the January 3, 2010 meeting at Hudson Valley Hospital Center, for the annual PCARA Bring and Buy Auction? This is a great opportunity to recycle some of your less used and dated equipment and maybe pick up a couple of things that Santa just couldn't fit in his sleigh or your stocking this year. Oh, and don't forget to bring your cash!

At the January meeting we will be discussing the special event station that will be held in the late Spring/early Summer 2010, commemorating a decade (yes 10 years!) of PCARA's official community service.

If you have any ideas or suggestions, please let us know or bring them with you to the meeting.

Our next meeting is January 3, 2009 at 3:00 PM at Hudson Valley Hospital Center. I look forward to seeing each of you there.

- 73 de Greg, KB2CQE



The annual PCARA Bring & Buy Auction takes place on Sunday January 3.

PCARA Officers

President:

Greg Appleyard, KB2CQE, kb2cq@arrl.net

Vice President:

Joe Calabrese, WA2MCR; wa2mcr@arrl.net

Net night

Peekskill/Cortlandt Amateur Radio Association holds a weekly net on the 146.67 MHz W2NYW repeater on Thursdays at 8:00 p.m. Join net control Karl, N2KZ for neighborly news and technical topics. (Exception -- no net on New Year's Eve/SKN, Dec 31.)

Contents

Boatloads of good cheer and good gear - KB2CQE	1
Adventures in DXing - N2KZ	2
Essential2 sliding - NM9J	3
What's old is new again	4
Radio Cortlandt TC	7

Adventures in DXing

– N2KZ

A New Decade

'Tis the season to be jolly! It is time to move past auld lang syne! May one of your resolutions be: "A QSO a day keeps the doctor away!" You'll also fill up your logbook and your mailbox! Remind yourself that **all** licensed amateurs indeed have HF privileges these days. All you need is a Morse Code key and a wee bit of ambition. If you like, I'll be pleased to meet you on the air for a v-e-r-y slow CW QSO on 3525 to 3600, 7025 to 7125, 21025 to 21200 and 28000 to 28300 kilohertz. You can even operate *phone* on the hot 10 meter band from 28300 to 28500 kilohertz. Ten meter antennas can be tiny and still be effective. Be there or be square!



Karl, N2KZ will be pleased to meet you on CW.

New Year's Day is a great time to start your career in slow CW. Check out the ARRL's Straight Key Night. It's a celebration of slow code sent by true brass pounders all over the country and beyond. No rapid automatic electronic keyers are allowed! Many hams only operate CW on this one night and lots of newcomers come out of the woodwork, too. Listen in from 7 pm on New Year's Eve until 7 pm New Year's Day especially on 80 and 40 meters. Give it a try!



All you need for SKN.

Not operating? There can be no excuses! You don't need elaborate equipment to operate on HF. I have worked the world on ten meters from my car with just a shortened CB magnet-mount loaded whip antenna running 25 watts. Is New Zealand far enough away for you? All you have to do is pick up a microphone and start calling. The world awaits you! On HF, Technicians have a power limit of 200

watts. This is no handicap. To me, this is about 200 times more power than you really need! Make the effort! See you there!

Happy Anniversary

New Year's Day is a time of holy obligation for this seasoned QRP CW operator. It has been ten wonderful years since I first went on the air. My first QSO was on January 1, 2000 at 4:30 pm Eastern Standard Time on 3700 kHz. I had a very brief QSO with Harold, W1EES, on 80 meter CW. Ten years and many log pages later, I continue to work the CW bands with passion finding thrills daily. You can't beat this hobby!

The End of Glass

This past year marked the end of most analog television and the wide acceptance of LCD, plasma and LED televisions and displays. Those big and heavy glass-tube CRT monitors are becoming a thing of the past. I recently have witnessed this at work. An edict came from a manager up high saying "All glass must go!" Since then, when we have been clearing out old edit rooms and other teleproduction facilities, all of our glass monitors have headed for the recycling bins. Our main supplier, Sony, no longer makes CRT monitors at all. It's all mesh and plastic flat screens now. Some of our all-color LCD monitors are as small as a large postage stamp. Samsung is marketing a large screen TV that is only 6.5 millimeters thick. It's magic! Welcome to the new decade!

No Spots? Odd Shots!

In recent months, low band propagation has behaved unlike I have ever seen it before. The lack of sunspots has created phenomenal results far beyond the 80 and 160 meter bands. I often listen to overnight and early dawn AM radio and distant reception has been so strong and deep it's confusing!

Many nights, WWL 870 New Orleans and WLS 890 Chicago are so strong that I can just barely pull local WCBS 880 out of the brew. Powerful CHML 900 from Hamilton, Ontario doesn't help! I checked a map. WCBS is only 41 air miles from my QTH, yet the skywave continues to be so huge WCBS' groundwave simply can not compete. Usually rare KOA 850 Denver has shown up often. Iowa has been no stranger with regular appearances from KXEL 1540 Waterloo and KCJJ 1630 Iowa City.

WFAN 660 and WCBS 880 share a tower on High Island off City Island in the Bronx. I was lucky to notice they were both off the air one overnight. In their place were the Navajo Nation's KTNN 660 Window Rock, Arizona and bluegrass music from CKLQ 880 Bran-



don, Manitoba. My trusty GE Superadio continues to serve me well.



GE SuperRadio 2 as used by Karl for long distance AM reception.

Great things can be heard on opposite sides of the AM broadcast band. Longwave DXers have recently registered some very exotic catches from Greenland, Iceland and the Faroe Islands. Use regular visitors like 162 France Inter and 252 RTE One Ireland as indicators of across the pond reception. Both stations can be heard fairly regularly these days. For a comprehensive list of longwave stations, visit Bill Hepburn's amazing site at: <http://www.dxinfocentre.com/>.

And don't forget 160 meters just above the AM broadcast band! PCARA's award winning DXer Joe, WA2MCR, can tell you all about it! Enjoy this opportunity while the high bands are inactive. There is plenty of exotic DX if you know where to find it!

Late News: A new digital NYC TV station is on the air — WASA-LD channel 25, virtual channels 64-1 and 64-2. And on satellite, DirecTV is dropping XM Radio audio channels in February. Another, lesser-known, service will take its place with more ethnic channels.

Old Goats Want You!

The PCARA's weekly on-the-air get-together needs new recruits! Turn on your HT or base rig and join us for some fun. Mark your calendar for every Thursday night at 8 pm Eastern local time! Look for us on 146.67 MHz with a minus 600 kHz offset and a 156.7 PL. Push your PTT button and join us on the air!

The past year has brought us hours and hours of interesting entertaining and educational chat. We have hosted visitors from Long Island, Manhattan, New Jersey and even the Binghamton area. Wonder what Priscilla Presley and Donny Osmond have in common with you? Want to know how a 350 pound boat anchor found its way from Russia to America? You'll never know unless you listen to The Old Goat's Net! It's now easier than ever. The PCARA two-meter repeater can be heard live at: <http://www.radioreference.com/apps/audio/?feedId=3186>.

Happy New Year and see you on the air!

- 73 de N2KZ The Old Goat dit dit.



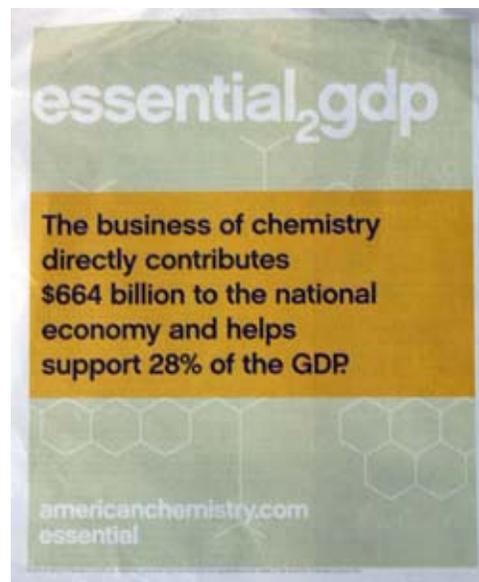
Back in

Essential₂ sliding

Since June 2009, the American Chemistry Council has been de-emphasizing its \$20 million per year "Essential₂" advertising campaign. As a result, you will no longer be seeing advertisements in magazines and on TV explaining how chemistry and chemical products are essential to everyday life. But there are still plenty of chemicals in the radio shack and workshop worth a mention in these pages – so here goes on our next installment.

Back in July 2008, we took a look at motor oils and the additive packages that help maintain their desirable properties. The oil acts as a lubricant, allowing moving components to slide past each other without seizing up. Oils are fine for gasoline engines, but there are places around the radio shack where a liquid lubricant such as motor oil would be most unsuitable. Liquid lubricants have their problems — a low viscosity liquid could flow and drip away from moving parts, and the exposed surface of a liquid lubricant could trap dust and dirt.

In place of a liquid lubricant, we can substitute a semi-solid lubricant. One example is petroleum jelly, which is a blend of mineral oil, paraffin and microcrystalline waxes. The beginnings of this product go back to 1859 when a young chemist from Brooklyn named Robert Chesebrough was visiting a Pennsylvania oil well. Chesebrough noted that the oil workers were applying a dark, waxy residue from the drill to their skin to speed up healing of cuts and burns. He took some of the "rod wax" back with him and found that he could refine it by vacuum distillation, produc-



One of the last "Essential₂" print ads published by the American Chemistry Council, from May 2009.



Robert Chesebrough

ing a light-colored gel. Chesebrough opened the first factory for his new product in Brooklyn in 1870, then patented the product in 1872. It was widely sold as **Vaseline** to encourage healing and protection of the skin. Vaseline's melting point is just above body temperature, so it melts into the skin, flowing into spaces between cells and other gaps. The thin film of Vaseline protects the surface of wounds from infection by bacteria.



Early Vaseline bottle

As well as protecting the skin, Vaseline can prove useful around the shack and around the home. If you have light fittings that tend to seize or corrode, a little dab of Vaseline on the screw threads will stop them seizing when it's time to remove the bulb. This can be especially useful for outdoor light fittings. Nuts and bolts can also be prevented from rusting by applying a thin coat of Vaseline to their threads before use. Lead acid batteries can suffer corrosion around their terminals – a thin layer of Vaseline applied to the battery posts before connectors are tightened down will fix the problem. If the terminals were already corroded, clean with a wire brush and sodium bicarbonate solution beforehand.

In these types of electrical contact application, petroleum jelly is superior to silicone grease. As mentioned previously, silicone grease has a tendency to decompose to non-conducting silica whenever there is arcing at the electrical contacts.

If you have a rubber gasket that is not sealing properly, clean the surfaces and coat the rubber with a little Vaseline before tightening the fitting.

To finish off, what of Robert Chesebrough's Brooklyn company? It went on to open manufacturing plants in Europe, Canada, and Africa. Vaseline was used in both World Wars to treat minor cuts and burns. In 1955, Chesebrough Manufacturing Co. merged with cosmetics manufacturer Pond's Extract Company to form Chesebrough-Ponds, Inc. And in 1987 Chesebrough-Ponds was acquired by the Anglo-Dutch company Unilever.

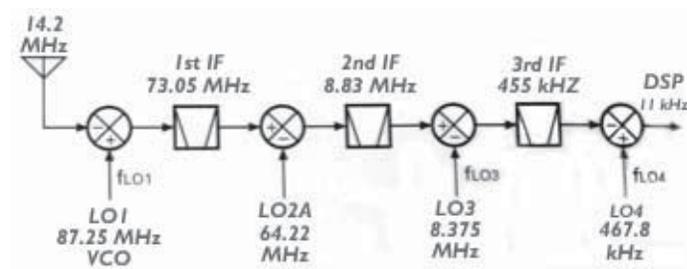


Vaseline from the UK

What's old is new again

As we say goodbye to the "noughties" and move into the second decade of the 21st century, one of the interesting trends in receiver and transceiver design is that manufacturers are moving away from the up-conversion technique. The up-conversion design became popular around the same time that synthesizers and general coverage receive came along – in the 1980s.

In an up-conversion receiver, the incoming signal from the antenna is mixed with a variable VHF signal derived from the frequency synthesizer. Let's go through an example with the Kenwood TS-870. Suppose we have an incoming signal on 14.2 MHz, then the first local oscillator is on 87.25 MHz. The two signals are subtracted in the first mixer and the difference frequency – 73.05 MHz — is picked out by a tuned circuit. The signal is passed through a "roofing filter" – a crystal filter with a 15 kHz bandwidth intended to pass the broadest type of signal we are interested in (broadcast quality AM or narrow band FM). At the same time, the roofing filter rejects all signals outside its fairly wide passband, improving strong signal handling well away from the frequency of interest.



TS-870 receive frequency conversion scheme

The 1st IF signal on 73.05 MHz is mixed with a second local oscillator on 64.22 MHz to produce a second IF on the difference frequency of 8.83 MHz. At this frequency, it is possible to use multiple crystal or ceramic filters to match the bandwidth of the mode in use. For example — 3kHz, 6 kHz or 15 kHz.

The 2nd IF signal on 8.83 MHz is mixed with a third local oscillator on 8.375 kHz. This produces the third IF of 455 kHz and once again it is possible to use ceramic filters of 3 - 15 kHz bandwidth.

Finally, the third IF signal on 455 kHz is mixed with a fourth local oscillator on 467.8 kHz to produce a fourth IF around 11-12 kHz. This low frequency (near-audio) signal is converted from analog to digital format and subjected to digital signal processing. The DSP unit filters the incoming bandwidth, rejects unwanted heterodynes and demodulates the incoming signal.

The up-conversion technique makes it easy to reject image frequencies — the unwanted frequency that when applied to the first mixer would also produce a mixing product on the first IF. In our example, the image frequency that could mix with the 87.25 MHz LO to produce an IF signal on 73.05 MHz would be a high VHF frequency around 160 MHz. Such a frequency is easily filtered out by the inexpensive half-octave filters in the receiver front-end.

But there is a weak spot in this up-conversion design — the 73.05 MHz roofing filter. This 15 kHz wide filter does not provide any protection against signals close-in to the desired signal frequency of 14.2 MHz. As a result, strong signals within ± 7 kHz of 14.2 MHz can pass straight through the first IF and possibly cause overloading in the later mixers and IF stages.

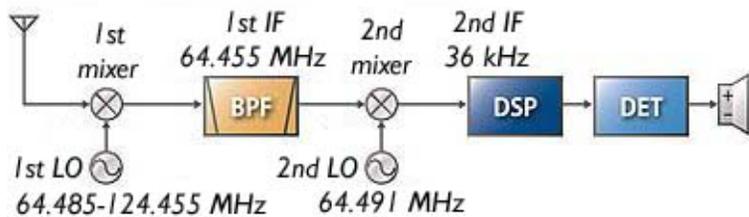
In a perfect world, we would select a roofing filter with a narrower bandwidth appropriate to the mode in use. This approach is taken in modern transceivers such as the Icom IC-7600. The first IF is at

64.455 MHz and the transceiver is supplied with three built-in roofing filters having bandwidths of 3 kHz, 6 kHz and 15 kHz. Icom claims that “the 3 kHz filter is especially effective in CW and SSB modes to eliminate overloading caused by strong signals just outside the passband.”



Icom IC-7600

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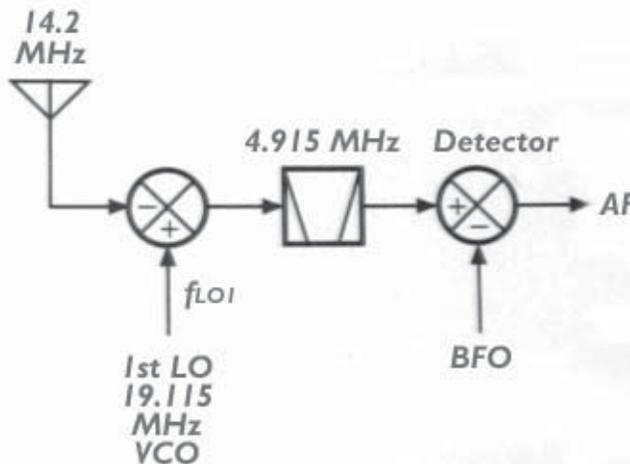


Icom IC-7600 receive frequency scheme.

But there are still problems with this approach. Narrow-band crystal filters operating at VHF frequencies are expensive (the IC-7600 price class is around \$4,000!) and the real bandwidth of these VHF filters may be wider than advertised. Doubts have also been expressed about long term stability of these filters. And even if you have a 3 kHz roofing filter, with a bandwidth exactly suited to SSB operation, you will find that on CW or RTTY you can still squeeze a lot of strong, interfering signals near your desired frequency through that 3 kHz bandwidth.

The solution chosen by some modern receivers and transceivers is to avoid the up-conversion stage altogether and instead use a frequency conversion scheme that is closer to classic radios of the 1970s, before the era of general coverage receive. In these radios, the incoming HF signal is mixed up or down to produce a first IF in the low HF range, around 5 to 9 MHz. At these frequencies, it is much easier to provide a crystal filter that matches the bandwidth of the mode in use.

For example, in the Elecraft K2 transceiver, the receive path is very simple. An incoming signal on 14.2 MHz is mixed with the first oscillator on 19.115 MHz to produce the first IF of 4.915 MHz. In the first (and only) IF, the crystal filter for CW has a variable bandwidth from 200 kHz to 2 kHz. For SSB, a fixed bandwidth filter is switched in. After more filtering at 4.915 MHz, the signal is detected without any further frequency changing.



Elecraft K2 transceiver has a straightforward frequency conversion scheme on receive.

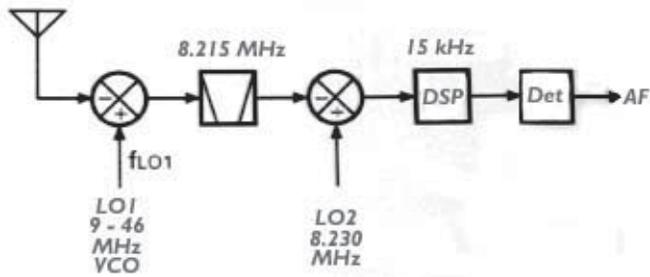
Elecraft’s latest transceiver, the K3, adds multiple crystal filters and DSP to this simple frequency design.

In the K3, the incoming HF signal is mixed with a local oscillator on 9 to 46 MHz for a first IF of 8.215 MHz. The K3 has space for up to five crystal filters, with optional bandwidths from 200 Hz to 6 kHz. These filters can accurately match the bandwidth of the mode in use, for example 200 Hz and 500 Hz filters can be used for CW and data, while 1.8 or 2.7 kHz can be used for SSB, CW and data. After further filtering, the first IF is mixed with a second local



Elecraft K3 transceiver

oscillator on 8.230 MHz to produce a second IF of 15 kHz, ready for digital signal processing and detection.



Elecraft K3 receive frequency conversion scheme

You might be wondering how much all these extra roofing-filters add to the performance of a receiver, and how much better the latest receivers are than your old boat anchor. An Internet site worth visiting is Sherwood Engineering's Receiver Test Data page, <http://www.sherweng.com/table.html>. There Rob Sherwood, NCOB shows the results of his own testing on many transceivers and receivers, right up to the latest models, listed in order of the receiver dynamic range at narrow (2 kHz) spacing.

Here are some selected figures from the Sherwood Engineering site for the radios just mentioned, plus some popular transceivers used around PCARA:

Radio	Dynamic range –	
	wide / narrow spacing	
	20 kHz	2 kHz
Elecraft K3	104 dB	101 dB
Elecraft K2	95 dB	80 dB
Icom IC-7600	100 dB	78 dB
Icom IC-706 MkIIIG	87 dB	74 dB
Kenwood TS-870S	95 dB	69 dB
Icom IC-7000	90 dB	63 dB
Kenwood TS-520	63 dB	63 dB

If you only operate SSB, the dynamic range at the wider spacing of 20 kHz is the first figure to check. But for narrow-band modes such as CW, RTTY and PSK-31, the narrow spacing dynamic range is more important.

Word has been leaking out about a new Yaesu transceiver, the FTdx5000 series. In a break from Yaesu tradition, the radio appears to use a similar frequency conversion scheme to the Elecraft K3. The first IF is at 9.000 MHz with a choice of crystal filter bandwidths of 300 Hz, 600 Hz, 3 kHz, 6 kHz or 15 kHz. The second IF in the main receiver is at 30 kHz. A fold-out brochure in January's *QST* claims a dynamic range of 105 dB at 2kHz spacing.

As a footnote, it has to be said that wide/narrow dynamic range is not the only parameter to check

when selecting a new or used transceiver. This property is only important when the bands are crowded with strong signals, for example during a busy contest, or during multi-station activities such as Field Day and Special Event operations.

Equally important are the ergonomics of a receiver. Are the often-used controls easy to reach, or are they buried under several layers of menu? (For example, keying speed and microphone gain are controls that really ought to be on the front panel.) Are the knobs and buttons just the right size, or too small for human fingers? How easy is it to change bands and change mode? Do you need to readjust the antenna tuning unit for every frequency change? How well can you adjust receiver bandwidth with optional filters, IF shift and DSP to isolate the desired signal and reject interference?

When you come across an HF transceiver that you can 'drive' as comfortably as a car, and that performs entirely to your satisfaction, then you may have come a little closer to ham heaven.

- NM9J

Amateur Radio Clubs make a difference!

When it comes to reaching radio amateurs there is no stronger link than to the hundreds of Amateur Radio clubs across the country. Now as the application period for ARRL Foundation Scholarships is open (until February 1, 2010), club newsletters and email bulletins to club members are an effective and important tool to remind young hams that there are more than 50 scholarships to be awarded in the spring of 2010.

If your club membership has high school seniors and adult hams pursuing continuing education, remind them that the application period for the 2010 scholarship awards closes promptly on February 1, 2010. All the information about ARRL Foundation Scholarships, including application instructions and forms, can be found on the web at <http://www.arrl.org/arrlf>.

Candidates should review the descriptions of all the scholarships and apply only those for which they qualify*. Note that a recent transcript is required with all applications.

Another vital role your club can play in the scholarship program is to encourage club members — and the club itself — to make contributions to the ARRL Foundation Scholarship Fund. Contributions in any amount to the ARRL Foundation are an important source of revenue to strengthen the scholarship program. New \$1000 scholarships are added every year

and your club might think about sponsoring one with an annual donation or by endowing an award with a larger gift.

*Note: The William R. Goldfarb Memorial Scholarship is open only to high school seniors who must complete the application for that award and include a FAFSA or SAR based on the most recent family financial information, along with a full high school transcript.

The ARRL Foundation is an IRS-designated 501(c)(3) organization holding tax id # 23-7325472. Contributions to the ARRL Foundation are tax-deductible to the full extent of the law.

Article credit: The ARRL *Club News* and The American Radio Relay League.

Radio Cortlandt TC

A few weeks ago, I was investigating interference to my HD Radio reception of WNYC on 93.9 MHz. I noticed that a new signal on an adjacent channel had joined the airwaves in the Peekskill/Cortlandt area — tune to 94.1 MHz FM and you may hear a strong signal there. At various times, it has been heard broadcasting programs in stereo from Sirius-XM including “80s on 8”, Howard Stern, and seasonal holiday music on a loop.

My first thought was that this was someone close to my home, using a Sirius or XM satellite radio receiver with its built-in FM modulator.

Further investigation revealed that this was no 250 microvolt per meter Part 15 transmitter. The signal could be heard on a car radio from my home near HVHC, all the way along Route 202 almost to the Taconic State Parkway. There was a similar pattern coming back along Route 6. Bob, N2CBH reported that the signal was strong along the Bear Mountain State Parkway to his place on Route 6. At the PCARA holiday dinner, Greg, KB2CQE and I found that signals were not reaching the restaurant at Annsville Circle, but they did come in clearly as soon as the Bear Mountain Parkway crests behind Jacobs Hill.

Direction finding from my own location suggested a bearing of NNE, on a line through the high spot on Rubbo Drive.

Wires, KC2FYY provided some valuable information when he reported that the signal on his IC-706 was strongest along the stretch of Route 6 between Lexington Avenue and the Bear Mountain State Parkway. (This reminded me of a 2007 foxhunt, when Sharon KC2LLC hid on Lakeland Avenue, just off Lexington Avenue, providing saturation level 2 meter signals all over the Cortlandt Town Center.)

I carried out some further investigation with my car radio antenna fully retracted into the door pillar.

Normally, the only signal I can hear under these car-wash conditions is WHUD’s 50 kW on 100.7 MHz. However, with the antenna down, the new signal on 94.1 could also be received, all the way from Best Buy to Mavis Discount Tire on Route 6.

I made a close-in check with the car radio tuned to 94.3 MHz, listening to sideband splatter from 94.1. Under these conditions, the strongest signal seems to be from the area where Westbrook Drive crosses Route 6, around Kohl’s and Home Depot. I also checked the area around Westbrook Drive, but the signal strength drops off further north from the main intersection with Route 6.



Signals on 94.1 MHz were strong in the area around Kohl’s and Home Depot.

At the time of writing, there the mystery lies for now! I would guess that somebody or something is running a reasonable amount of power — perhaps a few watts — into a resonant antenna in order to be heard over the substantial range of 1 – 1.5 miles.

To see what sort of equipment might be involved, I had a look on the Ramsey Electronics kit site where a range of inexpensive AM and FM transmitters can be



Ramsey FM100B FM radio station kit.

found — <http://www.ramseyelectronics.com/hk/default.asp?page=amfm>. The standard USA version of these kits is limited to a power output around 25 milliwatts and users are encouraged to stay within the FCC Part 15 rules to avoid interference. But it would not surprise me if the 1 watt export version of one of these TX kits or something similar was radiating Sirius-XM signals around the Cortlandt Town Center and beyond.

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

Sun Jan 3 2010: PCARA Annual Bring and Buy Auction, Hudson Valley Hospital Center, 3:00 p.m.

Hamfests

Sun Jan 10: Ham Radio University 2010, Levittown Hall, Briarcliffe College, 1055 Stewart Ave, Bethpage, NY. 7:30 a.m.

Sun Feb 28: LIMARC Indoor Hamfest, Levittown Hall, Hicksville, NY. 9:00 a.m.

VE Test Sessions

Jan 3: Yonkers ARC, Yonkers PD, 1st Precinct, E Grassy Sprn Rd, 8:30 a.m. Contact D. Calabrese, (914) 667-0587.

Jan 15: Bergen ARA, Westwood Regional HS, 701 Ridgewood Rd, Washington Township, NJ. 7:00 p.m. Contact Donald Younger, 201 265-6583.

Jan 25: Columbia Univ VE Team, 2960 Broadway, 115 Havemeyer Hall, New York NY. 6:30 p.m. Contact Alan Croswell, (212) 854-3754.

Jan 29: Orange County ARC, Munger Cottage Riverlight Park, Hudson St., Cornwall NY. 6:00 p.m. Contact Ronald Torpey, 845 234-2371.



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