



PCARA Update



Volume 7, Issue 12

Peekskill / Cortlandt Amateur Radio Association Inc.

December 2006

Visions of sugar-plums

With 2006 quickly winding down, there's not much remaining on the PCARA calendar. The Annual



Holiday Dinner is Sunday December 3, 2006 at *At The Reef* on Annsville Circle. If you've decided at the last minute that you'd like to attend, the cost is \$25 and please let Ray, W2CH know **ASAP** by emailing him at w2ch 'at' arrl.net.

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

- 73 de Greg, KB2CQE



Karl N2KZ (left) and Greg, KB2CQE give their red-nosed reindeer impressions at last month's PCARA meeting.

Net night

Don't forget that the PCARA weekly net now takes place on **Wednesday** evenings at 8:00 p.m. You can call in to the net on the 2 meter repeater, 146.67 MHz, offset -0.6 MHz, 156.7Hz CTCSS.



Will the jolly old elf bring you a radio gift?

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PCARA Officers

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Greg Appleyard, KB2CQE kb2cqe at arrl.net

Vice President:

Joe Calabrese, WA2MCR; wa2mcr at arrl.net

Secretary/Treasurer: *open.*

Adventures in DXing

– N2KZ

Remember, It's December!

Christmas is not the only thing to look forward to this December! Keep your ears open a week or two before the big day on 6 meters. E-skip conditions should be appearing regularly during the yearly second-



Karl has been using this Yaesu FT-690R II transceiver on 6 meters.

ary peak of this band. Never underestimate the magic band even during the bottom of the sunspot cycle! This summer brought remarkable VHF DX to this QRPP CW fan from all over North America. If I can work dozens of stations with one watt, just imagine where your signals may be heard! Tune in every few hours to see if anything is cooking around 50 MHz. Another great indicator can be found watching over-the-air television channels 2 through 6. Connect a rabbit ear antenna to your TV. When you see second images, or large black bars beating with local signals, six meters should be



"I'm dreaming of a new Yagi..."

skip. I'm dreaming of a new Yagi...

Should old acquaintance be forgot, and never brought to mind? End the year remembering the past. Straight Key Night begins at 7 p.m. on New Year's Eve and continues for 24 hours until 7 p.m. New Year's Day. Hundreds of CW operators nationwide will be sending code carefully with seasoned fists using nothing more than brass and rhythm. Instead of sending "RST" signal

reports, you'll hear their distinctive signature of "UR SKN 599" to mark the day. Unlike any other contest, long duration rag chews are encouraged! In recent years, Straight Key Night has become an on-air reunion of old gear along with old keys. You'll hear lots of



Bring out your old keys for Straight Key Night.

Heathkit, E.F.Johnson, Hallicrafters and Knight-Kits on the air along with homebrewed thermionic gear. The ARRL sponsors the event and encourages participants to send in their logs and vote for best fist heard and best QSO. It's a great opportunity to send slow and easy code. Start your new year with new acquaintance and delight!

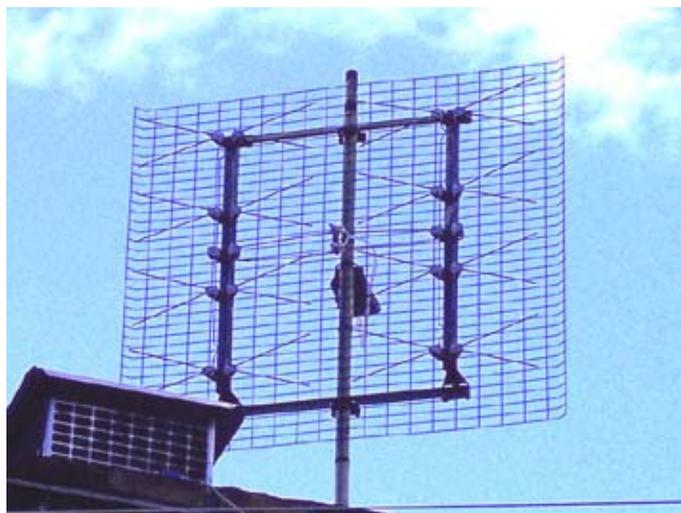
UHF HDTV For Me?

Over-the-air native HDTV can be a struggle to receive. I am about to begin my third year as a HDTV early adopter. Although the prospects for consistent reception from New York City have vastly improved, it still does not reach the old-fashioned standard of reliability we are accustomed to with analog NTSC. One source of anxiety: fringe area reception using one antenna without a rotor. I can not seem to find a single antenna bearing that will provide continual reception of "local" television. Using an 8-bay bowtie antenna with a pre-amp, the directionality is simply too tight for overall general use. I just can't find a "set it and forget it" compromise.

I have given this dilemma considerable thought. Could it be the lack of linearity in the antenna's gain across a broad bandwidth? Could I be suffering from irregular changes in propagation from channel to channel? Are the transmitters too far apart from each other to make a unified beam towards my area? There are still a couple of channels (NBC 28 and PBS 61) that are not operating at full power. Is my antenna's beam width so narrow that it is not forgiving? I actually obtain more consistent reception of DTV using a 40 year old Lafayette log periodic antenna in my garage attic than my 8-bay bow tie. It has a handful of elements for UHF providing a much broader "nose" than my 8-bay bowtie array. The 8-bay is wonderful at capturing single weak signals from places as far away as Albany, Hartford and Wilkes-Barre/Scranton, but the log periodic can't be beat for overall consistency.

I have one question for the broadcast industry: I have been a broadcast engineer for nearly 40 years and

study every aspect of HDTV. I also work with HDTV system design and configuration in a professional setting daily. If I am having trouble pulling in over-the-air HDTV signals, how is the general public supposed to embrace it as an equivalent medium for analog TV?



Karl's 8-bay bowtie array for UHF TV.

Broadcast HDTV has been on the air nearly ten years, yet so little is known about it. I regularly have friends and neighbors ask me about HDTV antennas. They are amazed that old TV antennas or even rabbit ears can pull in these high-tech signals. I can spend an afternoon setting up a wide screen display and teaching its owner about its use. I always expect several follow-up questions during the following weeks! How I wish broadcasters would reach out and educate the public about new technologies. What a wonderful world it would be!

Election Night Results

It was fascinating watching television coverage of the 2006 elections. ABC and NBC both made attempts to utilize widescreen presentation of results. ABC took their 4 by 3 standard definition frame and justified it left in their widescreen 16 by 9 image. This allowed



WABC-HD used a right side panel to show additional results on Election Night.

them to present additional election results in a single side panel along the right side of the HDTV screen. The graphics of the right side panel imagery were dramatically sharper than the live SD programming on the left. NBC was quizzical. The nationwide results with Brian Williams were presented in 4 by 3 format in standard definition with black side panels left and right to fill the widescreen perspective. Local results, produced by WNBC-TV, were razor sharp in spectacular full 16 by 9 HDTV. The difference between the network and local feeds was night and day. CBS presented non-stop local and nationwide results with their signature gray side panels. During the last couple of weeks, CBS has discontinued airing their gray side panels reverting to black panels used by most of the industry.

Even Sharper

Sony's new Playstation 3 has it. Some networks are experimenting with it. Film makers use nothing else. It's called 1080p, and it is the ultimate in HDTV. It's not likely that you will see it over-the-air. It requires more spectrum space than a standard 6 MHz channel can offer, at least for now. If you have witnessed digital projection in a movie theatre, you have seen 1080p. Add to this soup a new technology called wobulation, developed by Hewlett Packard, originally designed to increase the resolution of inkjet printers. Read about it at: http://www.hp.com/hpinfo/newsroom/feature_stories/2005/05wobulation.html. Wobulation greatly reduces harsh edges of tiny little boxy pixels found in a digital presentation to create a much more natural and appealing look. This combination of technologies will lead us into the next level of HDTV. Experiencing full 1080p at 60 frames per second is like stepping into the next dimension. It's better than actually being there!

Under Construction

Two projects are nearly completed in the N2KZ ham shack. I have been slowly building a Small Wonder Labs Hi-Mite, a 250 milliwatt transceiver, for 20 meters. The kit has been more of a challenge since it did not include a pre-drilled chassis and a handful of parts. Some basic modifications were necessary like an audio and RF gain control. I'm only a couple of hours from testing this unit. A review will follow soon!

I have also inherited a ten year old transceiver for 80 meters. It is a four watt TAC1 QRP CW kit designed for S & S Engineering. I have only experienced a couple of QSOs with it. It seems to work quite well with extraordinary audio filtering reminiscent of my military surplus R390A. The precise tuning and useful filtering of the TAC1 were quite a revelation. It has inspired me to consider buying a "real rig" like a Icom IC706 MKIIG. I know that this aspect of operation is probably second nature to most readers of this column, but it is a

revelation to me. I have only used vintage gear or QRP kits during my seven year career as an amateur. Most all of them have continuous analog tuning requiring



S&S Engineering TAC1 transceiver for 80 meters

guesswork when trying to decide your current frequency. Maybe it's time to break through to the world of digital technology!

Dual Identity

N2KZ is not just an amateur radio callsign! It is the new identifier of a Hawker Raytheon 700A corporate jet based in California. I have to admit I am surprised to see that the FAA assigned my callsign as an identifier of a corporate jet. Built in 1982, it features a new leather and burlwood interior, sculpted carpeting, Bose headsets and all Collins avionics and communications systems. It is on sale now for an undisclosed price. If you have to ask, you can't afford it! A perfect holiday addition to any ham shack!



This Hawker/Raytheon 700A corporate jet bears Karl's callsign "N2KZ" as its tail number!

Happy Holidays

XM Satellite Radio is expanding their celebration of the holiday season. Beyond the five channels of Christmas music available, starting December 15 you'll hear Radio Hannukah on XM channel 108. XM has revealed very little about the content of this channel. I will be interested to see what programming will be included. Happy holidays to all!

Until next month, may your days be merry and bright!

– 73 de N2KZ “The Old Goat”



Holiday Dinner

PCARA's annual holiday dinner will take place at 3:00 p.m. on Sunday December 3 At *The Reef* restaurant. Ray W2CH and Marylyn KC2NKU have once more taken care of the arrangements and provide the following menu choices.

MENU

Tossed green salad

Choice of entrées:

Prime Ribs of Beef

Chicken Cordon Bleu

Boneless Breast of Chicken Marsala

Broiled Stuffed Filet of Sole

Broiled Filet of Salmon

All entrées include: Baked Potato, Vegetable, Coffee, Tea and Cake of the Day.

Final total is \$25.00 per person, not including drinks. If you would like to attend the PCARA Holiday Dinner, please contact Ray, W2CH, e-mail: W2CH 'at' arrl.net.



"At the Reef" restaurant on a snowy Sunday in December 2005. The location is on Route 9 at Annsville Circle, at the junction of Routes 6, 9 and 202 in Cortlandt Manor.

Radio Frequencies in the Classroom - KB2ZYU

This past summer I had the pleasure of attending the 2006 ARRL Teachers Institute in Newark, New Jersey. Many of us have read about the program in the pages of QST and have gotten curious about the content and the purpose of the course. As a teacher at a private Catholic school in Ossining, I applied and was accepted. It's open to hams and non-hams alike. Mark



ARRL Education and Technology Program Coordinator Mark Spencer, WA8SME

Spencer, WA8SME, the program's coordinator and author of most of its content hails from California and brought with him a great selection of educational materials ranging from textbooks on basic electronics and RF technology to circuit boards and even robots! All of the materials were given to each student to keep. The cost of the week's class work was nothing; even expenses such as meals and rooms were paid. There were ten of us in class, most from the New York metropolitan area. Two

attendees were from out-of-town: Don Oakjones, WB3KUH from Baltimore and Ken Brown, N8LZN who flew in from Columbus, Ohio.

The week began with a demonstration of basic electro-magnetic properties and some chalk-and-talk discussion centered on electricity, radio frequency theory and applications. (Chalk-and-talk is teacher lingo for "at the blackboard!") All of Mark's demonstrations and lessons were geared toward application in a middle- or high-school setting. For example, try dropping a strong alnico magnet down a length of copper pipe...any length will do. Even though the magnet will not attach itself to the copper pipe, its descent inside the pipe is very slow due to eddy currents and the Faraday Principle. Thus began our study of basic electro-magnetism. I've used this demo in my class already and with great success!

From there, the class continued day-by-day through studies of weather satellites, circuit building and ham radio. The pace was a bit frenetic since there was so much to cover in so little time. But the purpose of the course is to give students (we teachers, that is) an overview of how RF can be incorporated into a school curriculum spanning all academic subjects and not just science. Mark's demo of capturing a weather satellite's signal as it passed overhead one afternoon was a great success. Using only an HT, a home-brew directional antenna made from twin lead and PVC piping and a lap-top computer, we set up outside of the old New Jersey Terminals (the temporary home of the

Liberty Science Center which is undergoing renovations) and captured and displayed the weather data right there on the computer screen to the enjoyment of all, including passers-by who were naturally curious. Our equipment display even piqued the curiosity of the local park rangers who needed to know if we were doing anything clandestine! Thus begins a lesson in Social Studies! Mark's syllabus was continually seeking to span the school curriculum with the view of getting kids involved in radio communication in all its various modes and methods.

A very neat application was the introduction of the Optoscope, a PC driven oscilloscope with which we studied the digital signals generated by the lowly TV Remote. The "pickle" as some call it has become indispensable in the living room as long as it doesn't become lost in the sofa cushions! But what, exactly is going on between the remote and the television? It's something that few of us (and certainly none of my students) ever think about...we just assume that the thing will work. In looking inside, however you can gain insights into the thought that went into its design and perhaps come up with a few new applications of your own! That's the whole thrust of the program: The Future of RF Technology. The week ended with a simply fantastic workshop centered on EPROMS and robotics. Each of us was given a programmable robot made in kit form by a company in California and taught how to build it, wire it and program it to avoid objects, follow a described path, and follow other robots, elephant-walk style! The kids love it; the grownups, too!

From an amateur radio point-of-view, licensing, propagation, civil service and DXing were all discussed. Mark even brought with him a box load of QSL cards, some unclaimed from the bureaus, some old and undated (!) and all up for grabs...this single aspect of amateur radio activity has always fascinated me and provides more lessons in Social Studies! Morse Code, of course was introduced to those unfamiliar with the language (there's one for English Language Arts) and a smattering of math as it applies to wavelength and antenna construction was studied. There certainly was something for everyone.

The week ended with best wishes and cheers all around. Our small class had gotten to share lesson plans and ideas and I even made a couple of new friends along the way. I plan to incorporate more projects and applications into my lesson planning as the school year progresses. I also hope to apply for an equipment grant from the Teachers Institute toward the purchase of a weather satellite receiver. Who knows, perhaps in the future my classroom might even boast a club call sign. The Sky's Not The Limit!

- 73, Ed KB2ZYU



High Deaf radio?

HD Radio has been around for four years. In October 2002, WOR – 710 kHz became the first AM station in New York to use iBiquity’s IBOC (In Band-On Channel) digital broadcasting system, while in November, 2002, Detroit’s WDMK-FM, then on 102.7 MHz was the first commercial station to broadcast HD.

Unfortunately, suitable receivers for digital radio have been hard to come by. Kenwood brought out an expensive car radio in HD’s early days, and in 2004, Boston Acoustics introduced their “Receptor Radio™ HD”. Performance reviews were not terribly good for this table radio and the \$500 initial price put it out of reach for most. The “Receptor HD” has since dropped to \$300, but it still looks expensive for such a small box.

In October, Radio Shack introduced its “Accurian HD Radio” part number 12-1686 at \$200. Ibiquty threw in a \$25-\$50 mail-in rebate on various HD Radio models, reducing the price to \$175. Then on “Black Friday”, Nov 24, Radio Shack dropped the pre-rebate price to \$125 for two days. The local store had just one in stock, and – as I had some particular requirements in mind – their demo model came home with me.



Accurian HD table radio with remote control

Funny Modulation: I tried the new receiver on my outdoor 9-element FM yagi antenna and performance seemed quite good. Some 15 New York FM stations were broadcasting “HD” at the time I checked. My main rationale for purchasing the Accurian was to pick up PBS’s *All Things Considered* on Sunday evenings. This popular program has been banished from WNYC-FM on 93.9 MHz to 820 kHz AM. At my location, reception of WNYC’s AM transmitter is practically impossible in the evening. But on the Accurian, WNYC on 93.9 MHz now provides three digital program streams: “93.9-1” (HD1 stream, same as FM analog),

93.9-2 (24 hour music) and 93.9-3 (same as 820 kHz AM stream)... so at least I achieved my objective. In hybrid mode, FM HD radio provides 96 kbps for the audio channels. NPR tests have shown this is sufficient for two near-CD quality channels, plus up to four additional voice-grade channels, with minimal interference to analog radios.

VHF HD Radio – as received in Cortlandt Manor

| Freq MHz | Call | HD1 | HD2 | HD3 | PAD (prog data) |
|----------|------|------|------------|--------|-----------------|
| 90.7 | WFUV | Yes | As HD1 | | |
| 92.7 | WCAA | Yes | Stereo | | |
| 93.9 | WNYC | Yes | Music | AM 820 | |
| 95.5 | WPLJ | Yes | Oldies | | Yes |
| 97.1 | WQHT | Yes | Stereo | | |
| 98.7 | WRKS | Yes | Stereo | | |
| 100.3 | WHTZ | Yes | Stereo | | |
| 101.1 | WCBS | Jack | Oldies | | Yes |
| 102.7 | WNEW | Yes | WINS 1010 | | Yes |
| 103.5 | WKTU | Yes | NY Country | | |
| 103.9 | WFAS | Yes | | | |
| 104.3 | WAXQ | Yes | Oldies | | Yes |
| 105.1 | WWPR | Yes | Pwr Latino | | Yes |
| 105.9 | WCAA | Yes | Stereo | | |
| 106.7 | WLTW | Yes | Oldies | | Yes |

The Accurian’s ergonomics have been reasonably well thought out – with just seven press buttons, volume control and power on/off switch. In order to feed the audio output to my Hi-Fi equipment, I had to use the headphone socket. When not using the stereo, I like to cut all power at the power strip — and if the Accurian is plugged in to the same strip, there are three problems when the strip is turned back on. First, the receiver has to be powered up manually; second its clock has to be reset... and third, its subsequent frequency can be rather unpredictable. The radio does include a clock, but rather oddly, there is no way to use it as a clock-radio, turning on at a specific time.

I suspect that the Accurian is really a car radio hiding in a table radio box. The clues are – it runs off 12 volts DC, it forgets what it was doing when the 12 volt supply is removed, and it does not have any alarm function. On AM, the selectivity seems to vary according to signal strength – also a characteristic of car radios. I found the way to make the Accurian remember its last frequency is to switch off using the “Power” button, rather than just pulling the plug.

Under the right circumstances, reception quality can be very good. For the first few seconds of tuning to an HD station, the Accurian displays the call sign and delivers the FM-analog audio. After buffering the HD digital data for 8 seconds or so, the receiver switches over from the analog stream to the first digital program stream (“HD1”), which is usually carrying the same program material as FM-analog.

Buffering of the incoming data is essential to allow the HD radio time to carry out error correction and decompression. In order for a smooth transition, as the HD receiver blends from analog to digital signal and back again, HD broadcasters now have to arrange a delay on their analog signal of 8 seconds. This could be in addition to any existing profanity delay required for call-in programs. Without the analog delay, the HD receiver's output from the digital signal would be running several seconds behind the analog signal.

After the Accurian receiver has buffered sufficient data and switches over from analog to digital reception, there can be a noticeable change in quality — perhaps due to different amounts of audio compression and/or equalization by the broadcaster.

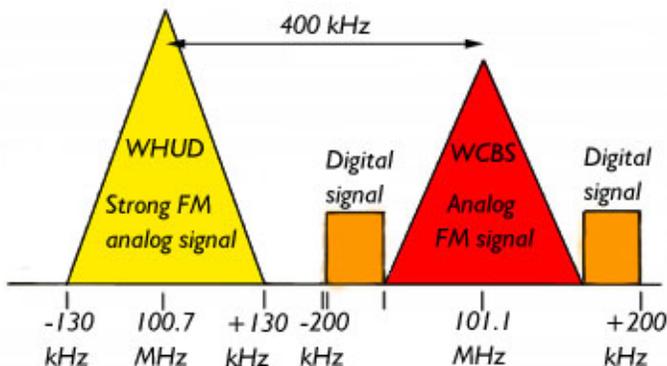
Changing from my external antenna to the Accurian's supplied wire dipole was a big disappointment... Only *one* HD station was evident, 90.7 WFUV. WFUV became a *very* strong signal in my location, after its antenna was moved to a 28-story apartment building in the Bronx, where WFUV runs 46 kW ERP. (There is also a 2.5 kW on-channel booster, located at the steeple of Riverside Church in upper Manhattan.)

Another possible reason for purchasing an HD radio might be to pick up the WCBS oldies station that was elbowed out by Jack FM on 101.1 MHz. The oldies DJs may be gone, but the music lives on through WCBS' HD2 stream.



Accurian display while picking up the HD2 stream from WCBS-FM

Unfortunately, reception of WCBS in digital HD can be very doubtful in our area, thanks to the proximity of the overpowering WHUD on 100.7 MHz, a mere 400 kHz away. The digital sidebands of Ibiquity's HD format stretch from 131 to 200 kHz on either side of the carrier. This makes the sidebands very vulnerable to



Digital sidebands of an HD radio signal can be affected by a strong signal on an adjacent channel, 400 kHz away.

interference from strong stations on the adjacent channel, (not to mention their vulnerability to noise).

When two FM stations only 400 kHz apart are *both* broadcasting HD digital signals, the problem becomes more severe. If one station is only a little stronger than the other, interference will occur. In practice, HD digital stations must be spaced 800 kHz apart for interference-free operation.

Ancient Modulation: If you thought things were bad on 88-108 MHz FM, it gets worse on AM. The Accurian HD receiver includes a loop antenna for AM, and when I tried mine it was capable of receiving just four HD stations in the New York market.

| AM HD signals | |
|---------------|------|
| Frequency | Call |
| 660 kHz | WFAN |
| 710 kHz | WOR |
| 770 kHz | WABC |
| 880 kHz | WCBS |

AM signals need to be *very* strong before HD reception is possible. Once the Accurian finds a digital AM signal, the callsign appears on the display, then after buffering data for 8 seconds or so, the receiver switches from analog to digital reception, just as with FM. There is *some* improvement in high frequency response with the change to digital – but this is only partly due to new technology. Broadcasters have been deliberately limiting AM analog audio bandwidth to 5 kHz, to make room for their digital sidebands. Since much of AM broadcast radio is dedicated to news and call-in programs with limited audio bandwidth, the improvement offered by digital reception can be marginal – especially when the reporter is calling in from a scratchy cell-phone. Only 36 kbps is available for the digital stereo audio signal... which is not much.

Ibiquity's AM HD signal occupies a total of 30 kHz of radio bandwidth. This might be acceptable during daytime, but at night, those sizzling noises in the two adjacent channels cause too much interference, so HD is currently only allowed to operate during daylight.

So let's see – AM HD-radio needs a very strong AM signal, it gives only a marginal improvement in quality, and just at the time when you need it – at night – the digital signal has to be switched off. There is no room for any additional "HD2" program stream – and the system squirts digital noise over its analog neighbors. Just about the only improvement is the display of station callsign and program content labeling. This does not sound like a formula for success to me.

On the other hand, VHF-FM HD Radio gives additional HD2, HD3 channels and stays available 24 hours a day. My guess is that AM-HD radio will fade away, but FM-HD stands a chance against satellite radio, podcasts and Internet broadcasting. – NM9J

Peekskill / Cortlandt Amateur Radio Association

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

E-Mail: w2nyw@arrl.net

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

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 Dec 3: December meeting/holiday dinner, 3:00 p.m. "At the Reef" restaurant.

Hamfests

Sat Jan 27 2007: NLI Section Convention/Ham Radio University, Briarcliffe College, 1055 Stewart Avenue, Bethpage NY.

VE Test Sessions

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

Dec 7: WECA, Westchester Cnty Fire Trng Center, 2 Dana Rd, Valhalla, NY. 7:00 p.m. Contact Stanley Rothman (914) 831-3258.

Dec 11: Split Rock ARA, Hopatcong HS, Hopatcong, NJ. 7:00 p.m. Contact Sid Markowitz, (973) 663-0518.

Dec 18: Columbia Univ ARC, 612 W 115th St, Columbia Univ-Morningside Hgts, Watson Labs, 6th floor, New York, NY. 6:30 PM. Contact: Alan Crosswell, (212) 854-3754.



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PO Box 146
Crompond, NY 10517