PCARA Update

Volume 18, Issue 9 Peekskill/Cortlandt Amateur Radio Association Inc. September 2017

Flying into fall

Although we didn't have monthly meetings in July and August, it didn't mean we weren't busy doing things! PCARA Breakfasts were held at Turco's in Yorktown Heights on July 8th and August 5th (**very** well attended), the weekly Old Goats Net continued on Thursday evenings at 8:00 p.m. on the 146.670 MHz repeater, and PCARA members attended the Sussex County Amateur Radio Club Hamfest on July 16, 2017. A major door prize winner was your very own *PCARA Update* editor Malcolm NM9J. Malcolm walked away with a brand new Connect Systems CS580 DMR/FM HT from KB Cubed (http://www.kbcubed.com/). Congratulations Malcolm!

Okay. Please fasten your seat belts and return your tray tables to their upright positions! We have plenty of activities ahead for September and October, and they are as follows:

- **Saturday September 9:** Colonial Fair presented by Van Cortlandtville Historical Society and Old Saint Peter's Church Committee for Restoration, celebrating 250 years of Old Saint Peter's Church. PCARA will be operating a **Special Event Station** (call W2NYW) organized by David K2WPM as well as providing assistance with parking. Hours are 12:00 p.m. to 5:00 p.m. at Old Saint Peter's Church and Little Red Schoolhouse, at the intersection of Locust Avenue and Oregon Road in Cortlandt Manor, NY. For more information, please visit: http://www.vancort.net/Events.html. *(And see p. 13. –Ed.)*

Mike N2EAB and Greg KB2CQE check out a mobile transceiver at the Sussex County ARC Hamfest on July 16.

- **Saturday September 16:** 9:00 a.m. – **PCARA Breakfast** at Turco's in Yorktown Heights, NY.
- **Saturday September 16:** 2:00 p.m. – **Foxhunt University.** Planned location is subject to School District approval, so check nets and PCARA's Facebook page nearer the date. Class conducted by Karl N2KZ. Please bring your Foxhunting equipment.
- **Saturday September 23: PCARA Foxhunt**. Registration at 2:30 p.m. at the Beach Shopping Center, Dayton Lane, Peekskill, NY. Foxhunt will be from 3:00 to 4:30 p.m.

- **September 23 - 24: Maker Faire** New York, New York Hall of Science in Corona, NY. Maybe we could arrange a PCARA group trip. For more information please visit: http://makerfaire.com/new-york/.
- **Sunday October 1:** Mount Beacon Amateur Radio Club (MBARC) **Fallfest** Hamfest, Fishkill, NY. Please visit: http://wr2abb.org/home/ for details.
- **Saturday October 7:** Bergen Amateur Radio Association (BARA) **Hamfest** at Westwood High School in the Township of Washington, Bergen County, New Jersey. More details at: https://www.bara.org/hamfest/.
- **Sunday October 15:** 37th Annual Memorial Harry Chapin **Run/Walk Against Hunger** in Croton-on-Hudson, NY. PCARA will be providing communications support and we'll need members to help cover the courses. If you're interested in helping please let us know at: mail'at'pcara.org. We will be discussing details at the September and October meetings. For more information on the Harry Chapin Memorial Walk/Run Against Hunger, visit: http://www.runagainsthunger.com/.

Our next regularly scheduled meeting is **Sunday September 10, 2017** at 3:00 p.m. at New York-Presbyterian/Hudson Valley Hospital in Cortlandt Manor, NY. I look forward to seeing each of you there.

- 73 de Greg, KB2CQE

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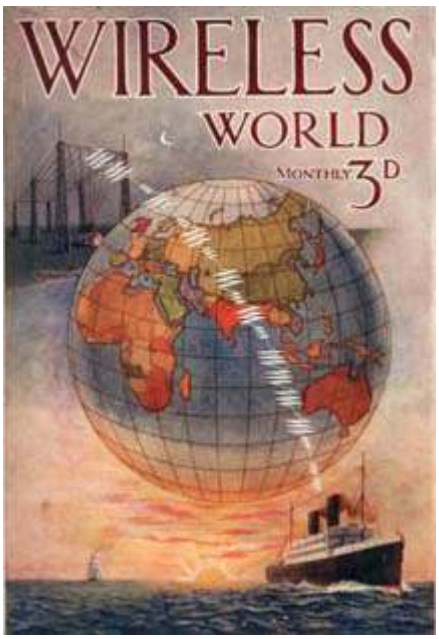
Sky News broadcasts to the world on cable, satellite and Internet from studios in west London.

Wireless world

I admit it. I don't listen to broadcast radio much anymore. Modern technology now allows on-demand listening and viewing. No longer do we need to wait for specific broadcast times or suffer through interference to hear a program we like. Touch your phone or tap a mouse and it all arrives in perfect quality instantly. We truly have entered into a new age of **wireless** distribution. How convenient it is!



(Can you copy the message from this cover of Wireless World, Sept 1913?)

Subscribing to this **new world** is effortless. I create a list of podcasts that I enjoy and they automatically load onto my devices as they are published. I can mow my lawn for three hours and listen to a parade of content I enjoy, seamlessly played without interruption or intervention. Often, these programs have little advertising and certainly don't suffer from the clutter heard on broadcast radio. The world of listening is now so much better.

Karl's podcast list includes 'On The Media', from New York Public Radio station WNYC.

I have even broken a decades old habit of watching the clock to hear hourly newscasts. Using the CBS News Radio app or TuneIn, I can hear a multiplicity of newscasts and commentary literally from around the world. How miraculous to watch Sky News live from Britain anywhere I go.

No longer do I feel remorse tuning in at five minutes after the hour knowing that the hourly newscast has passed by. I can recall it instantly and listen to my heart's content. Listening on-line also gives me access to the second part of the hourly newscasts from CBS. Most stations opt out after the first three minutes of the five minute newscast. The CBS webcast plays it all. My car radio automatically records the last twenty minutes of what I have been hearing so I can recall a moment I might have missed. Just rewind and replay!

The concept of live radio and television still has a handhold or two left. Sports coverage will always be live. Breaking news will always be live. You don't have to be home to watch. Not only can you take it with you, you can also replay it on demand as you wish. Very convenient!

Thinking like a capitalist, what is the business model for this new world? Analog dollars have turned into digital dimes (or even pennies) as audiences dwindle. There is no longer a captive audience where only a handful of stations serve a community. Now thousands of choices await your attention. How can you continue to profit from a broadcast business with a fractionalized audience?

On-demand programming is actually a savior for commercial broadcasters everywhere. Consider how inefficient and clumsy continuous networks or local stations can be. The chances of hearing or seeing one of your favorite shows is improbable at best. Also, remind yourself how much money and how many human beings are necessary to keep the music playing.

With on-demand, the cost of doing business plummets. There are no transmitters to power and maintain. Broadcast technicians and programmers can be reduced significantly. Without being on the air, broadcast regulations can be circumvented, too. No longer will stations be looking for time-killer infomercials or barter advertising trying to eke out some income during hours with minimal audiences.

On-demand maximizes profits and enhances audience convenience and numbers. So many more people

can enjoy a program when they can watch or listen at any time. Nielsen ratings now evaluate 'Live plus three days' or 'Live plus seven days' cumulative audiences. High tech analysis now meters the amount of Tweets or shares a show achieves. It really is a whole new world.

Predictably, we are also witnessing the obsolescence of televisions and radios as individual devices.

Smart phones have absorbed many of our modern devices.

My personal unscientific and casual poll tells me that most people under thirty think of TV sets and radio receivers as being contemporary as dinosaurs roaming the Earth. Cell phones alone have absorbed dial-up telephones, Instamatic and Brownie cameras, video recorders, calculators, calendars, newspapers (remember those?) notepads and radios and TVs and more!

Of course, there are elderly naysayers who will warn us to be wary of all of these newfangled devices and methods waving their sticks high in the air! "What will happen if the Internet collapses?" "What will happen if electric power fails and we can't charge our devices?"

Our complete independence from regional power grids may happen in our lifetimes. Some people are off-grid already by self-generating with wind or solar power. Our energy efficiency continues to improve. As for the Internet someday being halted or commandeered by rogues... it is probably inevitable and could be catastrophic. Historians will never forget that moment. Change the channel! I don't want to think about it.

In the meantime, take advantage of all the resources at your command. Use the TuneIn, iHeart and Radio.com apps. TuneIn alone provides more than any shortwave radio. Learn about all that YouTube has to offer. There are multitudes of television streaming apps, as well. Welcome to the 21st century! An exciting world is waiting for you! How will it all work out? Stay tuned!

Hounds Abound!

Join us at 2:00 p.m. on Saturday, September 16, 2017 for the PCARA's first Fox Hunt University! Malcolm, NM9J and myself will be holding a brief clinic and practice foxhunt. You will leave as an experienced and trained fox-hunting hound, all ready for our Fall foxhunt the next Saturday! Location details will be released shortly. Check the PCARA Facebook page or tune to 146.67 MHz to our weekly Old Goats Net on Thursdays at 8:00 p.m. for the latest news.

Please bring any and all gear you might be using during the hunt. You will need a transceiver or scanner that can receive 146.565 MHz. You'll also need a directional antenna for two meters (think three element Yagi,) a short length of cable to connect the antenna to your HT and possibly an attenuator to lessen very strong signals. If you don't have all the parts and pieces, bring along what you have and we will work with you! Any questions about gear? Take a look at the July 2017 edition of our *PCARA Update* newsletter for a detailed primer on fox hunting. More questions? Drop me an e-mail at N2KZ'at'arrl.net!

Lovji N2CKD and David KD2EVI wave their tape measure Yagis high in the air during a previous PCARA Foxhunt.

Part one of the class will be a workshop to assess your equipment and suggest what you can do before the big fox hunt the following Saturday. We will work with you so that you will be prepared to hunt! Part two will be a practical tutorial demonstrating how to peak and null signals and many other tips to increase your success. Finally, Malcolm will disappear into the park and all of us will try to find him en masse! I will be with you as you hunt to guide you to the fox. A grand time is guaranteed for all!

You do not need to be a licensed amateur to join us! This is a receive-only event. If you are interested in amateur radio or scanning, this free class might be a breakthrough experience for you! Try it out! Also, if you have no equipment or no familiarity with fox hunting, that is more than OK too! We are here to help. Fox Hunt University will make you wise and worthy!

Until next month, 73s and dit dit de N2KZ 'The Old Goat'

Yaesu FT-70DR review

The main handi-talkie in the NM9J shack was getting old. The Icom IC-W32A transceiver that I purchased in **2003** came from *Ham Central* in Poughkeepsie — remember them? This radio was originally introduced in *1996* with optional CSW32 cloning software available on **floppy disk**, for use with **MS-DOS**. Remember those relics? It was time to look around for something more modern.

An old friend — the Icom IC-W32A handi-talkie.

Replacing perfection?

The IC-W32A was a dual-band FM transceiver that fitted my requirements rather well. It had separate volume and frequency controls for each band, capable of monitoring two frequencies simultaneously on the "left-side" and "right-side" of the radio display. I was hoping to purchase a similar dual-band **dual-watch** radio from one of the big three manufacturers — but I came away disappointed.

Icom, Kenwood and Yaesu all have dual-band dual-watch radios in their current ranges. The model numbers are: Icom ID-51A Plus2, Kenwood TH-D74A and Yaesu FT2DR. All three have analog FM *plus* digital voice capabilities — D-Star® from Icom or Kenwood and C4FM-System Fusion from Yaesu. But Kenwood's backlit color screen and Yaesu's touch-screen are **not** to my liking. And street prices are **high**, ranging from $430.00 for the FT2DR to $600.00 for the TH-D74A. That's a lot of money to pay for a small radio that might be dropped in a puddle or left behind on a picnic table.

Yaesu FT2DR dual-watch HT has a touch-screen.

Watching the market

I followed advice from Bob N2CBH who points out that modern dual-band radios receiving one band at a time can be *almost* as versatile as their dual-watch counterparts — provided you set up fast scanning for your channels of interest.

I had been keeping an eye on available models, including Bob's recommended Icom IC-T70A, plus the recent Yaesu FT-65R — which appears to be Yaesu's economy HT, made in China. Then in mid-July I saw that Yaesu had begun supplying their brand new **FT-70DR**, which appears to be a modernized version of the highly popular FT-60R, introduced in 2004. The FT-70DR includes analog FM *and* Fusion-C4FM digital audio for a street price around $200.

Yaesu FT-70DR, fresh out of the box.

On July 16 at the Sussex County ARC Hamfest I noticed that KJI Electronics had the FT-70DR on display at the back of their booth. Price was a little below $200. The model was so new that KJI did not have all accessories yet. I decided to purchase an FT-70DR along with a matching Comet SMA24 antenna.

Self-assembly

Back home, I unpacked the FT-70DR box to see what was included. The first thing I noticed was that the radio body is manufactured in **Japan**, while other items in the box are made in China.

Items included in the FT-70DR box, L to R: radio body, belt clip, lithium-ion battery, AC charger, Operating Manual. Below are the antenna and USB data cable.

There was an SBR-24LI lithium-ion battery — nominal voltage is 7.4V with a capacity of 1800 mAh. There was also a SAD-18B switch-mode wall-wart power supply producing 10.5V at 1A to charge the battery or power the radio. I followed instructions to charge the lithium-ion battery before use by inserting the coaxial plug of the charger cable into the "Ext DC In" jack at the side of the radio. A full charge through this jack takes about 6 hours. Progress is shown by 'CHGING' and an increasing S-meter reading on the LCD display. Fast charging requires the optional SBH-28 drop-in charging cradle — which was not yet available.

Yaesu includes a YHA-72 rubber-duck antenna which is just 7" long. The transceiver has a standard female SMA antenna socket on top, so Yaesu's stock

antenna has a male SMA plug built into its base. This is the opposite way round compared with low-cost transceivers from China by BaoFeng and Wouxun. The Chinese radios have a recessed *male* connector with center pin at the top of the radio and a matching female connector in the base of the antenna.

Yaesu FT-70DR has a female SMA antenna connector at the top of the radio (right) and a male connector in the base of the stock YHA-72 antenna.

Remaining accessories in the FT-70DR box include a belt clip with metal bracket, which attaches to metal threads on the back of the radio. There is also a USB cable with type-A plug and mini-B plug for programming. A mini-USB connector is provided on the side of the radio for USB connection. The final item in the box is a 40-page printed Operating Manual. This provides a good start, but I would strongly recommend downloading the "FT70DR/DE Advance Manual" in PDF format from Yaesu's web site: https://www.yaesu.com .

Mini-USB connector and charging socket are on the radio's right side.

Hint: Print out the 48 page "Advance Manual" and the other PDF documents supplied by Yaesu for easy reference. In order to save paper, you can use Adobe Acrobat or Reader to print the document with "Pages per sheet" set to **2** and "Print on both sides of paper" checked.

When the radio is assembled with battery and antenna, I was surprised by the weight and height compared with my old IC-W32A. Weight is only 9 ounces compared with 16 ounces for the IC-W32A. Height is only 3⅞" compared with 5⅜" for the IC-W32A. After switching on, the first thing I had to do was enter my call sign.

Worm fair update

While visiting Yaesu's web site in mid-July, I noticed there was a **firmware update** already available for the FT-70DR. I downloaded the 12 MB zip file for the USA model onto my Windows 7 notebook and expanded the files, which included an "FT-70DR Main Firmware Update Instruction Manual" in PDF format. I won't bore you with all details of installing the upgrade — but it requires installation of various Microsoft components, installation of a USB driver, use of the external power supply and moving a tiny 3-position switch alongside the radio's USB connector before applying the firmware update.

Fortunately all steps in the 22-page "Update Instruction Manual" worked satisfactorily and I was rewarded with seeing firmware version 1.01 instead of 1.00 in item 59 (VER.INF) of the radio Set Mode menu.

Yaesu does not publish details of what their firmware update might have changed, but it is usually best to have the latest version, especially where digital voice is concerned.

The FT-70DR HT fits comfortably in one hand.

First impressions

With the radio assembled, charged and updated I was able to form some first impressions. The FT-70DR fits comfortably into one hand with all controls just a thumb-press away. Yaesu seems to have paid a lot of attention to keeping things simple and ergonomic, with most items configurable from front-panel push-buttons or from the 63-item 'Set Mode' menu. There is only one rotary control on top of the radio — this is used for changing channel/frequency, adjusting volume or squelch and for selecting multi-item choices from the Set Mode menu.

It is worth noting that Set Mode menu items are arranged in alphabetical order — so if you cannot remember the item number, you can just scroll through the list to find the item you need on the LCD display… for example:

1.	ANT.ATT	Switch the attenuator between ON/OFF
2.	APO	Set the length of time until the transceiver turns off automatically
3.	BCLO	Turns the busy channel lockout function ON/OFF
4.	BEEP	Sets the beep sound function

The FT-70DR does not have any of the GPS or APRS capabilities incorporated into Yaesu's higher-level digital voice radios. This was no great loss for me as it contributes to longer battery life and keeps the radio controls as simple as possible. The radio can still display call signs transmitted by other C4FM stations.

While in VFO mode, I tried selecting a two meter frequency just by rotating the dial knob — I also tried direct frequency entry from the numeric pad. Both methods work well.

Making memories

I am not fond of entering lots of frequencies into a new radio then storing each one into memory using the

radio's front panel controls. I would much rather enter these details into a computer program then transfer data to the radio's memory.

Fortunately Yaesu provides **free** Windows programming software for the FT-70DR on their web site, https://www.yaesu.com/. The programming software is named **ADMS-10** (where ADMS = Advanced Data Management System). Yaesu includes a suitable USB cable for programming the FT-70DR in the radio box.

Yaesu programming cable for FT-70DR.

[Side note: RT Systems, https://www.rtsystemsinc.com also offers programming software and a cable for the FT-70DR transceiver. Their ADMS-70D package is $49.00 for the software download plus a *different* type of USB cable with 4-conductor 3.5mm plug — which connects to the MIC/SP jack on the side of the radio.]

I have had success in the past with RT Systems' software, but this time around I decided to download the free ADMS-10 Programming Software from Yaesu's web site onto my Windows 7 notebook. Just like the firmware update, the software arrives as a large ZIP file (70 MB) which needs to be expanded using Windows' own capabilities or WinZip. One of the items available after expansion is the 'ADMS-10 Instruction Manual' in the form of a 32-page PDF file. **Hint:** print out this document for easy reference. It is full of useful information.

Zip file.

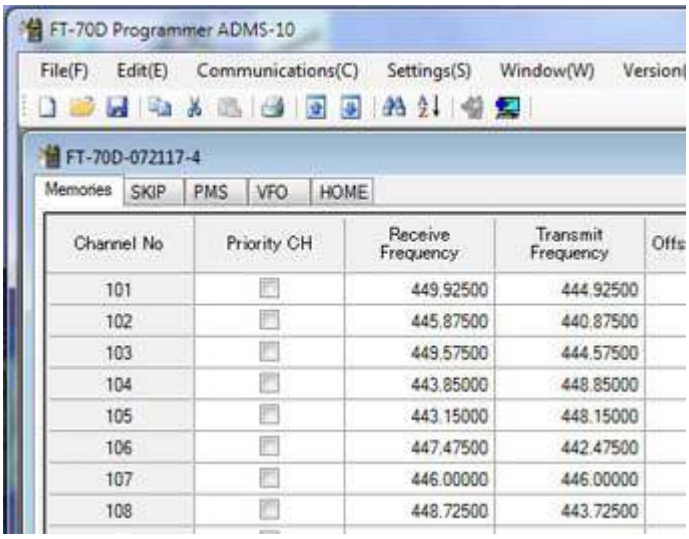
Once the ADMS-10 software was installed, I followed instructions to connect radio to notebook then install the USB driver. This involves removing the radio's battery and using the external power supply in a somewhat complicated procedure. Fortunately all worked as described and before long I had the ADMS-10 software communicating with the FT-70DR.

As with any programmable radio, the very first thing you should do is read data from the radio then store it safely in a disk file. This makes the original settings available in case of accidents. The steps for doing this using the ADMS-10 menus are: COMMUNICATIONS → GET DATA FROM FT-70D, followed by FILE → SAVE AS.

I soon had my favorite frequencies for 2 meters and 440 MHz entered into the ADMS-10 software. I decided to store 2 meter frequencies in memories 1–23 and 440 frequencies in memories 101–120. This leaves space for additional channels to be entered later on. The empty memories from 24 – 100 and 121 – 900 are automatically skipped when tuning or scanning.

Memory channels can be selected by turning the rotary dial control *or* by entering 1-3 digits of the memory number using the numeric pad.

Yaesu's software allows a large number of parameters to be entered for each memory channel. This includes the usual receive frequency, transmit frequency, repeater offset, PL tone, tone squelch or DCS code. You can also specify a six-character alphanumeric tag for each channel (e.g. PCARA9, PEARL2), set the transmitter power (LOW/MID/HIGH = ½W/2W/5W) and select whether the channel should be skipped during scanning.



Channel No	Priority CH	Receive Frequency	Transmit Frequency
101		449.92500	444.92500
102		445.87500	440.87500
103		449.57500	444.57500
104		443.85000	448.85000
105		443.15000	448.15000
106		447.47500	442.47500
107		446.00000	446.00000
108		448.72500	443.72500

*Screen-shot of Yaesu's ADMS-10 programming software. This picture only shows the top left corner for clarity — there are **50** columns available for the data in each memory channel.*

Bear in mind that this radio supports both FM and **digital voice** using Yaesu's C4FM-System Fusion. So the operating mode is another important parameter — and you can *specify this on a per-memory channel basis.* The transmission mode can be set to analog or digital and AMS (Automatic Mode Select) can be set on/off.

In my view, storage of these mode settings in memory is a **major** improvement over Yaesu's previous digital voice radios, including the FTM-100D mobile transceiver, reviewed in the November 2015 issue of *PCARA Update*. On the FTM-100D, the radio's current mode selection is applied to *all* memory channels. In contrast, I was able to program the FT-70DR with PCARA's N2CBH/R Fusion repeater on 448.725 MHz in **two** adjacent memory channels — the first with FM transmission specified and the second with C4FM digital voice transmission stored in memory. Much more convenient! Thanks, Yaesu.

[Hint: One place to hear C4FM-Fusion activity until recently was Chestnut Ridge RC's K2FJ/R repeater in Alpine, NJ on 442.900 +5.00 MHz, PL 141.3 Hz.]

Items in the "Set Mode" menu of the FT-70DR can all be specified using Yaesu's ADMS-10 programming software. Unfortunately the fixed-size window used for this activity was just too high for my notebook computer's 1366 × 768 pixel display. A couple of items at the

bottom of the window were covered up by the Windows taskbar — though I could view them by moving the task bar out of the way.

I was able to write the modified memory channels and "Set Mode" items back to the radio using the software menu choice: COMMUNICATIONS → SEND DATA TO FT-70D. I was careful to also save these modified settings to a **new** file on the computer's hard drive.

Radio in practice

With the FT-70DR programmed to my liking, I was able to take it along on various activities and see how it compared with my trusty old IC-W32A. I had substituted the Comet SMA24 dual-band 16" whip antenna in place of the stock rubber-duck as my Icom radio is normally used with a similar extended whip. The longer antenna can add around 3 S-units to signal strength.

My first impressions of light weight, small size and ease of use were all confirmed. It is very easy to select frequencies stored in memory channels using the rotary control on top of the radio. The lack of a separate volume/squelch control has not proved to be a problem — volume is adjusted by holding down the first button above the on/off switch (at the side of the radio) while rotating the control knob.

Frequencies or alpha tags are displayed on the LCD screen in large characters which are easy to read with or without the red backlight. The LED backlight illuminates the display plus the numeric pad and other control buttons on the front panel. In addition there are two large, separate LEDs at the top of the radio which are lit in color to show reception and transmission mode — they can also be used as a flashlight (Set Mode item 29 – 'LED.LGT').

Red backlight illuminates the liquid crystal display and all the front panel buttons.

The S-meter consists of the usual multi-bar display underneath the frequency read-out. The digital meter has nine bars (S-1 to S-9) which turn dark in eight separate steps as signal strength increases. This should be sufficiently accurate for direction-finding during foxhunts. Incidentally, my IC-W32A transceiver only has 6 separate steps on its 11-bar S-meter as it turns on two-bars at a time after S-1.

Signal reports using 5 watts output through the W2NYW repeater have been good, with positive comments on the modulation quality. I have also tried analog FM and digital C4FM transmission through the N2CBH/R repeater with similar results. The lithium-ion battery stands up well to long periods of transmission. Voltage monitoring through symbols on the LCD display and Set Mode item 12 'DC VLT' make sure the battery is not running too low.

Close-up of the liquid crystal display shows volume setting at left and nine bars of the S-meter below the frequency read-out. Symbol on right shows battery voltage OK.

Audio quality using the built-in loudspeaker is very good — especially considering the small size and limited number of slits in the front panel for sound to emerge.

One **major** advance over the Yaesu FT-60R — there is no "WIRES" function programmed into the SET/0 key of the numeric pad which could accidentally transmit a DTMF tone at the beginning of every over — possibly muting a repeater. Thanks again, Yaesu!

'WIRES' key on the SET/0 button of the Yaesu FT-60R.

Scanning subtleties

Scanning of programmed memories is easy to accomplish using just one hand and the front panel controls. Press the "F" key followed by "SCAN/2" and the radio will scan programmed memories until it finds a signal. You can specify how long the scan pauses and what to do when the carrier drops using items in the Set Mode menu.

Press "F", followed by "SCAN/2".

If you are in VFO mode and you press the same F-scan combination, the scan will take off from the current VFO frequency then proceed onward and upward until it reaches the upper limit of the scan range. What happens next depends on Set Mode item 50, SCV.WTH. If this is set to "BAND" then the scan restarts at the lower limit.

Be warned that the upper limit for a VFO scan is well *above* the amateur band edge. For example, if you begin scanning from a 2 meter frequency, the VFO band limits are 137–174 MHz. If you begin with a 70cm frequency, the band limits are 420–470 MHz.

When Set Mode item 50 is set to "ALL" then *all* of the VFO bands are scanned in turn. The full list is as follows:

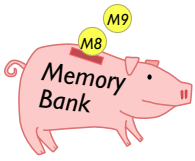
Air Band	108 – 137 MHz
'144 MHz band'	137 – 174 MHz
VHF 1	174 – 222 MHz
VHF 2	222 – 420 MHz
'430 MHz band'	420 – 470 MHz
UHF 1	470 – 580 MHz.

If all you want to do is scan an amateur band — or some other limited frequency range — you will need to make use of the "PMS" memories. In Yaesu-speak, PMS stands for "programmable memory scan". Fifty pairs of memories named L1 – U1, L2 – U2 etc. are available for storing scan limits. Once programmed, they appear just below standard memory channel 1 when turning the rotary control on top of the radio.

I programmed L1 – U1 with 144.0 – 148.0 MHz, and L2 – U2 with 440.0 – 450.0 MHz. In order to scan just the 2 meter band, you select memory L1 on the rotary control dial then press F – SCAN. The scan runs to the upper band edge and resumes at the lower band edge. For 70 cm scanning, select L2 instead.

Deposit in the bank

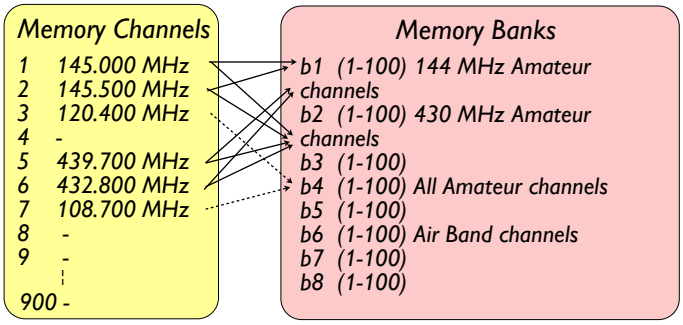
Old-style scanners used 'banks' of memory channels that could allow a sub-set of channels to be scanned. For example Bank 1 might contain memories 1-100, Bank 2 might contain memories 101-200 etc. Unfortunately, with this scheme, if you want a frequency to appear in more than one bank, it has to be programmed repeatedly.



Yaesu carries over a superior bank scheme from the FT-60R where existing memory channels can be *registered* in one or more memory banks. Details of each memory channel need only be entered once, but that channel can then be *registered* in multiple memory banks — and there are up to 24 different memory banks available.

Let me explain with an example. Suppose you enter all your 2 meter frequencies and all your 440 MHz frequencies into memory channels like I did. You may end up with more memory channels than you want to scan at one time. But you can organize your memory channels by registering them in different memory banks. For example, you might reserve the first bank just for PCARA frequencies, registering the memory channels for 146.67, 449.925, 448.725 and 146.565 MHz in Bank 1. (Make up your own bank scheme to fit *your* own interests — see sample below.)

Registration can be carried out from the front panel, but it is easier to register memory channels in different memory banks using Yaesu's ADMS-10 programming software. After registration, it is child's play to select a Memory Bank instead of the whole of memory — in the FT-70DR's memory mode you just press the "BAND" button, which is top right on the numeric pad.



Example of memory channels registered in more than one memory bank — from Yaesu FT-70DR/FT-70DE Advance Manual.

Accessories

Yaesu FT-70DR with MH-34B4B external speaker/microphone.

At the time of writing, the only optional accessory I have is Yaesu's external speaker/microphone model MH-34B4B. While Icom and Kenwood employ speaker microphones with separate 2.5mm (3⁄32") and 3.5mm (1⁄8") jacks for audio in/out, Yaesu has a single 3.5mm plug with four separate conductors, similar to a smartphone headset plug. The four-conductor jack at the end of the MH-34B4B cable plugs into the single "MIC/SP" socket on the right side of the radio, near the rotary control.

I am still waiting for some other accessories to arrive including the SHC-27 soft case, SBH-28 rapid charger and SBR-24LI spare battery.

Conclusions

After several weeks of use, I am still very pleased with the Icom FT-70DR. The radio is smaller and lighter than my previous hand-helds and does not feel as though I am walking around carrying a training weight in one hand. Yaesu engineers have done a great job of simplifying controls for a digital/analog voice radio so that frequent actions can be accomplished with just one or two key presses, or by entering a Set Mode menu which is only one level deep. Programming software is free and a USB cable is included — though software installation and radio programming are a little more complicated than they need to be.

My conclusion is that Yaesu's FT-70DR is a winner which will replace their earlier FT-60R in the popularity stakes for a simple dual-band radio. - NM9J

Across the Pond — N2KZ

[Note from the editor: Karl wrote this article for the August 2017 issue of *Communication*, monthly journal of the British DX Club, http://www.bdxc.org.uk. The original target audience was readers of *Communication* — who are mostly located 'across the pond' in the British Isles.]

2017 has become a memorable year in the world of radio. Broadcast technology has matured into a new era of delivery. Noise on medium wave and annoying picket fencing and capture effects on FM have finally found a cure. No longer are North Americans restricted to traditional over-the-air broadcast transmission. Now we listen to the Internet.

On this side of the pond, digital radio broadcasting has never been embraced as a viable method of transmission. Instead of beginning fresh with dedicated spectrum space for digital, we were offered **in-band on-channel** digital marketed as 'HD Radio®.' The 'HD' moniker only confused the public further!

The design engineers behind HD Radio had good intent but created chaotic results especially for DXers. Digital information is broadcast on broad sidebands of analog signals cluttering adjacent channels with a relentless hammering buzz. A strong HD Radio broadcast masks two channels high and low of the original frequency which really destroys all hope of DXing on five continuous channels! And, oh yeah, the system really doesn't deliver. We North American DXers have suffered through this mêlée since 2002!

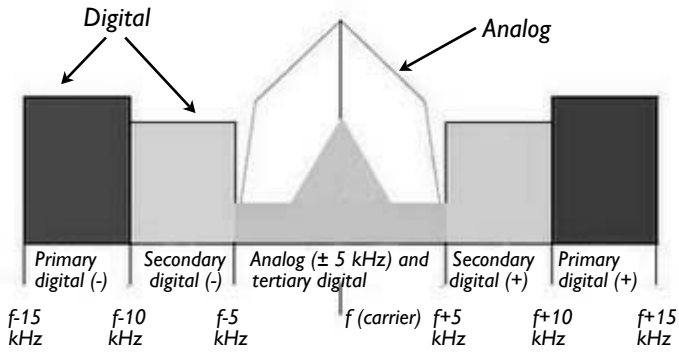


Diagram of IBOC HD Radio spectrum in hybrid AM mode. Analog sidebands are restricted to ±5 kHz above and below the carrier frequency. Digital sidebands extend ±15 kHz above and below the carrier.

HD Radio is difficult to receive. Although HD-capable radios are available as an option in many late-model automobiles, portable and home HD Radios are hard to find. You need a very strong and clean signal to make HD Radio lock in. Driving along varied terrain listening to an HD Radio broadcast can be challenging. When the digital broadcast loses lock, the radio reverts back to analog. The HD and analog broadcasts are never in perfect synchronicity so you will hear double words or upcuts as the radio automatically switches back and forth. *['Upcut': broadcasting term for turning on the microphone after the host has begun speaking. – Ed.]*

The AM HD Radio experience can be really interesting. The difference in quality between analog and HD is remarkable. Switching between severely frequency-response-limited monophonic analog to full stereo HD is profound. You'll also hear all of your co-channel, adjacent channel and man-made interference disappear when your radio locks to digital, as well. After all, HD Radio is in the digital world and immune to the noises we all know and love. Digital signals arrive alone, not with all their co-channel friends and noise!

FM HD Radio is slightly better in sonic quality than its FM analog twin. FM HD also has the ability to carry multiple broadcasts on one carrier. The most popular use of FM HD virtual channels are simulcasts of AM sister stations. Listen to Newsradio 880 WCBS in New York City when they announce their legal ID at the top of the hour: "WCBS AM and HD, WCBS FM HD-2 and WCBS online." Enough choices? (I am not convinced you can hear WCBS outside of the USA. WCBS is geolocked to North America. I could not listen to them in France and Ireland. I presume the same is true within the United Kingdom.)

WCBS-FM on 101.1 MHz carries the audio of WCBS-AM (880 kHz) on its HD2 digital subchannel.

HD virtual channels provide some interesting listening. In the New York City area there are several ethnic stations broadcasting via FM HD sub-channels with Spanish and Russian-speaking content along with multiple alternate formats like classical, jazz and pop music variants. Take a look at WNEW in New York City: 102.7 HD-1 is 'Fresh 102.7' — a simulcast of the primary analog FM signal. 102.7 HD-2 is 'Smooth Jazz.' 102.7 HD-3 is a simulcast of all-news WINS 1010 — an AM radio station.

Confusing and elaborate, isn't it? Even if you can decipher this maze, how many people actually listen to these sub-channels? When you lose the digital signal to

102.7 HD-1, your radio reverts to analog 102.7 FM. What happens when you lose the signal to one of the sub-channels? You hear silence! Grrr. HD Radio also serves as a data delivery system. I can view live color weather maps in my car that receive their data via a local station's HD transmissions.

Speaking of silence, technology has some curious quirks. When digital signals drop lock, they literally disappear. Technical broadcast types refer to this as 'falling off the cliff.' All SiriusXM® satellite receivers have a built-in noise generator to lessen this aural horror. When the bit error rate gets near the edge of losing lock, the noise generator comes on to mask the loss of signal. Their design engineers wanted to continue the analog fade-out experience!

A similar effect is built into the design of HD Radio. When digital signals get close to losing lock, a technique known as 'blending' happens. It sounds like a crossfade between two sources of audio. Because of constant changes in digital processing delay (the amount of time devices need to digitize the signal) the digital signal is always out of step with the less-processed analog signal.

Real time doesn't seem to exist anymore on North American radio. Top of the hour time pips, beeps and bells almost never accurately hit at the exact beginning of an hour. In digitized broadcast audio programme* chains, there is digital processing everywhere that slows the audio considerably. You speak into a microphone that attaches to a digital console. It travels over a CAT5 cable to a digital processor that eventually goes to a digital studio-to-transmitter link and/or a digital streamer for Internet listeners. The over-the-air transmitter includes digital processing, as well. Add more time if the programme comes to you via satellite.
**[British spelling, more to follow. –Ed.]*

If you listen using a digital receiver you add even a little more time! WCBS 880 New York's time pips are heard at about 20 seconds after every hour! Digital transmission literally takes its time!

Steve Scott is afternoon newscaster at digital broadcaster WCBS, Newsradio 880.

Look to the Sky

Is AM, FM and HD Radio enough? No! There are many more audio sources! SiriusXM *satellite* radio is also available throughout North America by subscription. It is quite similar to World-Space and the Japanese MobaHO! services, now both deceased. North America once had competing systems, XM Radio and Sirius Satellite Radio. Due to financial instability, the companies merged in 2008 to form a single monopoly.

Over 100 channels are broadcast on SiriusXM, but the content choices are limited. Many channels are dedicated to sports play-by-play broadcasts and sports commentary. Talk show channels are also found in multiplicity. SiriusXM music mixes are reminiscent of an Apple iPod on random shuffle. How I long for the sounds I listened to in decades gone by when musically trained DJs played excellent mixes, adding their commentary to a limitless playlist! You can count the classical and jazz offerings on one hand.

SiriusXM's best qualities are found in its distribution. You can pick up their signals virtually everywhere. The XM system uses geosynchronous satellites hovering about 36,000 kilometers above the equator in stable positions following the rotation of the Earth. Sirius originally relied on several constantly moving low-earth-orbit satellites flying in continuous, elliptical patterns roughly 2,000 kilometers over their service area. The Sirius LEOs actually provided a superior robust transmission system, more apt to fill in hard-to-reach gaps in coverage. Additional land-based repeaters, for both XM and Sirius, bring satellite radio content into areas filled with sky-blocking business buildings, bridges and tunnels. If you travel to remote areas, few analog AM and FM radio stations may be heard but SiriusXM shines through. It may be a Godsend if you have nothing else!

A New World

Let's enjoy the year 2017: Internet radio has changed radio forever. My reliance on portable radios and analog car reception is now a memory. At home, I can listen in perfect full quality to my computer or smartphone. My 2016 model car includes Internet radio access. Imagine rolling along listening to Radio New Zealand International or 4BC Brisbane, Australia in stereo while commuting in the New York City area. Shortwave listening was never this good!

My mobile listening is made possible by 'apps' loaded into my car's audio system using my smartphone as an Internet portal. In turn, my smartphone connects to the car's user interface (Toyota Entune) via Bluetooth. My audio choices are wide and varied: AM

Rolling along listening to Radio New Zealand International.

Radio, FM Radio, XM Radio, iPod, Bluetooth, iHeart, Slacker and Pandora. Most useful are the offerings provided by iHeart Radio. You can enjoy select stations from North America and beyond along with custom iHeart music channels very similar to SiriusXM. You can even customize music to your liking into your own 'channel.' Pandora and Slacker can also be accessed as alternative music sources. Pandora allows you to build channels based upon a single artist (e.g. Amy MacDonald Radio) to ones based upon genres (e.g. Celtic Folk Radio.) The choices are limited only by your imagination!

Services not available via iHeart can be heard using the TuneIn or Radio.com apps loaded directly onto my phone. TuneIn offers nearly every station you can think of, from Paris to Mongolia to Sydney *except* for all the stations owned by iHeart. Radio.com provides stations exclusively owned and operated by the American CBS station group. Using these three apps should cover just about all there is! Now I can listen to BBC Radio Scotland or RTE Radio One during my commutes. Kaye Adams is my new best friend! *[Kaye Adams is a Scottish Radio and TV presenter. –Ed.]*

When traveling, I access all of these apps using my smartphone via a wireless Bluetooth connection to my car's audio system. At home, my computer can double as my radio, too! Some smaller-market or independently owned stations require you to find their live audio directly on their web site or by loading their station app onto your device. It takes more effort but nearly every station now streams in one way or another.

Internet reception is remarkably reliable. I frequently make long journeys to visit my daughters at college in Boston and Delaware. Driving up and down the American northeast metroplex, I can enjoy seamless reception via the Internet for the entire drive. This is quite a breakthrough. North America has never had DAB* or DAB+ so now we have an Internet equivalent. Radio never sounded so nice and clear!

**[DAB (Digital Audio Broadcasting) and DAB+ are the digital radio standards employed in Europe, using the former Band III television frequency range of 174 - 230 MHz. See 'PCARA Update' for May 2015. - Ed.]*

Old School

I feel nostalgic when I now listen to AM and FM analog broadcasts. 50 years ago, when audio choices were few and limited, American radio was incredibly local. Entire small towns and cities would tune in to *the* local station hosted by live and local hosts and hostesses throughout their entire programme day.

As time passed, and the listening public gained more and more choices to choose from, the number of people who tuned in to local stations declined rapidly. To save money and improve their business model, many stations first converted from local programming to nationwide syndicated shows. Station owners could switch on their satellite receivers and have their automation systems insert local advertising spots and IDs. This was the beginning of 'no on-site people necessary radio.'

Today's free broadcast radio is hard on the ears! Listen to American radio during morning and evening drive times and you will often hear groups of radio hosts offer condescending banter along with endless stretches of commercials. Many shows follow this 'Morning Zoo' concept. At least to this one listener, inane talk combined with heavy commercial loads does not create large audiences (but a lot of station owners think so!) New York City has over 75 radio stations to choose from. A rating over 5% of the audience is considered huge! Where is the business model here? Radio station owners now aim to produce your 'entertainment' audio as cheaply as possible and sell a lot of adverts.

This mindset carries over to engineering, as well. When I was a young pup growing up doing beginner jobs in radio, a chief engineer would concentrate on meticulously maintaining one AM/FM station. Now engineers are 'contract employees' (freelancers) looking after multiple stations known as 'clusters.' The art of the broadcast engineer is in the hands of 'the greys' - those old engineers (like myself) with grey hair! Everything now is based on IP and computers. All the new 'engineers' are young computer guys! But who looks after the transmitters??

Do You Hear What I Hear?

Broadcasting nationwide radio is a great way to save money. Radio station programmers have plenty of shows to choose from. Just put a satellite or IP receiver on the air and walk away! No people necessary radio! Two syndicated radio shows dominate North America. Middays, hundreds and hundreds of stations broadcast the pomposity of the 'Excellence In Broadcasting Network' hosted by conservative talk show host Rush Limbaugh. Agree with him or not, Rush's rants can be quite

Rush Limbaugh broadcasts from his studio in Palm Beach, Florida. "EB" logo stands for 'Excellence in Broadcasting'.

entertaining and attract large audiences across the continent.

On overnights, the ratings leader is 'Coast to Coast AM' with George Noory. For four hours every night, George hosts an endless parade of experts chatting about conspiracy theories, extraterrestrial landings, new health cures and who knows what. This show is meticulously produced and slick. Listen in and you will instantly understand its success. You'll hear it on dozens of stations carrying 'Coast to Coast AM' up and down the AM dial wherever you tune in.

George Noory broadcasts 'Coast to Coast AM' from studios in Los Angeles, CA or St Louis, MO.

One other newfangled competitor for listeners is the world of *podcasts*. This is public access audio at its finest. Nearly anyone can post a podcast without any prohibitions regarding content, length and quality of show or worries about distribution costs. I am sure you have heard of them and they are everywhere. Having programming at your beck and call — on demand — is very convenient!

Podcasts can also be incredibly narrowcast! Consider a podcast targeted for you and me: *The Shortwave Radio Archive* at https://shortwavearchive.com. If you miss the good old days of SWLing, this is for you. Consult Chrissy Brand's 'Webwatch' column for other good ideas! *[Chrissy Brand is a DX blogger, 'RadioUser' columnist and editor of British DX Club's 'Communication' –Ed.]*

My favourite watering hole to discover quality podcasts is WNYC, New York City's premier public broadcaster: http://www.wnyc.org/podcasts/. I regularly listen to *The Daily* from The New York Times newspaper, WNYC's *On The Media* and National Public Radio's *Fresh Air*. Of course, many of the world's broadcasters also offer on-demand podcasts as well. Very interesting is Radio New Zealand International's signature news programme 'Dateline Pacific' at http://www.radionz.co.nz/international/programmes/datelinepacific. The possibilities are endless!

Yes, in the world of radio in the year 2017, the programme possibilities are endless and fascinating. Alas, there is just one thing I miss about the good old days: I live in one of the largest media markets in the world (New York City,) yet you will almost never hear direct mentions or news pertaining to my local densely-populated suburb. At its peak, there were almost a dozen radio stations serving my area in Northern Westchester. Now there is just one FM station that mentions any local news and events. It has such a wide area of coverage that it might as well be a station from New York City.

Although I live just a few miles from a relatively large city, Danbury, Connecticut (population about 85,000,) all the radio stations from that area overlook my town because we are not in the same state! I live in Katonah, *New York* which might as well be near Mars in their eyes. In the meantime, I am listening to BBC Radio Scotland. Enjoy this crazy world we live in! Any comments or questions? Please reach me at karlzuk'at'hotmail.com.

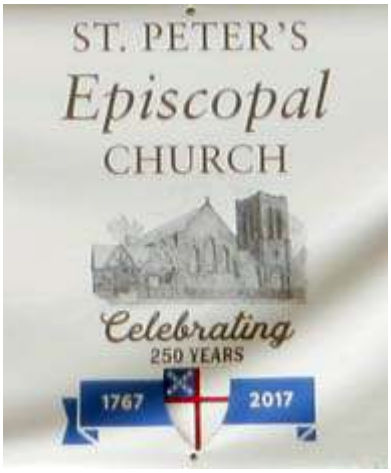
- 73 from Karl across the pond.

QST Cover Plaque award

Congratulations to Mike N2HTT for his article in July 2017 *QST* which has now won the **Cover Plaque Award**. Mike's article, "An Arduino-Controlled Digital VFO for Vintage Tube Transmitters" on pages 30-33 describes how a Silicon Labs SI5351 clock generator can be controlled by an Arduino microcontroller to produce a synthesized VFO output which is then amplified to a level suitable for driving a vintage tube rig.

The '*QST* Cover Plaque' is awarded to the author of the most popular article (by reader vote) in each issue of the ARRL's monthly journal.

Special Event Station



On Saturday September 9, PCARA will be taking part in a Special Event station, organized by David K2WPM. The "**Colonial Fair**" event is a joint effort by Van Cortlandtville Historical Society and Old St Peter's Church Committee for Restoration. The Fair is open to the public from 12 noon to 5:00 p.m. For further details see http://www.vancort.net/Events.html .

Van Cortlandtville Historical Society was founded in 1921 and has been headquartered since 1972 in **The Little Red Schoolhouse** on Locust Avenue — in the hamlet of Van Cortlandtville. The Society's activities feature a variety of speakers and presentations, with an emphasis on the rich local history of the Revolutionary War.

The Little Red Schoolhouse.

Old St Peter's Church is a historic Episcopal church and cemetery located at the corner of Oregon Road and Locust Avenue. The Church was dedicated in August 1767 and is currently celebrating its **250th anniversary**. The single-room frame building is one of the oldest churches in Westchester County. During the Revolutionary War, the building was used as a hospital by French General Rochambeau's troops before and after the decisive battle in 1781 at Yorktown, Virginia, where French troops assisted the Americans in defeating the British. Seven French soldiers are buried in unmarked graves in the Old Cemetery. General George Washington is said to have read Morning Prayer in the church when staying at the nearby Van Cortlandt Upper Manor House on Oregon Road.

Old St. Peter's Church and graveyard.

The Colonial Fair will be located in the Old Cemetery parking lot near the corner of Locust Avenue and Oregon Road. Other activities will be held at Old St. Peter's Church itself and in the neighboring Little Red Schoolhouse. Re-enactors from the NY 2nd Regiment, a blacksmith, cooper, spinning wheels, colonial cooking demonstrations, colonial toys, and refreshments will be part of the experience.

'Colonial Fair' will take place on September 9 near the corner of Oregon Road and Locust Ave.

Off-site parking will be available at the nearby Cortlandt Town Hall in Heady Street, with transport available 1:00 - 4:00 p.m. between Town Hall and cemetery. PCARA will be providing radio support for parking.

David, K2WPM has arranged an entry for the Special Event station on ARRL's web site. Here are the details:

09/09/2017 | Old St. Peters Church 250th Anniversary
Sep 9, 1600Z-2100Z, W2NYW, Cortlandt Manor, NY. Peekskill Cortlandt Amateur Radio Association. 7.260 14.330. Certificate & QSL. David Wright, K2WPM, P.O. Box 371, Mohegan Lake, NY 10547. Frequencies subject to change; watch for spots and help us celebrate this great event. George Washington spoke here. French troops buried here. David, K2WPM - check out QRZ page for updates. pcara.org

For more information about the history of St. Peter's Church, see the Peekskill Church's web site: http://www.stpeterspeekskill.org/about/our-history/ and the 'Witness to History' article linked from the following page on the Town of Cortlandt web site: http://www.townofcortlandt.com/Cit-e-Access/news/?TID=20&NID=31723

- NM9J

PCARA Foxhunt

The previous PCARA Foxhunt took place on Saturday June 3, 2017. At the subsequent PCARA meeting on June 4, a desire was expressed to improve skills and hold more than one Foxhunt per year.

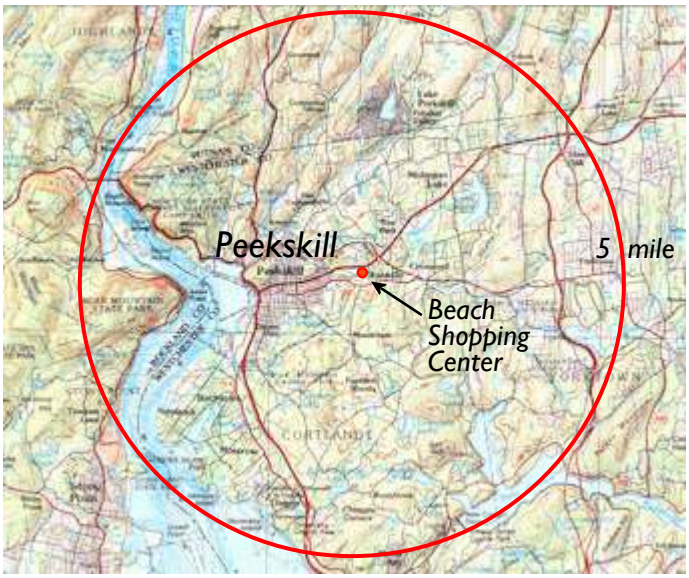
Karl N2KZ is organizing a **Foxhunt University** for Saturday September 16, starting at 2:00 p.m. The planned location is subject to School District approval, so check PCARA's nets and Facebook page nearer the time for details. Bring along your own 2 meter foxhunting equipment as there will be a practical exercise included.

A **second Foxhunt** for 2017 has been scheduled for Saturday September 23rd, with similar arrangements to the June event. See the rules below.

PCARA Foxhunt Rules

Second Foxhunt of the year: Saturday Sep 23, 2017

1. Transmission: FM simplex on 146.565 MHz, horizontally polarized.
2. Transmissions start at 3:00 p.m. for 5 minutes, followed by 5 minutes off. Second transmission commences at 3:10 p.m. 3 minutes on, 7 minutes off. The fox will not move during this time. This cycle repeats at 10 minute intervals until the last transmission ends at 4:30 p.m. when the fox will announce its location.
3. The opening transmission will include a time check for watch synchronization.
4. All contestants who wish to be eligible for a prize must book in at the **Beach Shopping Center parking lot***, in Peekskill before the start. Contestants will count as one team if more than one person occupies a car. (i.e. if three in a car, they don't get first, second and third prize.)
   * on the far west side, near Jo-Ann/CVS.
5. No contestant is allowed to move his/her car until the end of the first transmission, so take your time with the first bearing and make it a good one. The transmission will be audible from the start without a super-sensitive receiver.
6. Radio silence will be maintained by all contestants on all frequencies from the first to the last transmission.
7. No excess mileage penalty will be incurred but all contestants are reminded at all times to stay within the law and observe speed limits, parking restrictions etc.
8. The fox will be hidden not more than 5 miles from the start. The location of the fox will not be on property which is inaccessible by car.



The fox will be hidden no more than 5 miles from the starting point — within the red circle shown on the map.

9. Upon a contestant finding the fox, please do not shout or in any way give the location away to other contestants. Report your name/callsign to the fox and retire to the place of refreshment immediately. This will ensure that other contestants do not discover the fox because a group of people is hanging around nearby. It is requested that you maintain radio silence even though the fox has been found and the fact that you have found the fox should not be revealed to anyone until the place of refreshment has been reached.
10. The first competitor to locate the fox and positively identify him/her will be presented with a certificate. This competitor will be invited to assume the role of fox for the next foxhunt event.
11. Competitors should convene from 4:30 p.m. at the place of refreshment, which will be announced on-air by the fox.

Rules adapted from Bury Radio Society Fox Hunt
– Malcolm, NM9J

Mt. Beacon Tech Class

Mount Beacon Amateur Radio Club will be holding a free two-day amateur radio class and VE Test session on Sat-Sun October 21-22. Location is Dutchess County Office of Emergency Management, Poughkeepsie, NY. Further details are available from http://wr2abb.org/home/.

Peekskill / Cortlandt Amateur Radio Association

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E-mail: NM9J 'at' arrl.net
Newsletter contributions are always very welcome!
Archive: http://home.lanline.com/~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 NewYork-Presbyterian/Hudson Valley Hospital, Rt. 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 and July/August break.

PCARA Repeaters

W2NYW: 146.67 MHz -0.6, PL 156.7Hz
KB2CQE: 449.925MHz -5.0, PL 179.9Hz
N2CBH: 448.725MHz -5.0, PL 107.2Hz

PCARA Calendar

Sat Sept 9: Special Event Station, 250th anniversary of Old St. Peter's Church, Locust Ave/Oregon Rd, Cortlandt Manor.
Sun Sept 10: PCARA Meeting, New York Presbyterian - Hudson Valley Hospital, 3:00 p.m.
Sat Sept 16: PCARA Breakfast, Turco's Yorktown, 9:00 am
Sat Sept 16: Foxhunt University, location TBA, 2:00 p.m.
Sat Sept 23: Foxhunt #2, 2:30 for 3:00 p.m. start, Beach Shopping Center, Peekskill.

Hamfests

Sun Aug 27: Candlewood ARA Western CT Hamfest, Edmond Town Hall, 45 Main St., Newtown CT. 8:00 a.m.
Sept 23-24: Maker Faire, NY Hall of Science, Queens.
Sun Oct 1: Mt Beacon ARC Fall Hamfest, Employee Recreation Center, 83 Red Schoolhouse Rd, Fishkill NY, 8:00 am.
Sat Oct 7: Bergen ARA Fall Hamfest, Westwood Reg HS, 701 Ridgewood Rd, Township of Washington, NJ. 8:00 a.m.

VE Test Sessions

Sept 2, 9, 16, 23, 30: Westchester ARC Radio Barn, 4 Ledgewood Pl, Armonk, NY. 12:00. Pre-reg M. Rapp, (914) 907-6482.
Sept 10: Yonkers ARC, Will Library, 1500 Central Park Ave, Yonkers NY. 1:00 pm. Pre-reg. John WB2AUL, (914) 969-6548.
Sept 14: WECA, Westchester Co Fire Trg Center, 4 Dana Rd., Valhalla, NY. 7:00 p.m. S. Rothman, (914) 949-1463.
Sept 18: Columbia Univ ARC, 531 Studebaker Bldg, 622 W 132nd St, New York. 6:30 pm, Alan Crosswell (212) 854-3754.
Sep 15: Orange County ARC, Munger Cottage, 183 Main Street, Cornwall NY, 6:00 p.m., J. DeLorenzo (845) 534-3146.
Sept 23: PEARL, Mahopac Public Library 668 Route 6, Mahopac NY. 10:00 a.m.

Peekskill / Cortlandt Amateur Radio Association Inc.
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