PCARA Update

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Run together

The 35th Annual Harry Chapin Run Against Hunger was held on October 18, 2015 in Croton-on-Hudson, NY. Members from WECA and PCARA working together supplied communications support for the event, and the Westchester County Department of Emergency Services / RACES truck served as a base for Net control. Our efforts helped in a small way towards fighting and ending hunger in our region. To all who came out and helped, **Thank You!** A full report on our participation can be found in this month's edition of the *PCARA Update*.

Net Control for the Run Against Hunger was housed in the Westchester County RACES communications vehicle located at Croton-Harmon High School. [KB2CQE pic]

The Annual PCARA Holiday Dinner is just over a month away. This year we will be once again celebrating at the Cortlandt Colonial Restaurant on Sunday December 6, 2015 at 5:00 pm. The cost is $35.00 per person which includes entrée, dessert (cake), gratuity and tax. Soda and drinks are extra. A menu is included in this issue of the *Update*. Please consider joining us in a seasonal tradition. **All are Welcome!**

When you have a chance, please open your November 2015 issue of *QST* to p. 38 and find an article penned by our very own Mike N2HTT, entitled "The Digital Fist Recorder." Mike incorporated an Arduino Uno R3 to record and "play back code in one's own "fist" – the uniquely individual sound of hand-sent Morse code."[1] Please join me in congratulating Mike on his excellent article and masterful craftsmanship!

[1] Mike Aiello, *QST*, November 2015, p. 38.

Race organizer Mike Grayeb (center) announces runner positions as relayed to him through Greg KB2CQE (right) at the 2015 Run Against Hunger in Croton-on-Hudson.

Our next regularly scheduled membership meeting will take place on November 1, 2015 at 3:00 pm at New York-Presbyterian / Hudson Valley Hospital in Cortlandt Manor, NY. I look forward to seeing each of you there.

- 73 de Greg, KB2CQE

Contents

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 news and neighborly information.

Adventures in Dxing -N2KZ

Rust never sleeps

It's not nice to fool Mother Nature. Shiny metals love to turn to rust. What was silvery and bright yesterday may look brown and powdery tomorrow. Don't I know it! The battle is on and I'm not winning!

I have a rather large 2 meter antenna on my car: A Diamond NR22L. It stands about 11½ feet above the ground and works exceptionally well... when it works. My problem seems simple, but trouble is defiant. Rust and corrosion mute all its power. One day it will work famously. Tomorrow it may sound like it is disconnected.

The problem, dear Karl, lies within. My transmission system is not a rugged and positive circuit. I use a Yaesu FT-1900 transceiver in my car that has no true ground connection. There is no threaded screw post on the back. It relies on the negative connection to my car battery. The mount for the Diamond antenna is held on my trunk's lid by four tiny set screws. No positive ground wiring anywhere! That's it.

Rust spots under the lid of Karl's trunk show where the Diamond NR22L antenna was originally mounted.

It has become obvious that I need a few extra connections. At this writing, I am still in the process of solving my puzzle. I have spent a couple of long sessions with my Dremel® tool polishing and treating every piece of metal from battery posts to trunk metal. The results only last so long.

My next attempt will be to add a separate wire from the transceiver's body to my car's chassis metal. I'll have to use the U-bracket's screw posts as a connection point. I'll also add a direct wire from a point in the trunk that is actually a part of the main body of the car — not just the trunk lid — to the antenna mount by adding a small hole in the antenna mount itself to attach a screw and nut. I have nothing to lose! Nothing works now!

Why do I have such passion to make this work? The antenna itself is simply stellar. When it has a good ground, the signal it produces plows through the very difficult rock layered terrain and distant places where I travel. It really is an antenna like no other. The 5/8 over 5/8 design promotes you to a world where you can almost exclusively operate on simplex.

NR22L 5/8 over 5/8λ antenna

You'll meet amazing people on simplex. An interesting niche community of simplexers resides on 146.52 and 146.58 MHz. Many simplex operators enjoy finding each other while on the road. Why bother to discover the active repeater in town, its PL tone, and then someone to QSO with? Simplex is simply *simple.* One frequency, point-to-point and predictable. Often, there is only one Interstate highway passing through an area, so neighborhood mobile simplexers naturally find themselves just by monitoring '52'.

More places to have fun: Recently, I've discovered another simplex watering hole: 144.45 MHz. The operating mode is familiar FM but the polarization is *horizontal.* True 2 meter DXers operate in the lower part of the band where CW, AM and digital modes all rely on horizontal polarity. Most DXers own all-mode transceivers, so horizontal FM is an easy trick! See? There's always something new to discover on ham radio!

A little research revealed that 144.45 is also used for the SAREX Shuttle Amateur Radio Experiment group, an OSCAR repeater input satellite frequency or as an AM phone frequency used regularly in places like Erie, Pennsylvania and Los Angeles, California. To accomplish interesting communications, you need interesting antennas. I just have to make mine work!

Hopefully, my next experiments with my long 2 meter beastie antenna will finally bear fruit. If there was no research and development needed to insure a miracle signal, it wouldn't be in the true spirit of amateur radio, right? Wish me luck! Maybe you will hear me operating on 146.52 MHz from the N2KZ mobile. Stay tuned!

Got a Map?

Speaking of 2 meter DX and simplex, I often use the NOAA Weather Radio stations on 162 MHz as propagation beacons. If a usually unheard weather station is coming in, chances are your signal can reach there, too! I found a wonderful resource: a useful nationwide map of all NOAA weather radio stations on one page. You can find it at:
http://www.nws.noaa.gov/nwr/resources/NWR_poster.pdf .
I also made a 8×10 inch version including only the sta-

tions on the East Coast. It's available on the PCARA Facebook page. Google 'Facebook PCARA' and you will find it quickly. Use the NOAA stations to point your way. You'll be amazed where you can go on 2 meter simplex!

Squeak!

Can you really hear a flea? You certainly can try, but you must try hard! Back on October 8th, I was trolling one of my favorite QRP CW frequencies, 14.060 MHz, and started calling CQ with a five watt signal into my simple wire dipole hanging from nearby trees about 30 feet up. My eventual reply could only be called a whisper.

I quickly reverted to all the DSP filtering my wonderful transceiver could offer. After tinkering and fine-tuning for what felt like an eternity, I managed to eek out at least most of the letters of my correspondent's call sign. I am a very devout QRP CW operator and I will go to the ends of the Earth to pull a QRP station out of the mud. I pulled hard for this one!

I sent AGN and AGN PSE over and over. Yea! We finally touched base. It was the one watt signal of Jim, KB2JWD, down in Dowling Park, Florida. Jim is right between Tallahassee and Jacksonville, way up in the northern part of the state. I admired Jim's gear: A Yaesu FT-817 transceiver, a LDG Z-817 tuner to a G5RV Junior antenna. Jim was happily sending away with a Tic keyer built from a kit. I had to laugh! I sent Jim an RST report of 119. He replied that I was 599. We tried and tried and tried to QSO and we made it!

QSL card from KB2JWD.

Jim and I both agree that making a lot out of very little can be great fun. This is what QRP CW is all about. Adding to the fun, I discovered that Jim has a pretty darn good fist for someone who is 91 years old. Why is amateur radio the best hobby around? QSOs like this. Thanks, Jim!

A powerful station it TIS

You never know what you might hear when you are sitting in a parking lot. I just happened to be in Newark, Delaware waiting for family to join me to go to dinner. All alone for a few minutes with nothing to do, I tuned the car radio to the top of the AM dial and heard a couple of **T**raveler's **I**nformation **S**tations. One of them had a great big signal on 1670 kHz. The announcers sounded like real people, not robots. Listening to the content, its identity was a little cryptic.

"Welcome to AGREM 1670" it began and mentioned a town called Avon Grove. It is pronounced Av-in not Ave-on, so it threw me for a minute. Searching the web on my cell phone, I eventually discovered that the station was across the border in Pennsylvania. This is no simple TIS station sitting on the side of a highway with a solar-powered transmitter. It seems AGREM — Avon Grove Regional Emergency Management — actually uses it as a community information system. You'll hear all about local events, safety and weather-related warnings and traffic conditions. AM 1670 is quite a center of attention!

There are good reasons why AGREM's station can be heard: 1670 AM's antenna is high atop a water tower. A special variance of FCC regulations was approved to allow AGREM to exceed the normal maximum height for TIS antennas at 49 feet and mount their vertical stick 128 feet in the sky. AGREM was also granted an additional variance to operate their powerful station as a first adjacent to a broadcast station in nearby Lindenwold, New Jersey: WTTM on 1680 kHz (just east of Philadelphia.) AGREM 1670 truly is the little station that could! How many TIS stations do you know that can actually be heard in four states? (You can hear it across another border in nearby Maryland, too!)


AGREM's antenna on top of the water tower.

For a sample of AGREM's programming and more details about this interesting installation, take a look at: http://agrem.org/AGREM1670/AGREM_AM_1670.php#. You'll enjoy what you hear. Never forget that a car radio can pull in some interesting DX if you just give it a try!

Feed Our Goats

The weekly PCARA Old Goats Net continues to graze every Thursday night at 8 pm on the PCARA 2 meter repeater: 146.67 MHz with a minus 600 kHz offset and a 156.7 Hz PL. Join us for news, conversation and discussion. Check out the PCARA Facebook page. Simply Google 'Facebook PCARA' and you'll find us instantly. Our Yahoo Groups page is also available: https://groups.yahoo.com/neo/groups/Peekskill_Cortlandt_Amateur_Radio_Assoc/info. Enjoy our club today! Until next month, 73 es dit dit de N2KZ, 'The Old Goat.'

Run Against Hunger

The 35th Harry Chapin Memorial **Run Against Hunger** took place on Sunday October 18th — and for a second year, PCARA was there to provide communications support, this time with *additional* assistance from Westchester Emergency Communications Association (WECA).

Origins

Following the death of singer-songwriter Harry Chapin in 1981, the **Run Against Hunger** has been held annually in Croton-on-Hudson. The singer died in an auto accident on Long Island, and had long supported the cause of combating hunger in the U.S.A. The Run Against Hunger makes donations to the Cortlandt Emergency Food Bank, the Croton Caring Committee, Caring for the Homeless of Peekskill plus other organizations locally and worldwide.

Planning

PCARA met with race organizers Jud Ramaker and Mike Grayeb on September 20th to discuss their requirements and any changes since 2014. Communications would be needed for the same Mile Points and Water Stops as before, plus some additional posts not covered in 2014. These locations were explained to PCARA members at the October meeting, followed by an informal gathering at Barnes and Noble in Cortlandt Town Center on October 12 to agree station assignments and frequencies.

After the Oct 12 meeting, several Mile Posts and Water Stops still did not have an operator. Details were passed to WECA's Public Service Director Kathleen, KC2VCT and Education Director Larrie W2UL. Kathleen came back with news that WECA should have more resources available for October 18 as a result of changes to the activity in Sleepy Hollow, previously scheduled for the same day.

Meanwhile Larrie, W2UL and your editor were in discussion about improving radio coverage for the three races. The initial solution was to stay with 2 meter simplex, but change the net control antenna from an omnidirectional whip to a directional Yagi, beaming toward the New Croton Dam. Based on the profile path and RadioMobile modeling software, the station at Mile Point 3, east of the Dam, might still need to use a repeater to reach net control.

Early start

Sunday October 18 started on a chilly note with temperatures around 35°F. Ray W2CH and Marylyn KC2NKU had volunteered for net control and were first on-site at Croton-Harmon High School. They were followed by NM9J, Greg, KB2CQE and Larrie W2UL. Our first activity before the school grounds became full of parked vehicles was to raise a vertically polarized Yagi antenna on interlocking fiberglass poles, then lash it to an empty utility pole at the edge of the parking lot. Ray was parked alongside the pole and tested the Yagi antenna on his mobile radio. It seemed to be working well.

Yagi antenna raised.

Change of plan

WECA had advised that the Westchester County RACES vehicle should be available for the Run Against Hunger, so we were pleased when it came into view and parked in front of the High School. The truck is equipped with its own 6.5kW generator, telescopic antenna mast operated by pneumatic lift and multiple operator positions with radios for amateur bands and county frequencies. Operating the Net Control station from this modern marvel would be a lot more efficient than from an automobile, especially on a chilly October morning.

Westchester County RACES communications vehicle arrives outside Croton-Harmon High School ready for the Run Against Hunger. (RACES = Radio Amateur Civil Emergency Service).

Ray and Marylyn moved over to the RACES truck where Engineering Director Robert, N2DVQ programmed two of the Kenwood transceivers for the prearranged net frequencies. N2DVQ then proceeded to mount a Diamond X50A gain antenna on the telescopic mast, with assistance from Bob, N2TSE before raising it effortlessly to a height of around 50 feet above ground, easily clearing the top of the school building.

Bob, N2DVQ changes antennas on the telescopic mast mounted at the back of the RACES vehicle..

5K Walk

The first event of the day was the 5K Walk, which starts on Old Post Road South, east of the High School, proceeds around Truesdale Drive and Nordica Drive to the Croton Gorge Trail, then returns to the High School along Cleveland Drive. In addition to rest stops at each end of the Gorge walking trail, the Race Organizers had requested a third station this year at the intersection of Cleveland Drive and Gerstein Street.

Your editor watched the walkers depart from the starting point — though several youngsters set off at a *run* rather than a walking pace.

Contestants line up for the start of the 5K Walk

WECA's Alan N2YGK was positioned at Silver Lake Park, at the start of the Croton Gorge Trail. He reported four walkers *behind* the Croton Police bicycle officer who was following the end of the walk. Al K2DMV was positioned at the end of Croton Gorge Trail where the 5K course transitions onto Cleveland Drive, while Bob N2DVQ and recent recruit Jude KD2JEC worked their way around roads closed by Croton Police to reach their allocated post.

Fun Run

The one mile Fun Run begins on Cleveland Drive, south of Veteran's Corners, then follows Cleveland to Gerstein Street where the turn-around point is at CET (Carrie E Tompkins) Elementary School. The route then returns along Cleveland Drive to finish at the High School.

Your editor was once again monitoring the start point, where runners were released in two waves. Those aged 10-and-up went first, while elementary pupils aged 9-and-below were held back in a second group. Only one radio station had been requested for this short event — it was manned by Al, K2DMV at the CET School turn-around point.

The beginning of the Fun Run on Cleveland Drive, with the over-10s off to a good start.

Participants who had set off shortly after 11:00 a.m. had to find their way to the Finish line in front of the High School through a mass of runners waiting for the start of the 11:45 a.m. 10K Run. One of those Fun Run participants was veteran fund raiser Sammy Colombo, who was given an ovation on his way through the large crowd of fellow runners.

10K Run

The main event of the day is the 10K Run, which begins near Croton-Harmon High School, proceeds northwest along Cleveland Drive and Wood Road, crosses Route 129 then continues along Batten Road toward the New Croton Dam. The return route from the Dam is along Quaker Ridge Road, crossing the river at Quaker Bridge Road, along Route 129 to Jacoby Street then south on Cleveland Drive back to the finish line at the High School.

This third event requires the **most** radio support. Several volunteers from earlier races moved to new locations on the 10K course. Fortunately the combined resources of PCARA and WECA were able to fill all the

roles requested by the Race Organizers. See the table for details.

10K Run, start time 11:45 a.m. Duration ~ 1½ to 2 hr.

Station	Location	Operator
Net control	Croton Harmon High School	Ray W2CH; Marylyn KC2NKU
Shadow	Croton Harmon High School	Greg KB2CQE
Trail car	Following last runner	Larrie W2UL
Water Stop #1	140 Batten Road	Bob, N2DVQ; Jude,KD2JEC
Water Stop #2	East end of Croton Dam	Steven, K2OFD
Mile Point 3	Croton Dam Rd & Quaker Ridge Rd	Henry, KB2VJP
Water Stop #3 / Mile 4	Danish Home	David, KD2EVI
Mile Point 5	Quaker Bridge Rd & Niles Rd	Mike, KB2IGG
Water Stop #4	Jacoby Street	Gary, WB2HNA
Mile Point 6	Cleveland Dr & Alexander Lane	Al, K2DMV

Two hundred and thirty seven runners set out from the crowded Start Line just east of the High School, with Bob, N2TSE reporting the outcome.

They're off! Start of the 10K Run in Old Post Road South, close to Croton-Harmon High School.

Net control was then able to take reports from Mile Points and Water Stops of the leading runners for relay back to the organizers' shadow Greg KB2CQE. Meanwhile the very last runners were being followed by the Prius Trail Car driver, accompanied by Larrie W2UL with Icom IC-706 and portable power supply. The Trail Car was also picking up Race Signs as it made its way toward the Croton Dam.

Simplex communication was possible from net control to all stations around the course — with the exception of Mile Point 3, where once again Henry KB2VJP had to rely on the PCARA 2 meter repeater to reach net control. An examination of terrain over the path from the High School shows higher ground at Nordica Hill (230 feet), at the Danish Home (390 feet) and very close to 'Mile Point 3', which lies at 200 feet.

Larrie W2UL prepares the Prius Trail Car to quietly follow the last runners around the 10K course.

In addition to passing details of race leaders, our radio operators at the out-stations also provided valuable information about some less routine matters. Ray, W2CH reports that Steve, KD2OFD at Water Stop #2 called in to say runners were having a problem with a chain across Croton Dam Road— which would also block the Trail Car when it had to cross the Dam. Fortunately, word was passed via Greg, KB2CQE to the race organizers who arranged for the Department of Environmental Protection to open the barrier, allowing the Trail Car to pass.

Greg KB2CQE acted as radio 'shadow' for the race organizers. The RACES vehicle with mast raised is also visible in this shot.

Gary WB2HNA arrived at Water Stop #4 in good time, well before any roads were closed. His contingent of Girl Scouts with water cups did not arrive until 11:30 a.m.

The first runners to approach the 10K Finish line were reported to net control by Al, K2DMV, from his station at Mile 6. Bib numbers were passed to 'shadow'

KB2CQE so Mike Grayeb could announce who was coming in over the (very loud) public address system. First past the post was #167, Adrian Stiefelmann in an impressive 38 minutes. Last to finish was #237, Laura Moore who completed the course in 1 hr 55 minutes.

Runner #167, Adrian Stiefelmann crosses the 10K Finish Line after a mere 38 minutes. Details had already been passed to the event organizers via radio.

Larrie W2UL followed the last runners to the Finish in the Trail Car then returned the race signs that he had picked up around the course. At that point, all remaining stations were stood down and the joint PCARA/WECA operation was concluded.

Observations

Ray W2CH reported that — for net control — things went smoothly for the three race events, with no casualties or anything else out of order. Some of the stations using handi-talkies were a little difficult to hear, but the set-up in Westchester RACES' Communications truck helped isolate outside noise and it was certainly more comfortable than a regular vehicle in the cold weather. (Incidentally, **snow** was observed at the school and at several outstations, shortly after 12 noon.)

Ray W2CH operates as net control from the RACES vehicle, accompanied by Marylyn, KC2NKU.

Ray also reported that the PCARA and WECA members worked well together and his time in the communication truck went quickly as the operators were kept occupied with all the events that occurred.

The only mishap that your editor heard about was when David, KD2EVI suffered some vehicle damage straddling a ditch near the Danish Home, but he made it home satisfactorily. Back at the High School, a bright orange safety cone that was guarding the area around the Yagi mast was attacked by an unknown vehicle, leaving black tire marks all over it.

Our thanks to all volunteers from **WECA** and **PCARA** who contributed their time, equipment, expertise and vehicles to the **Run Against Hunger**, keeping participants safe on their way around the course.

Full details of WECA and Westchester County ARES/RACES are available at the WECA web site, http://www.weca.org. Keep an eye on the Run's own web site http://www.runagainsthunger.com for details of event winners, pictures and funds raised. - NM9J

CW fist bump

If you turn to page 38 of the November 2015 *QST*, you will find an article entitled "The Digital Fist Recorder." This describes an electronic keyer based on the Arduino microcontroller, which captures the individual characteristics of hand-sent Morse Code. Keying of high or low voltage transmitters is provided by a 'KeyAll' board. The author is our very own PCARA member, **Mike N2HTT.** Congratulations to Mike on having your article published in the premier amateur radio journal.

The Digital Fist Recorder

Play back Morse code messages in your own "fist" with this Arduino-based recorder.

Mike Aiello, N2HTT

Article by Mike N2HTT appears in the November 2015 QST.

Club members had a preview of Mike's work during a show-and-tell session at the February PCARA meeting. Words and pictures can be found in the *PCARA Update* for March 2015.

Yaesu FTM-100DR –

First impressions

Spoiled for choice

After PCARA's acquisition of a Yaesu Fusion DR-1X repeater, I was looking for a suitable radio that would be capable of "Continuous 4-Level Frequency Modulation" (C4FM). Leaving aside Yaesu's $1,500 FT-991, the choice is currently limited to two Yaesu handi-talkies, the FT1DR and FT2DR and two Yaesu mobiles, the FTM-400DR and FTM-100DR.

Some of these choices were quickly eliminated. The FT1DR is a small HT with only one rotary control. In my opinion, this makes adjustment of volume and squelch far more difficult than it ought to be. The FT2DR HT and FTM-400DR mobile both have touch-screens to handle the majority of their settings. My own experience with touch-screens on the DR-1X repeater and in my own vehicle convinces me that these devices are *not ideal* for a mobile environment. Making selections is unreliable and there is insufficient tactile feedback for those times when you can only glance down at the screen…

Touch-screens I have struggled with…

"Mr. Worf, fire photon torpedoes!"
"Sorry captain, but the touch-screen has malfunctioned." - No thanks.

The only choice left on my list was the **Yaesu FTM-100DR**, introduced in mid-2015. The FTM-100DR is a "dual-band", single-receive mobile covering 2 meters and 440 MHz. The control panel on the front of the radio has a dot-matrix monochrome liquid crystal display which is significantly smaller than the color LCD on the dual-band FTM-400DR.

Yaesu FTM-100DR (left) alongside the more-expensive FTM-400DR (right). The radio bodies are very similar.

Strangely enough, the main transceiver body behind the detachable control panel looks *almost identical* to the FTM-400DR and to the mobile unit inside the DR-1X repeater. Technical specifications are the same as well. (I wonder how much they are alike inside the metal case.)

Time to buy

From October to December 2015, Yaesu is offering a $60 mail-in rebate on the FTM-100DR. During BARA's Fall Hamfest, I paid a visit to KJI Electronics' stand where I was told by Gene, K2KJI that his company is now a factory-authorized Yaesu dealer with a full stock of mobile and portable equipment. As a result I came away from the Hamfest with a brand-new FTM-100DR in the trunk.

Out of the box

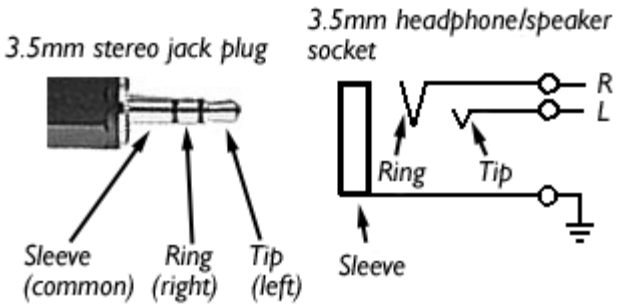
While unboxing the new radio, I was pleased to see that most of the accessories for fixed or mobile installation are already included. This is in contrast with a recent Icom mobile that does not include any mounting brackets! Yaesu includes metal brackets for the detachable control head and the main body, plus a 10 foot separation cable to link them together. Also in the box is an SCU-20 USB to mini-DIN cable for connection to a computer. This allows updating radio firmware and programming of frequencies with optional software.

Unboxing the Yaesu FTM-100DR reveals all the parts for a fixed or mobile installation.

One unusual item in the box was a ⅛" (3.5mm) stereo to mono conversion adapter. External speaker output on this Yaesu mobile radio is through a ⅛" *stereo* socket on the rear panel, with audio out to *both* channels, left-tip and right-ring. Use of a standard external speaker wired to a ⅛" mono plug would cause problems by shorting out one side of

Stereo to mono adapter included with FTM-100DR.

the audio amplifier — so the adapter is necessary. (The Operating Manual states incorrectly on page 115 that audio output is only on the left channel.)



Right-channel output from a 3.5mm stereo socket to a stereo jack plug would be shorted out by a mono plug.

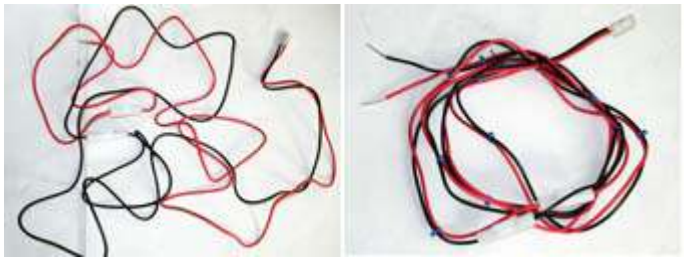
In order to connect the supplied MH-48 microphone, I had to detach the control head from the main body, then plug the microphone's 6-way RJ-11 plug into a matching socket on the radio body. If you decide to mount the control head some distance from the transceiver body using the supplied separation cable, you may also need a microphone *extension* cable since there is no matching 'MIC' socket on the control head.

The control head must be detached in order to connect the MH-48 microphone.

While the control head was detached, I decided to insert a microSD card into the radio body. This allows backing up of radio settings and several other functions. The card has to be inserted label-side *down* so the notch is on the left.

MicroSD memory card ready to be inserted into the body of the radio. The notch should be to the ***left****, not as shown.*

The final item to come out of the cardboard box was the 12 volt DC power cable. This was the usual 14 gauge stranded cable with two-pin plug and in-line fuses. Unfortunately, as supplied, the red and black wires were completely separated and soon become an untidy mess. I fixed the problem with nylon cable ties.



The DC power cable had its red and black wires separated (left). This was fixed with cable ties every 8 inches.

Power up

After connecting the radio to a dummy load and 12 volt power supply, I switched on for the first time and the display showed "Please enter Your Callsign -MAX 10 letters-". I followed the instructions to enter my call using front panel controls, then the radio restarted and came up on the "A" band with the VFO set to 144.000 MHz and the "B" band set to 430.000 MHz. This display can mislead you into thinking the radio is capable of simultaneous operation on two bands at once — it isn't.

Initial frequency display after entering the station callsign.

Switching the radio on and off is accomplished using the ON-OFF/LOCK button on the left side of the control panel. Just tapping this button *locks* the controls. You have to *hold* this button down for 2-3 seconds in order to turn the radio on and off.

The display has a white-light LED backlight which is unbelievably bright at its default setting. The first thing I did was dive into the radio menus and reduce brightness level from 7 to 3. One advantage of the *monochrome* LCD is that the display is still visible at minimum brightness setting, when the backlight has been switched off. This property also allows easy viewing in bright sunlight.

Brightness of the LCD backlight can be adjusted using: DISP→1 DISPLAY→2 LCD BRIGHTNESS, then rotate the control knob.

Not your favorite radio?

For several decades, most of my VHF/UHF radios have been from Icom, and I grew accustomed to Icom's way of doing things. Yaesu C4FM radios have a different philosophy, so I had to consult Yaesu's literature for the FTM-100 quite frequently. Fortunately the FTM-100DR Operating Manual is supplied as a **paper book**, with the other manuals available as PDF downloads.

FTM-100DR Operating Manual

I soon found out that the Yaesu Operating Manual has a few faults. The index at the back of the book is almost useless as it simply lists the section headings in alphabetical order, without rearranging their key terms. The Table of Contents at the front of the book is more useful than the Index at the back for finding relevant topics. I came across several mistakes in the Operating Manual, which makes me think it needs proof-reading by someone with a radio in front of them.

I pressed on with discovering what was new in the radio. Whenever the Operating Manual provided no help, I checked conversations on the "Yaesu System Fusion" Yahoo Group. Another useful reference for all things C4FM is K9EQ's "Fusion Help" pages:
http://www.hamoperator.com/Hamoperator/Fusion_Help.html

Under control

One of my preferences on a dual-band radio is separate rotary controls for volume and squelch. These features are present on my dual band Icom transceivers. The FTM-100 is one-band-at-a-time, so it should only need one volume and one squelch control. Yaesu does provides a rotary volume control on the left side of the front panel but there is no rotary control for squelch. Instead, this has to be adjusted through the "SQL" button. Pressing this button brings up a bar graph on the display, which can then be adjusted up and down using the right-hand control knob. Be quick though — if you don't move the control knob soon enough, the LCD reverts to normal display.

Squelch adjustment using the 'SQL/VOICE' button on the FTM-100D front panel.

I began by manually entering a few frequencies into the VFO, then storing in memory. Frequencies can be dialed-in using the right hand control knob or entered directly from the numeric pad on the MH-48 microphone.

Mixed signals

After I had entered the first frequency, I noticed the communication mode was set to "AMS". This is Yaesu-speak for "Automatic Mode Select". In other words, the radio will listen to the type of signal being received from a distant simplex or repeater station, then adjust its own modulation mode to match.

There are four modulation settings available from the front panel "**Dx**" button and two separate settings in the menu system which control how the FTM-100D deals with all the different modulation modes. This creates a complicated situation which is not well-described in the Operating Manual. My own summary of the practical effects is as follows.

1. Two analog modulation modes and three digital modes are available on the FTM-100D. The two analog modes are standard **FM** for simplex or repeater use and **AM** for air-band reception. The three digital modes are:

DN — Digital Normal, simultaneous digital voice and data transmission with error correction,
VW — Voice Wide, digital voice transmission using full available bandwidth,
DW — Data Wide, data communication using the full available bandwidth.

2. It is **not** possible to store modulation mode into a memory channel and have it reliably recalled when the memory is selected. Instead, the current modulation mode chosen for either "Band A" or "Band B" is applied to *all* memory channels in that band. The *only exception* seems to be when analog FM or AM receive mode is stored in memory and no other mode has been subsequently selected.

(If you are looking for the aircraft band, note that — by default — reception on the FTM-100D is limited to 137-174 MHz and 400-480 MHz. In order to receive *outside* this range – including the 108-137 MHz AM aircraft band – you have to change the Menu item: 8 CONFIG → 11 RX COVERAGE from NORMAL to WIDE.)

3. There are several menu choices available for setting the transmission mode after "AMS" has detected the received signal's modulation. The default setting is "2 TX MANUAL", which matches the transmit signal to whatever was received. This setting has an option to change between digital and analog mode by *flicking* the microphone press-to-talk switch briefly, before commencing transmission.

4. The mode in use for analog reception and transmission is indicated by the *lower* of two large LEDs on the front panel. Green indicates analog reception, red indicates analog transmission, blue indicates digital voice receive *and* transmit. The upper LED just shows green for receive and red for transmit, independent of mode.

*The upper LED on the front panel is lit **red**, indicating **transmit**, while the lower LED is lit **blue** showing **digital** voice mode*

For more information on Yaesu's different Fusion C4FM modes, see the review of the FTM-400DR and FT1DR by Gary KN4AQ in *QST* for September 2014.

PL please

There was one more hurdle to overcome before I could store my first repeater frequency into memory and that was setting the CTCSS (PL) tone. Yaesu's Operating Manual explains in the "Communicating" section how to change the default 100 Hz PL tone to a different frequency, but then fails to explain how to turn the PL tone *on* until 40 pages later, in the "Convenient Functions" chapter. How to do it? You go into the menu system by holding down the "DISP" button then select: 4 SIGNALING → 4 SQL TYPE, followed by a choice of either OFF, TONE ENC *or* TONE SQL using the rotary dial.

Cloning around

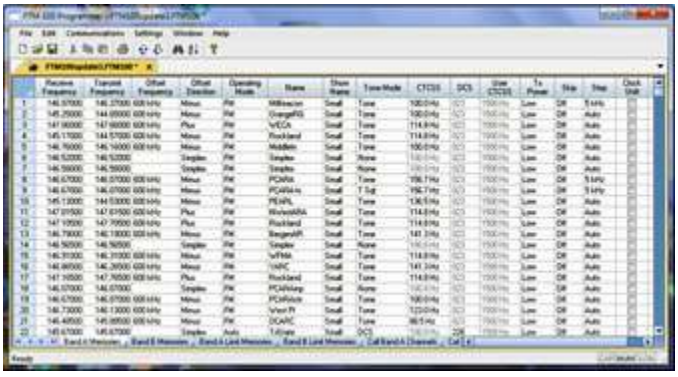
I was able to set up a couple of frequencies with different offsets and PL tones then store them in memory using just the controls and buttons on the radio. But I had *forty* channels to set up and I decided there had to be a better way. I checked on RT Systems' web site https://www.rtsystemsinc.com/ and found they already have software available for Yaesu's C4FM HTs and mobiles. RT Systems' ADMS-100 software for the FTM-100D costs $25.00 for the version supplied without any microSD card. It can be downloaded directly from RT Systems' own web site. After a few minutes, I had the software stored on my computer, with a separate copy burned onto CD-R for insurance.

The ADMS-100 software can be used in two different ways. You can connect the computer *directly* to the radio using the SCU-20 USB to mini-DIN cable that is supplied with Yaesu's FTM-100D. Or you can plug a microSD card into the computer, store radio settings on the card, then transfer the microSD card to the radio. I chose the first way.

While installing RT Systems' software on my Windows 7 notebook, I noticed that it had set-up a Prolific USB driver as COM6. With the SCU-20 cable connected to computer and radio, I was then able to use the software's "Communications" menu to "Get Data from Radio" and save the data to a computer file.

SCU-20 USB to mini-DIN computer connection cable plugs into back of radio.

Next, I entered all my favorite frequencies for the 144 and 440 MHz bands into the spreadsheet-like programmer window. Following advice in the various forums, I did **not** store VHF frequencies in "Band A" and UHF in "Band B" because you can only scan one of these two 'bands' at a time. Instead I stored the VHF frequencies in memories 1-22 of "Band A" and the UHF frequencies in memories 101-119 of the same band. That large gap between memory 22 and 101 is not a problem as the radio skips past empty channels – and it leaves plenty of room for future expansion.



Screen-shot of RT Systems' ADMS-100 software for programming the Yaesu FTM-100DR transceiver.

Transferring the contents of memory and other settings from the computer to the radio is straightforward using menu choice: "Communications" → "Send Data to Radio". The software tells you to select Menu item '13 RST/CLONE' on the radio, followed by '7 CLONE' then the direction '2 OTHER→THIS RADIO'. Two minutes later the transfer completed, the radio reset and all my new frequencies were stored inside the radio.

Performance

I carried out a few initial tests and was pleased to see that both analog FM and digital C4FM transmit modes were working on the various frequencies. To date, the only test I have been able to carry out on C4FM was as far as the PCARA Fusion repeater which is currently operating on 449.925 MHz, –5 MHz, 103.5 Hz PL. The repeater is located just within reach of the editor's desk.

Scanning speed across the memory channels is **very** fast. Forty channels are scanned in about 4 seconds. Using the RT Systems software, I had stored a suitable name for each frequency. If the size chosen for the name is "small" then these names appear on the top line of the dot matrix display, with frequency shown on the larger bottom line, beneath the 10-bar S-meter.

Example of a stored memory channel with (small) name displayed on the upper line of the LCD display.

Oddly, if you recall a memory channel, then make a change to it — for example output power level — the change is retained *without* needing to save to memory again.

One item missing from this Yaesu radio is an RF attenuator. Modern Icom radios can reduce receiver gain when the rotary squelch control is rotated past 12 o'clock. But the FTM-100D runs at full gain, all the time. So far this has not been a problem, though I have had to turn the squelch control to the second step above wide open in order to avoid memory scans from stopping on very weak signals.

MH-48 microphone with red backlight on.

While investigating the squelch setting, I found that the MH-48 microphone has a "squelch defeat" function stored on Program Key **P1**. This only works in analog FM and AM mode, not in AMS mode.

Default settings for the other Program Keys on the microphone are **P2:** home channel (equivalent to a call channel), **P3:** mode select, **P4:** output power select. The following buttons on the microphone are also programmed with useful functions: ***, #, A, B, C, D**.

But wait, there's more...

This introduction has only touched on the capabilities of Yaesu's FTM-100D. There are additional features that I have barely explored yet. One item that shows up immediately on the display is the built-in GPS receiver with receive antenna mounted at the top of the removable control head. The GPS receiver synchronizes with visible satellites relatively quickly and shows your direction of travel and velocity on the main display, alongside the frequency information. Location information derived from GPS can then be exchanged with other stations on analog FM using APRS (Automatic Packet Reporting System) or by simultaneous voice and data transmission when in digital C4FM mode.

With the radio tuned to the appropriate frequency and the APRS modem turned on, incoming data are displayed.

For a simple introduction to APRS monitoring all you need do is tune the FTM-100D to 144.390 MHz FM then turn on the radio's built-in APRS modem using menu item: 10 APRS → 5 APRS MODEM → 1 ON. Incoming data packets will then be displayed on the liquid crystal display.

All these additional capabilities are covered in three *separate* Instruction Manuals for the FTM-100DR, downloadable from Yaesu's web site as large PDF files. They are the "APRS Edition", "GM Edition" and "WIRES-X Edition". "GM" stands for "Group Monitor", which allows monitoring the location of other C4FM-equipped stations on the same channel and in-range. "WIRES-X" is Yaesu's system for linking radios and repeaters via the Internet, allowing worldwide conversations on VHF and UHF radios.

Was it worth it?

Future of the various digital voice modes in amateur radio is still uncertain. An article by K1IW in April 2015 *QST* has a comparison of their characteristics. Icom D-Star and Yaesu Fusion radios are generally capable of analog FM as well as digital voice, so you are not locked into digital-mode-only as with some other radios. And the Fusion DR-1X repeater is capable of both FM and C4FM modes, transmit and receive. Yaesu's C4FM is the 'new kid on the block' and its capabilities are still being explored and developed. A new firmware version could very easily change some characteristics of the radio as described in this review.

Yaesu's C4FM radios are being offered at a good price point, especially with the mail-in rebate, so you might want to consider one. Even if you never use C4FM, the FTM-100DR is still a good, modern FM radio with lots of features. - NM9J

New York QSO Party

The New York State QSO Party took place on Saturday October 17, 2015. PCARA sponsors two awards in this annual event, the "NY Multi-One Low Power" plaque and the "Non-NY Phone Low Power" plaque.

PCARA's club entry was organized by Joe, WA2MCR, using club callsign W2NYW (New York Westchester). As in 2014, Joe had brought his radios out of the basement up to the sun-room for a bright and airy operating environment. Unfortunately the Yaesu FT-1000MP suffered a problem, so this year the HF transceiver of choice was an Icom IC-7410. Joe had a new notebook computer using the same software as previously — the NYQP version of N3FJP's logging software as used at Field Day.

Your editor joined Joe for part of the contest and settled in to make as many phone and CW contacts as possible in the available time. Most of the activity on Saturday afternoon was taking place on 40 meters, where the "Carolina Windom" OCFD antenna gave a good account of itself. Later on, Joe changed bands to 80 meters and made additional contacts on SSB and CW. A few phone QSOs were also made on 20 meters.

Joe WA2MCR operates PCARA's club station entry in the 2015 New York QSO Party.

Radio conditions were not as good as in 2014, but W2NYW was able to contact a total of 30 states and Canadian Provinces, plus 51 of the 62 available New York counties for an overall multiplier of 81. There were 67 CW contacts (which count for two points) plus 225 phone contacts, for a total of 359 points. When multiplied by 81, this gives an overall total of 29,079.

Year	QSOs	Points	Multiplier	Claimed Total
2013	300	345	83	28980
2014	463	548	100	54800
2015	**292**	**359**	**81**	**29079**

Logs have already been submitted. Keep an eye on the NYQP web site, hosted by Rochester DX Association for the final results, which usually appear in late February. See http://nyqp.org.

Fall backward

It's that time of year when mighty oak trees are hurling little acorns at us and the leaves stop producing green chlorophyll. Along with the lengthening nights that produce these seasonal effects, here is a reminder that clocks "fall backward" at 2:00 a.m. on Sunday November 1, 2015. From that point on, our region changes from Daylight Saving Time to Eastern Standard Time.

Don't forget to correct any of your clocks that still need manual adjustment — preferably before you go to bed on Halloween night, Saturday October 31. Otherwise you might turn up *one hour too soon* for the next PCARA meeting, scheduled for **3:00 p.m. EST** on Sunday November 1.

Holiday Dinner

The 2015 PCARA Holiday Dinner will take place on Sunday December 6th at the same location as last year — the Cortlandt Colonial Restaurant in Cortlandt Manor. Start time is 5:00 p.m.

The restaurant is at 714 Old Albany Post Road. Take the Bear Mountain Parkway to the Highland Ave exit and head north. Proceed down the hill and across the bridge. Full directions are available at the web site: http://www.cortlandtcolonial.com/pages/directions.html .

The dinner menu chosen is the same "Package Number Three" as in previous years, along with the Custom Cake. This includes:

Open Soup and Salad Bar
Coffee/Tea
choice of:
Prime Ribs of Beef
Grilled New York Strip Steak
Grilled Pork Tenderloin Medallions
Jumbo Shrimp with crabmeat stuffing
choice of Chicken (Marsala, Chardonnay, Sherry, or Madeira)
Penne ala Vodka (Traditional or w/grilled chicken)

Cost will be $35.00 per head including service, but not including additional soda or alcoholic drinks.

Peekskill / Cortlandt Amateur Radio Association

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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

Sun Nov 1: PCARA Meeting, NewYork-Presbyterian / Hudson Valley Hospital, 3:00 p.m.
Sun Dec 6: PCARA Holiday Dinner 5:00 p.m., Cortlandt Colonial Restaurant.

Hamfests

Fri Nov 27: Fairlawn ARC Auction, Fair Lawn Senior Center, 11-05 Gardiner Road, Fair Lawn, NJ. 6:00 p.m.
Sun Jan 10, 2016: Ham Radio University, Briarcliffe College, 1055 Stewart Ave, Bethpage, NY. 7:30 a.m.

VE Test Sessions

Nov 1: Yonkers PAL Ham Radio Club, 127 N Broadway, Yonkers NY. 2:00 p.m. Pre-reg. M. Rapp (914) 907-6482.
Nov 1: Yonkers ARC, Yonkers PD, Grassy Sprain Rd, Yonkers. 8:30 a.m. Pre-reg. John Costa (914) 969-6548.
Nov 7, 14, 21, 28: Westchester ARC Radio Barn, 4 Ledgewood Pl, Armonk NY. 12. Pre-reg. M. Rapp, (914) 907-6482.
Nov 12: WECA, Westchester Co Fire Trg Cen, 4 Dana Rd., Valhalla, NY. 7:00 p.m. S. Rothman, 914 831-3258.
Nov 16: Columbia Univ VE Team ARC, 531 Studebaker Bldg, 622 W 132nd St, New York. 6:30 pm. Alan Crosswell 212 854-3754.
Nov 20: Orange County ARC, Munger Cottage, 183 Main Street, Cornwall NY. 6:30 p.m. Thomas R. Ray (845) 391-3620.

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