PCARA Update

Volume 23, Issue 3 Peekskill/Cortlandt Amateur Radio Association Inc. March 2022

Bring yourself

We crushed it with regard to attendance for a PCARA **Breakfast.** At our Saturday February 19, 2022 gathering at Uncle Giuseppe's Marketplace in Yorktown Heights, NY, we had **fifteen** attendees. We almost ran out of tables — it's a good thing Uncle Giuseppe's Marketplace will be moving to a larger venue soon. I had to keep moving from one end of the tables to the other, to keep up with all the discussions and conversations! As usual, I came away from breakfast with new ideas for projects and activities. Thanks to all who attended.

A PCARA **V.E. Test Session** was held at a new location on Wednesday February 23, 2022 at 7:00 p.m. The session was held at the Putnam | Northern Westchester BOCES Tech Center in Yorktown Heights, NY. Our one candidate of the evening was also an instructor at the Tech Center, who will be developing a program on Amateur Radio for the students there. Dr. Joseph DeCicco earned his Technician's license and left with a CSCE in hand. Congratulations Joe and welcome to Amateur Radio! We look forward to working with you.

V.E. Test Session on February 23rd at Putnam|Northern Westchester BOCES Tech Center in Somers/Yorktown.

An encore presentation of "**Magic of Amateur Radio**" by Todd N2MUZ is scheduled for Monday February 28, 2022 at 7:00 p.m. at the Putnam Valley Free Library Community Room in Putnam Valley, NY. The presentation will also be streamed on Zoom. To register to attend in person and for Zoom details see: https://putnamvalleylibrary.org/calendar/?cid=mc-ee-bc9a21598585f5d8bea2ab08144d58&mc_id=4188. If you know anyone who you think would like to learn about Amateur Radio, please let them know.

Well-attended PCARA Breakfast at Uncle Giuseppe's on Saturday February 19.

The PCARA **Bring and Buy Auction** has been rescheduled for Saturday March 5, 2022 at 9:00 a.m. at the Cortlandt Town Center CUE Room. Pack up all your no longer desired gems and join us for a most enjoyable time — FUN guaranteed.

The next PCARA **Breakfast** is on Saturday March 19, 2022 at 9:00 a.m. at Uncle Giuseppe's Marketplace in Yorktown Heights, NY. Let's try to set another record attendance. The breakfast will be followed by a PCARA **V.E. Test Session** at the Putnam Valley Free Library Community Room, 30 Oscawana Lake Road in Putnam Valley, NY. *Continued on page 2* ⇨

Contents

We are still searching for a location in which to hold regularly scheduled monthly membership meetings. Please stay in touch via the PCARA website and Google Groups. Until we meet again, please stay safe!

- 73 de Greg, KB2CQE

PCARA Board

President:
Greg Appleyard, KB2CQE; kb2cqe 'at' arrl.net
Vice President:
Bob Tarsio, N2CBH; bob 'at' broadcast-devices.com
Secretary:
Lou Cassetta, KD2ITZ; radiocassetta 'at' gmail.com
Treasurer:
David Fredsall KD2EVI; joanndavidss88 'at' verizon.net
Director:
Mike Dvorozniak, W2IG
Vice President Emeritus: Joe Calabrese, WA2MCR.

Net night

Peekskill/Cortlandt Amateur Radio Association holds a roundtable net on Tuesday evenings at 8:00 p.m. and a directed 'Old Goats' net on Thursday evenings at 8:00 p.m. Both events take place on the 146.67 MHz W2NYW repeater, offset -0.600, PL 156.7 Hz.

Join the roundtable to find out what members have been doing or join the Old Goats with net control Karl N2KZ for news and neighborly information.

V.E. Test Session

PCARA's latest Volunteer Examiner Test Session took place on Wednesday evening, February 24th at a new location — the **Tech Center** of Putnam | Northern Westchester BOCES (Board of Cooperative Educational Services). The Tech Center, located at 200 BOCES Drive, Yorktown Heights occupies a long, multi-level building stretching down the hill, where teenagers can enroll in one of forty career and technical education courses. Some of the subjects taught include microcomputer technology, computer graphics, construction electricity, digital film and sound, auto mechanics, carpentry and welding.

Entrance to BOCES Tech Center in Yorktown Heights.

There was one candidate for the V.E. Test Session — Joseph DeCicco successfully passed Element 2 and qualified for his Technician License.

Joseph DeCicco receives his CSCE from Stan WA2NRV.

Thanks to the four volunteer examiners who supervised the session — V.E. Team Liaison Mike W2IG, Lou KD2ITZ, Stan WA2NRV and NM9J. PCARA's president Greg KB2CQE was also present to provide encouragement.

We should add a special thank you to Tech Center Principal James Belluci who paid a visit to the test session and gave a guided tour of the Center's extensive facilities to Greg and your editor. The multi-level building alongside Pines Bridge Road houses some very impressive training capabilities, from the vehicle repair shop to a fully equipped video studio..

Putnam|Northern Westchester BOCES Tech Center lies alongside Pines Bridge Road.

Next Test Session

PCARA's next V.E. Test Session has been scheduled by Lou KD2ITZ for Saturday March 19th, 11:00 a.m. at Putnam Valley Free Library, 30 Oscawana Lake Road in Putnam Valley. This will be PCARA's first test session under the auspices of Laurel VEC (https://www.laurelvec.com/). Candidates must contact Laurel Team Leader Dave Harper KF2BD, (914) 432-2639, daveharper'at'vivaldi.net.

-NM9J

DMR / P25 scanner for the Manor

Uniden BCD996P2 review

Westchester goes digital

Last summer, Westchester County made a significant change to its mobile radio systems. As explained in "Digital scanner for the Manor" (*PCARA Update,* October 2021) the County Police "Channel 1/2" on 155.31 MHz was changed from analog FM to **P25 Phase 1** digital voice. In order to receive the new transmissions, I had to revive an old Radio Shack PRO-197 scanner. Meanwhile the County was planning to convert its Motorola Type-II UHF FM trunked system to **P25 Phase 2** digital voice.

On February 2, 2022 I was informed by Greg KB2CQE that the County's trunked system had indeed been changed over to digital. The system provides inter-communication between Westchester's Emergency Communications Center in Valhalla, known as "60 Control", fire departments, ambulance corps, hospitals, police and Bee-Line buses.

One of the new sites for Westchester County's P25 Phase 2 radio system is at the WHUD tower.

Scanner shortage

In the previous article, I mentioned that monitoring P25 Phase 2 transmissions would require a new scanner. Suitable models from Uniden and Whistler were expensive, with supply chain issues making most of them unavailable. Sigh!

When the County's trunked system went digital in February I had another look at scanner prices. Uniden models supporting digital voice were back in stock, with some price changes.

Portables	
Uniden BCD325P2	$370
Uniden BCD436HP	$490
Uniden SDS100	$650
Base/mobile	
Uniden BCD996P2	$400
Uniden HomePatrol-2	$460
Uniden BCD536HP	$500
Uniden SDS200	$700

High prices were still a barrier, until I noticed a special offer on the Uniden BCD996P2, reduced to $370.00. The BCD996P2 is a P25 Phase 1 and 2 capable scanner, with additional modes available as optional extras. Encouraged by Greg KB2CQE, I placed an order and two days later a dark blue truck from a well-known vendor delivered the goods.

Unpacking the bits

Inside the box was the BCD996P2 itself, mobile mounting bracket, mounting hardware, switched mode power supply (13.8V at 750mA), 12V cigar lighter cord, USB-A to mini-USB programming cable, BNC telescopic antenna and three-wire harness for mobile installation. The radio label states "Made in Vietnam".

Contents of the Uniden BCD996P2 scanner box.

Also in the box was a 108 page "Owner's Manual" — the text closely resembles the "Easier to Read BCD996P2/XT Manual" from 'Mark's Scanners' web site, http://new.marksscanners.com/ — this site is well worth a visit if you need operating instructions for *any* scanner.

First impressions

The BCD996P2 is very similar to my old Uniden BCT15X analog scanner. The front panel is almost identical, with just a few button changes and a mini-USB socket in place of the 4-pin serial connector. At switch-on, the backlight LEDs for the front-panel buttons and the LCD display are all colored white instead of red. The 64 × 128 dot matrix display shows similar information to the BCT15X. At first switch on, model number and "Copyright 2015" were displayed, followed by "Scan Mode – Nothing to Scan".

Uniden BCD996P2 scanner after first switch-on.

The rear panel has a BNC antenna socket and 3.5mm jacks for external speaker and "REC OUT."

The BCD996P2 and its portable companion the BCD325P2 are the *least* expensive of Uniden's digital voice scanners and lack some advanced features. The more expensive Uniden scanners can program themselves for local channels simply by entering a location's ZIP code. The internal database of national channels that supports this feature can be updated periodically from the Internet.

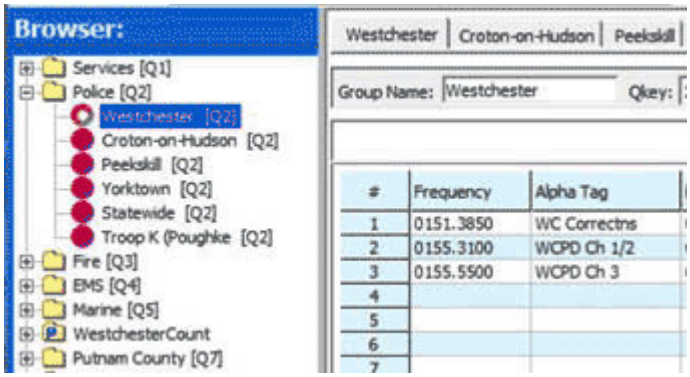
The BCD996P2 does **not** have the ZIP code feature — instead storage of memory channels has to be carried out manually using front panel controls or *via* the USB cable, with programming software installed on a PC. That was fine by me — I prefer to make my own choice of frequencies and had previous experience of third party software.

Good news

I have had success in the past with applications from Butel Software. I checked their web site (https://www.butel.nl) and was pleasantly surprised to find Butel's ARC-XT software, previously purchased for my Uniden BCT15X, also supports the BCD996P2. The latest update, already installed on my Windows 10 notebook, included support for P25, DMR and Mototrbo™.

I connected the supplied USB cable between computer and scanner, switched the scanner on and saw the device recognized by Windows as "USB Serial Device (COM4)". Butel's ARC-XT software detected the scanner and I was able to download the data and settings configured at the factory.

As a first attempt at programming, I loaded the profile from my old BCT15X scanner into the Butel ARC-XT software. This included separate systems for 'Police', 'Fire', 'EMS', 'Westchester County Trunking' and 'Amateur'.



Memory channels from Uniden BCT15X were transferred to the BCD996P2 scanner using Butel's ARC-XT software. Each yellow folder is a "System". Each red circle is a "Group". Quick-keys are indicated by [Q1] [Q2] etc.

I uploaded this data to the new BCD996P2 and was pleased to see it begin scanning familiar frequencies. If you need to draw attention to activity on a particular channel, you can program the display backlight to change color for a short time. If you would like to see frequencies displayed, select 'Display Mode 2' using "Func" →"6". Each system can be assigned a "Quick-key" for rapid inclusion or exclusion from scanning.

Uniden Dynamic Memory

Instead of storing channels in memory banks, modern scanners employ a more efficient design that makes better use of available storage. Each "**Profile**" created by Butel's software can contain up to 500 "**Systems**" (yellow folder). Each system contains one or more "**Groups**" (red circle).

For a **conventional** system, the group contains channel details — the individual radio frequencies, alpha tags and other information such as PL tone and mode of transmission.

For **trunked** systems, the System contains one or more "**Sites**" (blue lozenges), each of which has a list of associated frequencies and possibly a DMR Color Code. The group(s) within a trunked system contain a list of **talkgroups**, with talkgroup numbers (TGID) and alpha tags listed in place of individual frequencies.

P25 Phase 1

Benefield Boulevard water tank is one of the sites for P25 Phase 1 transmissions.

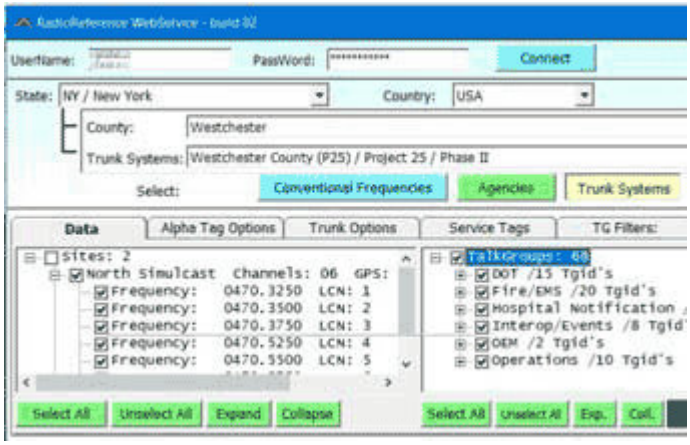
Old channel details retrieved from my BCT15X scanner still showed Westchester Police in a conventional system with analog FM mode. I edited the 'Ch 1/2' settings in Butel's software to be in line with information provided by Radio Reference for P25 Phase 1: — "Audio type": Digital, "P25 NAC": 154. Phase 1 P25 transmissions from headquarters and mobiles could then be heard. Audio quality was similar to the Radio Shack PRO-197 scanner, with some transmissions still sounding mechanical. An external speaker improved the quality.

Reception of Westchester County P25 Phase 1 transmissions on BCD996P2.

P25 Phase 2

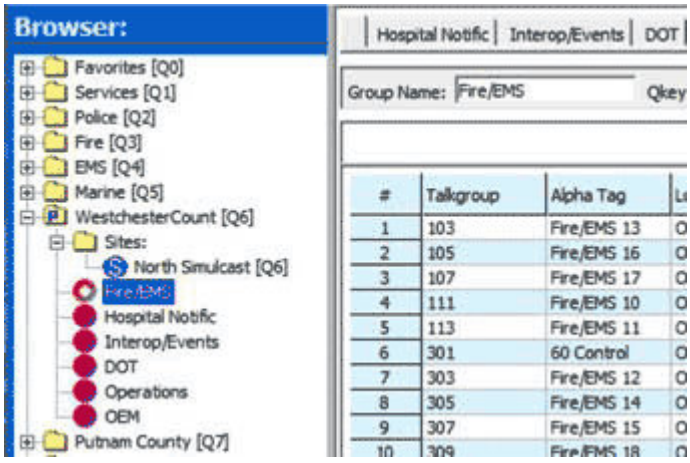
The next step was to obtain details of Westchester's new P25 Phase 2 trunking system from RadioReference.com. Data is available in tabular format from the following link: https://www.radioreference.com/apps/db/?sid=11717 . It is also possible to download details directly into programming software, though this requires a subscription to RadioReference.

The procedure for Internet import into Butel's software is to specify **State** and **County**, then click "**Trunk Systems**" and from the drop-down list select "Westchester County (P25) / Project 25/ Phase 2". This results in two sites, "North Simulcast" and "South Simulcast" plus six sets of talkgroups. I selected "North Simulcast" and — for an initial test — all of the listed talkgroups.



Importing details for Westchester County's P25 Phase 2 trunking system from RadioReference into ARC-XT.

This generated a new "System" labeled "WestchesterCount" with a single site, labeled "North Simulcast". Four UHF control frequencies are associated with this "site". In addition, six groups were created labeled "DOT", "Fire/EMS", "Hospital Notification", Interop Events", "Operations" and "OEM". Each of these groups contains a listing of the relevant talkgroups.



Importing details of Westchester's P25 Phase 2 system into ARC-XT software, results in one site (blue 'S' lozenge) and six groups (red circles) containing sets of talkgroups. Contents of the "Fire/EMS" group are shown at right.

For example, the "Fire/EMS" group contains talkgroup "111" tagged "Fire/EMS 10" and talkgroup "107" tagged "Fire/EMS 17". These two talkgroups cover the Fire Departments and Ambulance Corps in our part of Northern Westchester. Fire/EMS 10 includes Croton, Montrose, Peekskill and Verplanck. Fire/EMS 17 includes Mohegan Lake, Yorktown, Continental Village and Millwood.

P25 Phase 2 reception

As soon as the system and talkgroups were uploaded to the BCD996P2 scanner, reception of the County's new trunking system began. I could hear 60 Control dispatching fire departments and ambulances. Audio quality was similar to the Westchester Police dispatches — 60 Control sounded reasonable, but some of the mobiles could sound mechanical and more difficult to copy. (Some Fire/EMS dispatching still takes place on analog FM — 46.26 MHz low-band and local UHF frequencies.)

Reception of Westchester County P25 Phase 2 transmissions for Talkgroup 105, Fire/EMS 16 (Armonk, Bedford Hills, Chappaqua, Katonah, Mt Kisco).

The "DOT" group for Westchester County's Bus system was also working — though bus dispatch is not the most exciting of activity to monitor.

I could see the "Hospital Notification" group activating from time to time, including the talkgroup for Hudson Valley Hospital — but no audio was being received. This was to be expected — Westchester County's talkgroups for ambulances to inform hospitals about incoming patients are now *encrypted* and cannot be decoded on a consumer device.

The key to DMR

Uniden's digital voice scanners are capable of receiving additional modes, including **DMR** (Digital Mobile Radio), **NXDN** (Next Generation Digital Narrowband, developed by Icom and Kenwood) and **ProVoice** (Harris digital voice). Each of these upgrades has to be paid for then installed.

With several amateur radio DMR repeaters in our area, I decided to obtain the DMR upgrade. This involved a visit to Uniden's web site, https://my.uniden.com/, registering the scanner's serial number, choosing the desired upgrade then paying a $60.00 fee. Uniden's web site generated a long, hexadecimal key which has

to be entered using the scanner's front panel controls. After a short delay the scanner restarted with DMR capabilities enabled.

DMR essentials

DMR (Digital Mobile Radio) is an international standard defined by the European Telecommunications Standards Institute (ETSI). The technology is somewhat similar to P25 Phase 2 mobiles, with two-slot TDMA (time division multiple access) squeezing two voice channels into 12½ kHz of RF spectrum. Each time slot is 30 milliseconds long. The modulation system employs four-state frequency shift keying. In 2005 commercial DMR manufacturers agreed to use the Digital Voice Systems Inc. (DVSI) half rate AMBE+2™ vocoder to ensure interoperability. Total throughput is 9600 bps — after overhead this allows 3600 bps for voice/data in each time slot. (For more details about DVSI vocoders and P25 Phase 2 see *PCUD* October 2021, p8-11.)

Important information for monitoring of DMR transmissions includes the **Time Slot** in use (TS1 or TS2) and the **Color Code** of the transmission. There is a choice of 16 Color Codes — analogous to the CTCSS or PL™ sub-audible tones that are used in analog FM to discriminate between systems with overlapping co-channel coverage. DMR also supports **talkgroups** — as used in trunked systems to support groups of different users on a limited number of frequency channels. In amateur radio, DMR talkgroups are employed to connect local, regional, national and international groups of fellow amateurs on Internet-linked repeaters.

Seeking DMR information

The printed Owner's Manual for the BCD996P2 contains *no* information about DMR. There is some helpful information on manual programming in Uniden's wiki entry "DMR and ProVoice added to BCD996P2 and BCD3225P2 scanners". (http://info.uniden.com/twiki/bin/view/UnidenMan4/DigitalMobileRadioUpgradeforBCDxxxP2)

The online help for Butel's ARC-XT software also contains *no* mention of DMR. I found useful hints on how best to program the BCD996P2 for DMR in RadioReference forums and some other sources.

Local DMR list

The following sites proved helpful in assembling a list of DMR repeaters around northern Westchester. :

WECA: https://www.weca.org/facilities

BrandMeister: https://brandmeister.network/?page=repeater&id=311438

NY Metro DMR Repeater Network (aka Bronx-TRBO): http://k2hr.com/Metro%20DMR.html

NJ-Trbo: http://cbridge.nj-trbo.org/NJTrbo/

W2LGB: https://w2lgb.net/radio-repeater-nformation

Call	Location	Freq MHz	Off set	Color Code	Time slot	Talkgroups
W2ECA	Grasslands	438.7125	-5	CC 14	TS1	1, 3136, 91, 31515 (TS2 - 311438)
NY4Z	Jefferson Valley	448.9250	-5	CC 3	TS1	444
NY4Z	Mahopac	448.1250	-5	CC 9	TS1	444, 9
NY4Z	Mahopac	145.3900	-0.6	CC 1	TS1	444
NY4Z	Briarcliff Manor	443.6000	+5	CC 1	TS1	444
NY4Z	Mt Beacon	441.4500	+5	CC 7	TS1	9, 31361; (TS2 - 444)
NY4Z	White Plains	442.10625	+5	CC 3	TS1	444
W2LGB	Thiells	443.2000	+5	CC 1	TS1	9, 31361; (TS2 - 444) etc.
N2JTI	Orangeb'rg	444.000	+5	CC 1	TS1	3; (TS2 - 2) etc.

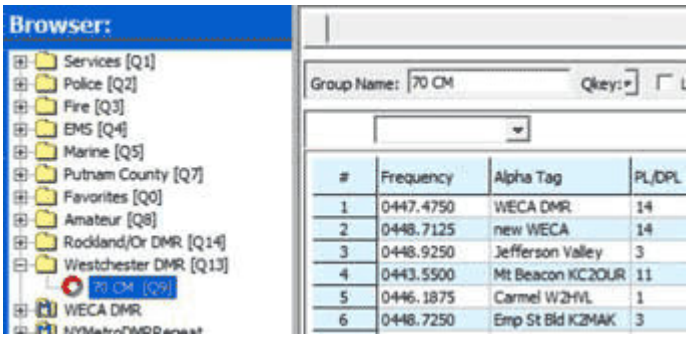
DMR simplex frequencies: 441.000, 446.500, 446.075, 433.450; 145.790, 145.510 MHz. All are CC 1, TS 1, TG 99.

(The WECA UHF DMR repeater changed frequency from 447.475 MHz to 438.7125 -5 MHz on February 14, 2022. 447.475 -5 MHz has reverted to analog FM.)

Programming the scanner

There are two ways to program amateur DMR repeaters into the BCD996P2. If you have limited information, you can add repeaters to a **Conventional System**. The system can have one or more Groups containing Frequency and Alpha tags for each repeater. Set Audio type to "Digital only" — color code can be entered if known (1-16) or enter "Search".

In Butel's ARC-XT software, channel details for a Conventional System are entered just as for an FM channel, except the PL/DPL column is used to enter Color Code or 'Search'. The AudioType column is set to 'Digital'.

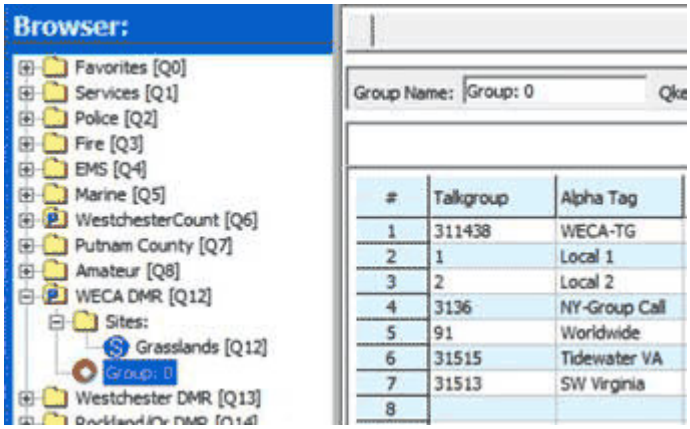


Conventional system contains frequencies and alpha tags for six DMR repeaters. Color code in the PL/DPL column.

The second way to program an amateur DMR system can be used when Talk Groups are known and possibly shared across multiple repeater sites. From the front panel, the new system is set up as "**DMR/MotoTRBO**" with the choice "One Freq Trunk". One or more sites can then be added, with repeater frequency and color code specified for each site. A group is then added to the system containing the list of talkgroup ID numbers (TGID), alpha tags and time slots.

In Butel's ARC-XT software, the new system should be given a system type of "DMR". One or more sites are

then added, each of which has frequency and color code defined on the "Trunk Frequencies" tab. The group which is set up as part of this system can then have talkgroup ID numbers, and alpha tags added. Each talkgroup can be assigned to "DMR Tslot" 1, 2 or ANY.



DMR repeater with multiple talkgroups is set up in Butel ARC-XT software as a system with type "DMR". The 'Site' (blue 'S' lozenge) holds the frequency and color code. The 'Group' (red circle) contains talkgroups and time slots.

This is quite a lot of work, especially if systems are programmed from the front panel. Some amateur and non-amateur DMR systems can be imported from RadioReference into the scanner's programming software. For example in Butel's ARC-XT if you specify Rockland County, Trunked Systems then the "NJ-Trbo Linked Amateur Radio Network" system can be imported, while for Westchester and Putnam the "NY Metro DMR Repeater Network" is available. These are imported as system type "MotoTrbo" with LCNs (logical channel numbers) specified. For amateur radio repeaters, my experience using this approach was less successful than entering the data manually with system type "DMR".

Is it working?

Once the scanner is programmed with one or more amateur DMR systems, it is time to start scanning and see what appears. This might be a lonely experience as amateur activity outside drive-time can be thin. You may see the signal strength bars light up, but without hearing any voice traffic — this is the repeater "beaconing" to assist any roaming mobiles to find a suitably strong signal.

The best opportunity to assess reception occurs when there is a net active — for example the WECA DMR repeater has nets on Saturdays and Thursday evenings. Don't rely on the scanner's telescopic antenna — better results will be obtained with an external antenna mounted as high as possible.

Audio quality can be a mixed bag. Some voices are loud and clear, others can be distorted. This also applies to amateurs using a Multi-Mode Digital Voice Modem (MMDVM) or Hotspot connected via the Internet to a DMR network. Monitoring bit error rate (BER) on the scanner display (Function → VOL) and the source/loss rate on the network's LastHeard or NetWatch page can be enlightening. See for example: https://brandmeister.network/?page=lh&ContextID=^311438$ *(WECA)* or http://www.netwatch.nydmr.net/ *(New York Metro)*.

Reception of Larry W2LGB's DMR repeater in Thiells. Note error rate '7' lower left.

"The two most important pieces of info you can use are the RSSI value and Packet Loss (loss rate) columns. Values of -115 to -127 dBm are considered poor to bad for inbound signals to the repeater. Having a poor signal and a large percentage of loss rate, means you may 'R2D2' or not get in at all." *(- K2ACY Atlantic City)*.

Conclusions

If you can afford the price, Uniden's BCD996P2 provides a small, efficient package for monitoring analog AM, FM, P25 Phase 1, P25 Phase 2 *and* DMR transmissions in our local area. The unit is "amateur friendly", with custom searches pre-programmed for 28-29.7, 50-54, 144-148 and 420-450 MHz.

You may be disappointed with the audio quality of P25 and DMR transmissions compared with good old analog FM — as developed by Howard Armstrong 90 years ago. My suggestion — persevere with listening to DMR reception. Radio amateurs have been adapting to newer, more narrow modes of transmission for over a century — from spark to CW, from AM to SSB and from RTTY to FT8. Most progress consists of two steps forward and one step back.

- NM9J

Icom IC-705 in 3D

Brought to breakfast

During PCARA Breakfast at Uncle Giuseppe's on Saturday February 19, Lew KD2IBT brought in his Icom IC-705. This QRP transceiver covers HF, bands and 50/144/430 MHz, with support for SSB, CW, AM and FM plus D-STAR digital voice mode.

Lew KD2IBT brought his Icom IC-705 transceiver to PCARA Breakfast at Uncle Giuseppe's.

Lew's transceiver was mounted in a combined carry frame and tilt stand with removable screen cover. The entire assembly had been 3D-printed, with Lew's call sign 'engraved' into the screen cover.

Lew's call sign 'intaglio' printed into the frame's screen cover.

Frame came from Croton

Origin of the carry frame came as a surprise. It had been supplied as a self-assembly kit by "HamGear 3D", run by our very own **Mike N2HTT**.

According to Mike's site, the outer frame is designed to protect the front panel of the IC-705 while incorporating a carry handle. The base is tilted back 14 degrees for a convenient viewing angle. The kit includes a cover to protect the transceiver's color touchscreen during transport or storage. Each print-to-order self-assembly kit can be supplied in black, olive green, orange or red, using PLA2 poly(lactic acid) thermoplastic.

Full details are available on the Hamgear3D web site: https://hamgear3d.com/ where the IC-705 transceiver is pictured with its frequency set to "146.670.00 PCARA 2m". Purchase is possible through the Etsy web site at: https://www.etsy.com/shop/HamGear3d .

FT-991A accessories

My Yaesu FT-991A transceiver was purchased 3½ years ago. A mini-review appeared in the October 2018 *PCARA Update*. I concluded that this "DC-to-light" multi-mode transceiver was a good replacement for the Icom IC-706MKIIg.

Since then I added a few accessories to improve performance. Remember my usual advice… if you purchase an item of radio equipment, be sure to purchase matching accessories *before* the model becomes obsolete.

MH-36 microphone

The original press-to-talk microphone supplied with the FT-991A is the MH-31A8J. This inexpensive dynamic microphone with RJ-45 modular 8-pin connector is included with various Yaesu transceivers including the FT-818 and FT-450D.

Some reviews of the standard MH-31A8J dynamic microphone describe the audio quality as "muddy", with a Tone switch on the reverse side to reduce bass response. I prefer an electret microphone which is likely to have a flatter frequency response.

MH-36E8J DTMF microphone.

Yaesu specifies the MH-36E8J as a DTMF (dual-tone multi-frequency) microphone which is compatible with the FT-991 / FT-991A and several other transceivers. The 16-button keypad on the front face can transmit touch-tones in order to control a re-

peater or select an EchoLink node. The microphone element is an electret-type.

The MH-36E8J has "Dwn" and "Up" buttons for VFO stepping on its top surface. There is no dedicated "Fast" button, but the additional "A" and "B" buttons on the front face can perform this function.

The only downside to the MH-36E8J is susceptibility to RF feedback. This can happen if an antenna is close to the transceiver or there is RF on the outer conductor of a coaxial feeder. Good grounding can help.

External tuner

The FT-991A has a built-in automatic antenna tuner. This works well for bands from 160 to 6 meters (1.8 – 50 MHz), but is only effective for VSWRs less than 3:1 on the HF bands and less than 2:1 on 6 meters. For higher SWRs the automatic tuner will not be able to find a match.

If your antenna system falls into this hole, an external antenna tuner can be helpful. There are automatic and manual tuners that can cope with VSWRs up to 10:1 — though losses in the coaxial cable can become unacceptable at those higher ratios.

My suggestion — choose an external tuner with built-in antenna switching and the option to select a 50Ω dummy load for transmitter testing. For example, check out the MFJ-948 or MFJ-949E.

FH-2 remote control

Many controls on the FT-991A are reached through the color touch-screen. This is fine for parameters that only require occasional adjustment, such as microphone gain or preamp on/off. But there are circumstances where a frequently-used control conflicts with viewing essential information on the main display. One example is selection of the built-in voice and CW memories for contesting. In order to play out one of the five available memories, it is necessary to bring up soft buttons [CH1] – [CH5] on the touch screen, then repeatedly press the appropriate button.

[CH1] - [CH5] soft keys displayed in order to send from memory.

Yaesu has a solution with their FH-2 Remote Control Keypad. This is a 12-button pad with wired connection to the REM/ALC jack on the rear panel of the FT-991A. Five buttons are available to select a particular memory. The remaining buttons are used for setting up memories and to decrement the contest counter.


FH-2 keypad.

GPS receiver

The FT-991A has a built-in clock that is permanently displayed top-right on the color touch screen. This is a great feature for logging, but unfortunately the clock in my FT-991A drifts badly with time, becoming wildly wrong after a few weeks. You could reset the clock by holding down the "Menu/Setup" button – but this soon grows old.

FT-991A UTC clock.

The FT-991A has provision for connecting an external GPS (Global Positioning System) receiver. A GPS device can provide accurate time and location. Yaesu's System Fusion (C4FM) digital voice mode can exchange position information.

I selected a Garmin "GPS18x PC" external GPS receiver, recommended by several FT-991A users. This Garmin receiver is intended for mobile use and takes the form of a round "hockey puck" with powerful magnet for roof mounting, a cigar-lighter connector for 12V supply and a female DE-9 (DB-9) connector for the serial connection. The nine-pin connector plugs into the GPS/CAT socket on the rear panel of the FT-991A. There are transceiver menu settings to select GPS or CAT computer control, RS-232 speed and time-out.


Garmin 'GPS18x PC' external GPS receiver for connection to an (old) notebook PC.

In my case all the FT-991A menu defaults were correct for the Garmin receiver, which began operating as soon as it was plugged in. A green satellite icon appears on the display to confirm reception, with the accurate time shown just above. Location data in the form of latitude and longitude are also transferred. I found GPS reception was satisfactory with the Garmin hockey puck magnetically attached to the top of the FT-991A steel case.

Satisfactory GPS reception is indicated by a green satellite icon with accurate time above.

In case you were worried about losing CAT (Computer Aided Transceiver) control while the GPS receiver is connected, the FT-991A has a USB Type-B connector on the rear panel that carries both CAT control and built-in sound-card signals for an attached computer.

- NM9J

Lithium-ion and water

On February 16 2022 fire broke out on the Panama-registered vehicle carrier *Felicity Ace*, located 90 miles southwest of the Azores. The vessel was carrying 3,965 vehicles from Emden, Germany to Davisville, Rhode Island, including Volkswagen, Porsche, Lamborghini and Bentley models. Some of the autos were rare, luxury types selling for half a million dollars. Total value of the cargo was estimated at $438 million.

Cargo ship "Felicity Ace" on fire in mid-Atlantic. [Credit: Portuguese Navy.]

The crew of the Felicity Ace abandoned ship and were rescued from the Atlantic Ocean. Some cars on the vessel were electric vehicles with lithium-ion batteries and the vessel was aflame from stem to stern. It is not clear whether EV batteries were the source of the fire, but they were certainly burning subsequently. The captain of the nearby port of Faial said that batteries in the cargo were keeping the fire alive. Water could not be used to extinguish this type of blaze and specialized equipment would be needed to put the fire out.

By February 25th the fire was reported to be extinguished. A salvage team had boarded the vessel by helicopter and started tow operations to a safe location off the Azores.

Apart from contributing to the shortage of new vehicles, the blaze may also trigger an increase in marine insurance rates. The hazards attached to lithium-ion batteries should be born in mind when you are recharging your handi-talkie or mobile phone, while insurance rates could affect the cost of your next transceiver.

Mazda mystery

Owners of Mazda vehicles in the Seattle, WA area have reported strange happenings in their 2014-2017 cars, when factory-equipped with an HD-Radio receiver. Their car radios lock up or constantly reboot then become locked on 94.9 MHz, the frequency of KUOW-FM, Seattle's NPR station. Mazda dealers in the area have been swamped with complaints. KUOW released the following statement:

2014 Mazda 3 Hatchback.

"KUOW is aware of an apparent issue between our signal and some Mazda infotainment systems, causing radios to reboot when they connect to KUOW's 94.9 FM signal. We have been in contact with Xperi, the company who owns the technology behind HD Radio, and have given them complete access to our transmitters to investigate what is causing this issue. Our operations team is doing everything they can to support them in finding a quick resolution. We also appreciate the assistance of listeners who helped alert KUOW to this issue and have provided additional information to aid the investigation."

KUOW later said that the HD Radio system pulls images from NPR or uses the KUOW logo when there is nothing available from NPR to use. The images are included in the broadcast then displayed on-screen to accompany the radio program. HD Radio developer Xperi said there was a formatting issue with the transmitted data.

One suggestion from Mazda is that image files were being transmitted without the correct file extension. This may have been enough to corrupt the computer code in the vehicles' infotainment systems.

Mazda 3 Infotainment system screen.

Mazda states that a new Connectivity Master Unit (CMU) will solve the problem and, despite supply chain shortages, as of late February a new batch of CMUs had just started to arrive at Seattle area dealerships to allow repairs.

Peekskill / Cortlandt Amateur Radio Association

Mail: PCARA, PO Box 146, Crompond, NY 10517
E-Mail: mail 'at' pcara.org
Web site: http://www.pcara.org
PCARA on Facebook: http://facebook.com/pcarahamradio
***PCARA Update* Editor:** Malcolm Pritchard, NM9J
E-mail: NM9J 'at' arrl.net
Newsletter contributions are always very welcome!
Archive: http://nm9j.com/pcara/newslett.htm

PCARA Information

PCARA is a **Non-Profit Community Service Organization**. PCARA meetings take place every month (apart from July/August break). See http://www.pcara.org for current details.

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

Masks and Social Distancing may be required.
Mon Feb 28: "Magic of Amateur Radio" by Todd N2MUZ, 7:00 p.m. Putnam Valley Lib., 30 Oscawana Lake Rd. Link.
Sat Mar 5: Bring and Buy Auction, 9:00 a.m. CUE Community Room, Cortlandt Town Center.
Sat Mar 19: PCARA Breakfast, 9:00 a.m., Uncle Giuseppe's, 380 Downing Drive, Yorktown Heights.
Sat Mar 19: PCARA V.E. Test Session, 11:00 a.m. Putnam Valley Library, 30 Oscawana Lake Rd, Put Valley. See below.

Hamfests

Check with organizers before leaving.
Sat Mar 12: Cherryville Repeater Association Hamfest, . North Hunterdon Regional High School, 1445 Route 31 Clinton NJ. 8:00 a.m.
Sat Apr 2: NJARC Spring Hamfest, Parsippany PAL Building, 33 Baldwin Road, Parsippany, NJ. 8:00 a.m.

VE Test Sessions

Check with the contact before leaving.
Mar 5, 12, 19, 26: NYC-Westchester ARC, 43 Hart Ave, Yonkers NY. 12:00 noon. Must contact VE Lester Tirado, k2ltm'at'aol.com.
Mar 10: WECA, Westchester County Fire Training Center, 4 Dana Rd, Room 3, Valhalla NY. 7:00 pm. Must contact VE: Stanley Rothman, (914) 831-3258, Email: wa2nrv'at'weca.org.
Mar 18: Orange County ARC, Munger Cottage, 183 Main Street, Cornwall NY. 6:00 p.m. Must contact Joseph J. DeLorenzo, (845) 534-3146, w2bcc'at'arrl.net
Mar 19: PCARA, Putnam Valley Library, 30 Oscawana Lake Rd. Putnam Valley. 11:00 a.m. Must contact: daveharper'at'vivaldi.net.

Peekskill / Cortlandt Amateur Radio Association Inc.
PO Box 146
Crompond, NY 10517