PCARA Update

Always ready

The 2023 Annual **PCARA Bring and Buy Auction** was held on Sunday January 8, 2023 at 3:00 p.m. at the Town of Cortlandt CUE Room in the Cortlandt Town Center. We had 21 in attendance and some really great deals were to be had. *Very* generous members and attendees donated over $150.00 to the club's coffer! Thank you!

PCARA members check items on offer at the annual Bring & Buy Auction, held at the Cortlandt Town Center on January 8th.

The January 21, 2023 **PCARA Breakfast** was held at the NEW Uncle Giuseppe's Marketplace in Yorktown Heights, NY, and a dozen PCARA members stopped by to share the experience. We were not the only large group present at Uncle Giuseppe's that morning. Members from U.S. Coast Guard Auxiliary Flotilla 06-04 – Verplanck were having a breakfast of their own. We have run into members from the Flotilla previously at the former location of Uncle Giuseppe's, and there was some discussion of our groups getting together to share common interests in communications. Did I just hear someone say "*maritime mobile*?"

The PCARA V.E. Test Session scheduled for Wednesday January 25 at Putnam|Northern Westchester BOCES had to be canceled because of a weather-related early closing. There is another Test Session coming up in February, see below.

Please mark your calendars with the following up-coming events:

PCARA Breakfast on January 21 at Uncle Giuseppe's — with U.S. Coast Guard Auxiliary members ready nearby.

- Saturday February 4, 2023 at 10:00 a..m: PCARA Monthly **Membership Meeting** and **Presentation** on "An Introduction to 3D Printing – a Ham Radio Perspective" at the Putnam Valley Free Library by Mike N2HTT. The presentation will also be available via Zoom – details on page 2.
- Saturday February 4, 2023, at 11:30 a.m: PCARA **VE Test Session** – Laurel VEC. Candidates must contact Dave KF2BD at daveharper'at'vivaldi.net to pre-register.
- Saturday February 18, 2023 at 9:00 a.m.: **PCARA Breakfast** at the NEW Uncle Giuseppe's Marketplace in Yorktown Heights, NY.

Out next regularly scheduled PCARA Monthly Membership Meeting is on February 4th at 3:00 pm at Putnam Valley Library. Please join us! I look forward to seeing each of you there.

- 73 de Greg, KB2CQE

Contents

PCARA Board

President:
   Greg Appleyard, KB2CQE; kb2cqe 'at' arrl.net
Vice President:
   Bob Tarsio, N2CBH; bob 'at' broadcast-devices.com
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   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.

February meeting

February's **monthly meeting** will take place at 10:00 a.m. on Saturday February 4th at the Putnam Valley Library when Mike N2HTT will present "An Introduction to 3D Printing, a Ham Radio Perspective." Mike has merged his extensive experience in both amateur radio and 3D printing. He designs and fabricates 3D-printed transceiver accessories and has shipped hundreds around the world. For more information, check out his HamGear3d Etsy shop: https://www.etsy.com/shop/HamGear3d

Those wishing to attend in person or remotely *via* Zoom are asked to register at Putnam Valley Library's web site using https://bit.ly/3WEAzF7. (**Note** the lower-case 'z')
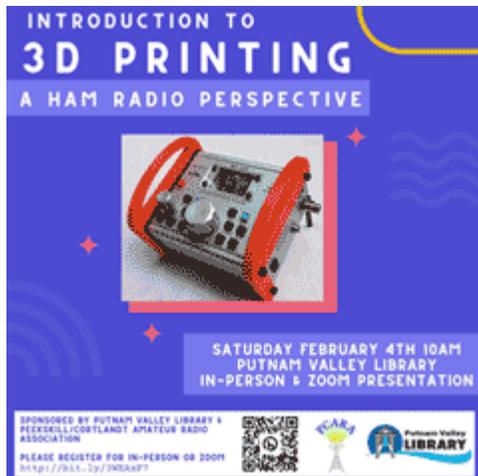
The presentation will be followed by a **V.E. Test Session** starting at 11:30 a.m. Candidates for this Laurel VEC session must contact Dave Harper KF2BD beforehand using: daveharper'at'vivaldi.net.

Posters courtesy of Lou KD2ITZ.

Prize antenna

In early December Rob AD2CT found out that he had won a Buddipole "Buddistick Pro" antenna, awarded by "Ham Radio Crash Course." You can see Rob's prize being announced at 1 hr 02 minutes into the following video: https://www.youtube.com/watch?v=VszKuj1R_As .

Ham Radio Crash Course (HRCC) evolved from a YouTube Channel run by Josh Nass KI6NAZ into a growing community of radio enthusiasts who are excited by the hobby and by helping others to join in. Web site is http://hamradiocrashcourse.com/, YouTube channel is : https://www.youtube.com/hoshnasi.

Rob AD2CT is pictured with the Buddipole "Buddistick" in its carry-case. [AD2CT pic.]

The Buddistick Pro is a portable vertical antenna covering 40 meters to 6 meters. The Cordura bag contains a collapsible tripod to support the feed point. The vertical antenna that attaches to the feed point includes a tapped inductor and telescopic whip that need adjustment for each band. A video by Josh KI6NAZ shows: "How To Setup The Buddistick Pro and Tune it up!" — https://www.youtube.com/watch?v=7aqKQ-_8jJI .

Adventures in DXing
- N2KZ

Conversational Morse

There must be a million ways to learn Morse Code. I have heard of some doozies! Sing Morse Code. Code by hypnosis. Learn while you sleep. Incorporate written Morse into pictures. Crazy charts showing alliances between letters. Nutty associations: "F - Fetch a fire man" Huh? My favorite: Morse Code sent using heavy metal guitars! https://youtu.be/qaHgdFH3jgs. You can't write this stuff!

There are an equal amount of classic Morse Code *excuses.* Tell me all about the reasons you *can't* learn Morse Code. My ears can't hear the tones. It makes me nervous. I have reached a plateau. My hands are arthritic. I can't concentrate that long. The clicking disturbs me greatly. I had a dream about aliens that spoke Morse Code. It scares my cat! Don't fret. Karl is here to ease your pain!

Morse scares your cat?

I have been using and teaching Morse Code for over twenty years. I have met hundreds of people through Morse. I have seen some amazing feats! I once worked a ham on 80 meter CW who was deaf and blind. He loved Morse Code. Right up front, he asked me to send slowly and *deliberately*. I found out why! He would rest his fingers against a speaker cone to *feel* the code come in. Days later, I received a grey QSL postcard from him that had no stamp. (His wife had written the card.) He told me that handicapped people can send mail using a special frank on their letters instead of a stamp. Amazing!

Sending **QLF** is supposed to be a funny Q-sign that means "send with your Left Foot." It kiddingly says

Elephants – PSE QLF!

"Your sending is horrible!" Well...I worked a ham who had arthritis in his right hand, so he learned how to send with his left hand. When his left hand fell to arthritis, he was determined to keep sending. He mounted a straight key to a piece of plywood he placed on his floor and learned to send with his right big toe! He actually sounded pretty good, too. I never found out if he could send with his left toe!

I used to have a 10 meter transceiver in my car and I would send Morse with a straight key on a wooden board sitting on my passenger seat. It was more comfortable than you would ever believe! I worked the world commuting from Manhattan to my home. One afternoon, one of the wires to the key broke off. I actually quickly ended the QSO by touching the broken wire to the key base to finish my message. This is not a recommended method of operation!

The moral of these stories is simple: when it comes to Morse Code, there is very little that should stop you! I have a great friend that I met when he asked me to tutor him in Morse as part of his rehabilitation from a stroke. He did very, very well and was so grateful for the attention. I can tell you this. You can summarize learning Morse in one single word: PRACTICE!
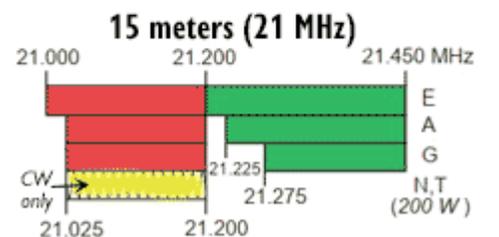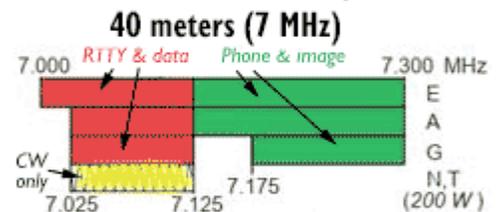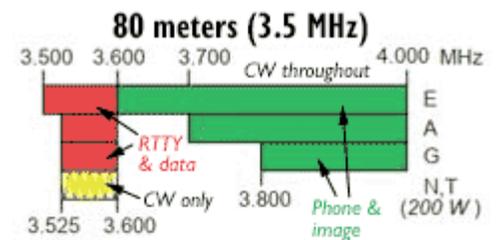
Why do you PRACTICE? With just a basic Technician license, you can get on the air on HF (shortwave) and operate with 200 big watts with no antenna restrictions. No joke. You can work the world right from your shack! The CW frequency allocations for Technicians are just as powerful: (80 meters) 3525 to 3600 kHz, (40 meters) 7025 to 7125 and (15 meters) 21025 to 21200 kHz. Don't you want to try? Rock on!

Morse is simplistic. It is just dits and dahs. No aural modulation or computer interfacing required. Use a key, a bug or a paddle and make your signal go on and off. That's it! The robust nature of

Novice/Tech CW allocations (yellow tint).

this Morse is just amazing. With little complexity, you can send code over the air with tiny amounts of power and be heard around the world. Morse defies distortion, noise, interference and fading. Error correction is built in. Miss a letter or two and you can still retrieve the overall message. Get the message? You bet!

Conversational Morse

When I teach and tutor friends who want to learn code, I take a somewhat different philosophy than most. My approach is logical. A very basic QSO is a simplistic game of fill in the blanks where you look for key words: the other person's call sign, name, location and possibly the name of their rig and type of antenna.

An RST signal report is usually sent as well but a simple **5 N N** (for 5 9 9 — a perfect signal) is quite acceptable.

Quite frankly, all you really need to copy is their call sign and their name. If you quickly look up their call sign on QRZ.com, you might be able to fake that, too! If your conversation continues a little longer than a basic 'give the basics then hit and run' QSO, you may be called upon to send your rig and antenna information and possibly a weather summary about your QTH: 'It is sunny and 55 degrees.' With a little practice, you could handle that too!

The core of my syllabus is built on learning to hear the information that makes your QSO unique. Full sentences are not required. Using standardized shortcuts is always a big help. Two single numbers — *73* — equate to 'best wishes.' My location becomes *QTH.* Is it cryptic?

73 No! It's in code! Listen for call signs, operator names, locations and possibly rigs and antenna types and a weather report. You are done! This is what you focus on. This is what you drill. This is how you build your confidence and enjoy success. QSL?

When you are a brand new beginner, you don't really have to comment directly about what they have just sent you. All you have to do is eke out the items they are talking about to make a coherent reply. The specifics are secondary. Copy their call sign and maybe their name. These are the essentials for your ears to capture! Complex detailed content comes with improving your fluency through practice and experience. It can be joyful and fun. I promise!

Think of it as trying to have a conversation while attending a loud party or any other noisy location. You can reply with your information and then gracefully say 'TU es 73' - thank you and best wishes - and complete the QSO like a champ! Congratulations! You made it! Another entry in your log book!

Before you tell me that this is no attitude to take and this

Another entry in your Log Book.

is a miserable way to start learning code, try to remember your very first CW QSOs. Didn't you fight your way through like this when you began to try to receive code? I know I did!

When I took my first 5 words per minute code test I scribbled down many smaller words but found myself just a word away from passing the code test! My examiner told me to look very carefully at what I had copied. I looked at K_NW__D over and over trying to
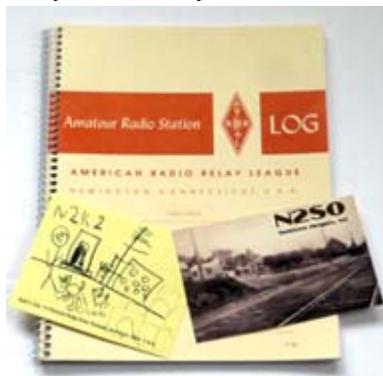
understand the message. It dawned on me! The broken word was *Kenwood*! I passed! I earned my CSCE! (Certificate of Successful Completion of Examination). I earned code privileges! I was now a Technician Plus!

The First Steps

Students starting from the very, very beginning take baby steps. I insist that graphical Morse charts with dark black dots and dashes are strictly prohibited. You can use a cheat sheet but the code equivalents must be written in phonetics not graphics. You are listening to Morse like any other language. You are not a computer attempting to make coherence from code. You are a living and breathing human being with ears!

In time, you begin to hear distinct letters and then full words and phrases. You immediately recognize **di-di-dah-dit** as the letter **F** and so on. I send one letter at a time and you tell me what letter it is. This is a very important step! *You are becoming a good listener!*

When I start seeing you've gained a little confidence in identifying letters, we advance to people's names and rig types. Let's try easy names like **E D** and **A L** — and — the big four manufacturers that I like to call **I KEY!** *I*com, *K*enwood, *E*lecraft and *Y*aesu. (These are the very first whole words I will send to students.) One wonderful rig name to copy is **Ten Tec.** It is very simple in content and has a distinct sound and rhythm to it! It's easy to remember and may become the first words you understand without spelling them out!

These lessons are peppered with more letter and number drills but in a very sneaky way. I send them as **v-e-r-y s-l-o-w** call signs! Let me also share this insider tip: When you are used to sending and listening to code at 25 words per minute, shifting gears down to 3 words per minute takes a lot of care and concentration! Boy! Does it sound different!

From the start of your schooling, you really should listen to each character as if it were sent at 15 words per minute. The timbre of the sound of each letter of the alphabet will always be the same but we leave a good pause between each letter to let you consider and think about what each one is. This is called the *Koch method.* Learning the fast sound of each letter can really accelerate your studies. You don't have to learn how a letter sounds sent slowly and

Ludwig Koch's 1936 dissertation: 'Occupational Psychological Investigation of Morse Code Reception – and a new method for training radio operators.'

then learn all over again when things speed up. It just makes sense. You'll see!

I will say this over and over again: *Become a good listener!* At this point in the course, you want to lead your students to find a HF receiver (or access a SDR — Software Defined Radio — over the Internet) and start listening to real over-the-air QSOs. My initial instructions: Just try to *copy the call signs* of the two stations that are talking. That's it! Simple! The call signs will be conveniently sent several times

Become a good listener!

during the QSO exchanges so you will have a lot of chances to check if you have copied the calls just right. Then look up both operators on QRZ.com and see if what you copied makes sense. QSL?

Great places to listen for slow code are from 7025 to 7060 kHz on 40 meters and 14050 to about 14060 kHz on 20 meters. See who you can copy! It's just like you are working them yourself!

Later on, my students advance to picking out more details like the QTH and exact rig and antenna type. Becoming a good listener is great fun and really boosts your confidence when you can break the code! When you can reach out this far, you are almost ready to leave the nest and fly on your own!

The ultimate test and drill is sufficiently difficult even for seasoned DXing CW operators. *Listen* to CW code practice broadcasts from the ARRL via the power-ful signals of W1AW from Newington, Connecticut. *Send* copy you can find in written material like newspapers and magazines. In both cases, all of the words you'll handle will be complex and way beyond the content you'll hear in regular CW QSOs over the air.

Code practice comes from the W1AW station building located at ARRL HQ.

When you have confidence sending and receiving advanced content with collegiate-level vocabulary, you have earned your Master's degree in Morse!

The W1AW broadcasts are really heavy sledding for beginners but your listening muscles will grow strong and fast if you put your mind to it! Their progressive speed format gives you an instant read-out of your current speed status. See how fast you can go! Check out W1AW's latest broadcast schedule at: http://www.arrl.org/w1aw-operating-schedule.

Searching for other fun ways to build your code speed? While you are outside walking or driving, look at billboards or road signs or anything you can see and try to send all the letters in your head: "Speed Limit 25" and things like that. Any text will do! Don't forget: Listen to HF CW every chance you get. Sing CW if you want to scare people. Code can be great fun!

Another incentive: As you get comfortable sending code, your on-air conversations will grow in complexity and content. You can share your experiences and stories with lots of other people who are just like you. Occasionally, you might react to what is being sent or even laugh out loud. Consider how crazy people will think you are if they hear you listening to the dahs and dits and you are laughing! The last laugh will be on them... and only YOU will know what is being said. You can read code!

Success

All first QSOs are big leaps! You might be a little scared or apprehensive but you will get through it. This is a unique experience you only have once! Time will fly by and you will immediately earn newfound courage and confidence.

Keep going! Let's try for another one. Your logbook will grow and grow and your signals will travel far and wide. Have a nice trip. You will develop a skill you can enjoy for ever and ever. Congratulations! You are a CW operator.

A quick note about Morse Code keys: I always encourage beginners to first learn with a basic **straight key**. It is the stick shift in the world of CW. Your sending will be deliberate and accu-

rate. A straight key will allow you to cruise along with your message and then slow down to emphasize difficult content: "OP K-A-R-L QTH K-A-T-O-N-A-H N-Y. SO HW CPY?" Please remember: Using paddles, bugs and keys are an excellent way to send really, really bad code. Rapid sending devices are hard for beginners to control and require advanced skill. Stay straight!

Karl operates a straight key from Mr. Morse's porch. [N2KZ pic.]

Brevity

If you really want to polish your skills, discover how to operate like a first-class pro. Learn from the people you meet on the air! You will find the most important and meaningful QSOs you can have are with seasoned old-timers who were professional military or marine Morse operators. They handled important and essential message traffic on a daily basis using the most expedient and accurate methods possible. These guys
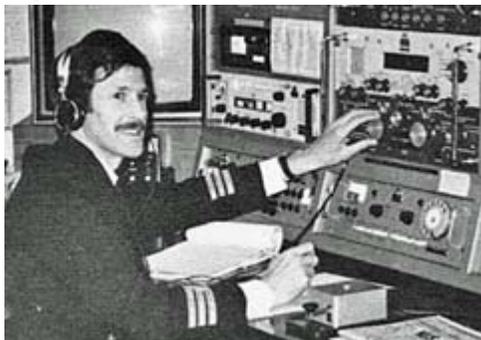

You can learn a lot from professionals like ex-marine radio operators.

really know their business and are often anxious to share their tricks to new generations of CW operators. They are my most precious moments on the air. The lessons I have learned are invaluable. Listening to all of their adventures is amazing!

The finest tip you can ever learn from them can be sent in one simple word: *brevity*. Listen to your heart and always remember this: You have a lot of complex information to send and it needs to be understood with word perfect accuracy. Time is precious and fleeting. Get the job done!

Follow the format used when sending old-fashioned telegrams. The cost of the message was based on how many words you sent. You don't want to send unneeded words that don't add meaning to the message. There are some
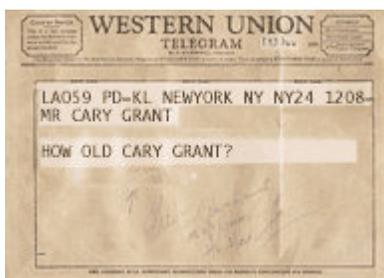
Follow the abbreviated format of old-fashioned telegrams.

terrific tips to be learned to master this skill!

You probably already know some basic shortcuts. Just using my voice, my opening statement might be: "NM9J... This is N2KZ. Thanks for your reply. Your signal is very good with nice tone. So how is your copy? Back to you. NM9J from N2KZ. Go ahead." Switch gears to Morse Code CW speak and you will get: NM9J DE N2KZ TU UR 5NN SO HW? AR NM9J DE N2KZ K. Short! Quick! Brilliant! Accurate!

Learn the jargon: There is no need to patiently send that you have a *Yaesu FT-dx1200 connected to a near vertical incidence skywave antenna*. Cut it down to the essential content: Rig? 100W to dipole. Done! End fed wire becomes EFW. End of message: AR. Back to you: BTU. Really quick 'over': BK. See you again: CUAGN — I am sure you get the idea!

Ah! But there is more! An old Navy operator taught me this trick: Give up the endless pro-sign for a period: di-dah-di-dah-di-dah. Just send an X — dah-di-di-dah instead. This was a shorthand that was used by Morse operators going back to the beginning of time. It has a very distinctive sound and does not waste time and energy. It is a fine break between thoughts and universally understood by all who know!

Another trick has turned up in the last year or so to these ears. Experience the insane madness of a big on-air contest longing for multitudes of QSOs and rare DX. The faster you can make a contact, the more stations you can log. Sending long full locations is simply unacceptable. In vogue now is sending your location simply as a two letter designate. You wouldn't send C-o-r-t-l-a-n-d-t M-a-n-o-r dah-dah-dit-dit-dah-dah *(for comma)* N-Y... but simply just N-Y. Much better!

There are lots of little techniques like this. All you need is experience and good mileage on the air! You will learn all sorts of wonderful tricks to make yourself sound polished and admirable. Go for it!

Sign Up and Register

To officially join the Morse Code CW community, part of creating your personal identity requires registration in two widely popular CW clubs. (Membership in both is now free!) The Straight Key Century Club (SKCC) can be found at: https://www.skccgroup.com. The International Morse Preservation Society (FISTS) lives at: https://www.fistsna.org. You will regularly hear CW operators request your SKCC and Fists membership numbers as they tally points for operating awards. Join the pack and maybe work towards your own certificates!

The crème de la crème of CW operator clubs is the **FOC** — The First-Class Operators Club... and they truly are! https://www.g4foc.org. When you reach a very high level of sending speed, sending accuracy and perfect traffic handling ability, you just may be nomi-

nated by a current member of the FOC for admission to the club. You then have to associate with those who already have become FOC members and — without any request or campaigning — be nominated by four other FOC members in the next six months — from at least two different continents — for future consideration. If you shine in their eyes, you may be inducted as a FOC member. Needless to say, it is quite a high honor!

Many wonderful applications are available online to improve your code proficiency to expert level. My favorites are CWCOM at https://morsepower.blogspot.com/ and the G3FON ensemble at https://www.g4fon.net. Both sites feature wonderful tools to improve the accuracy and consistency of your keying. The applications they offer are all free for download!

You'll enjoy the design of CWCOM. All you need is a Windows computer. Nothing more! If you like, you can use the down-arrow key on your keyboard as a straight key. Send your code and watch the screen. You'll be able to immediately see the accuracy of what you are sending. You can also have real-time online QSOs with other people practicing their code. No license is needed here! You are not on the air. You are on the Internet using a server in California or Florida! Try the G3FON tools, as well. The members of the First Class Operators Club use it to perfect their fists and practice their artful and accurate sending skills. Welcome to the halls of the academies of Morse Code!

Universal Understanding

Morse Code, combined with the clever and useful roster of Q-signals (QSL QRP QSO QSY and so on) seasoned with a little bit of French (DE for 'from') creates a solid method of sending messages that transcends languages and manners of speech. Morse really is an amazing and universally understood language.

Morse can also be a miraculous communications bridge to those who can't speak or write. Handicapped people have used code to get their message across. I aided a stroke victim through his rehabilitation by renewing his ability to use Morse Code. What a great way to make new forever friends! For inspiration, look to an organization called HandiHams: https://handiham.org.
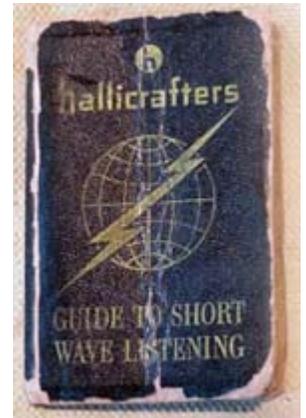
Free Offer

You can obtain a free digital copy of my Morse Code study guide by sending an e-mail request to: n2kz'at'arrl.net. All of your questions and comments are always welcomed! I am always available for help and encouragement. You have your homework: Become good listeners and study code! See what you have been missing!

Until next month, get on the air and listen in! 73 DE N2KZ dit dit

Pocket guide - KD2ITZ

Participants at the January PCARA Breakfast had the opportunity to mingle with members of the U.S. Coast Guard Auxiliary (USCGA). Coincidentally, they were also meeting at Uncle Giuseppe's that morning. J. Michael Reidy from Flotilla 7-5 in Mamaroneck happened to be carrying an interesting item in his wallet, which he proudly shared with the group. Slightly bigger than a book of matches, the *Hallicrafters Guide to Short Wave Listening* packs over 60 pages of information. Printed in 1961, it includes chapters about shortwave propagation, radio transmissions, and, naturally, Hallicrafters equipment. Though it originally sold for 35 cents, copies are currently listed on eBay for over $35. The novelty of the book's size and the nostalgia for a bygone era certainly contribute to the value of the item. For those interested in a free look, a scanned copy is also available online at: https://ontheshortwaves.com/Lists/Halli_Guide_to_SWLing.pdf.

For more information about the U.S. Coast Guard Auxiliary, check out their website https://www.cgaux.org/. Established by Congress in 1939, their mission is:

- *To promote and improve Recreational Boating Safety*
- *To provide trained crews and facilities to augment the Coast Guard and enhance safety and security of our ports, waterways, and coastal regions*
- *To support Coast Guard operational, administrative, and logistical Requirements*

There are numerous licensed radio amateurs active in USCGA, and you may have already met some of them through PCARA. At our chance breakfast encounter, I took the opportunity to invite their group to other PCARA events. There are countless opportunities for our two organizations to collaborate and enjoy both our waterways and airwaves.

Hallicrafter SX-62A as featured in the 'Guide to Short Wave Listening'. Priced just under $400 in 1961 it covered three short wave bands from 1.62 to 32 MHz, plus FM or AM from 27 to 109 MHz.

- Lou KD2ITZ

Run Against Hunger
- News Report

The 42nd Annual Harry Chapin Memorial Run/Walk Against Hunger took place on Sunday October 16th 2022. An initial report appeared in *PCARA Update* for November 2022 on pages 7-9. The Run Organizers have now compiled their own report on the events of the day, with full details published in a letter to *The (Croton) Gazette* for the weeks of Dec 22, 2022 – Jan 4, 2023. This item was too late to be included in the January 2022 edition of the *PCARA Update*, but thanks to Henry, KB2VJP the three-page report from the Run Organizers has now arrived on the Editor's desk. A copy of the paragraph describing contributions from PCARA and WECA members appears alongside.

Vincent KD2VAV and 5K runner Masa JR1AQN outside the Westchester County RACES truck on October 16. [KD2ITZ pic.]

The full report begins by noting that while the October 2021 Run/Walk was a hybrid event, the organizers were hoping that 2022 would be "back to normal" with a completely in-person event and full activities on the lawn of Croton-Harmon High School (CHHS). However, with COVID unlikely to disappear, the hybrid format was retained with both virtual and in-person events.

The organizers declared the 42nd Run / Walk Against Hunger a huge success, with a total of 1,043 registrants for the virtual and in-person events, breaking the record from 2019 and setting another record for donations to organizations fighting hunger.

Here is the paragraph describing support by PCARA and WECA members.

"Local amateur radio groups joined us for the seventh year to aid communications and safety around the courses of all three of our events. Prior to race day we had a Zoom meeting with Greg Appleyard KB2CQE of the Peekskill/Cortlandt Amateur Radio Association (PCARA) and Kathleen O'Keefe KC2VCT, Public Service Director of the Westchester Emergency Communication Association (WECA), which provides the RACES mobile radio command center truck, and Captain Ken Gileo, Jr.

of Croton EMS to plan for Race Day. On Race Day, PCARA and WECA volunteers joined forces, with WECA member Alan N2YGK staffing the Net Control RACES truck at CHHS, while PCARA members took various roles and posts at the finish line and out on the race-course. Victor KC2UAP shadowed Assistant Race Director Mike Grayeb on the CHHS lawn and Larry W2UL rode in our trail car, driven by John Pershing, following the last runner in the 10K so that we could receive immediate communication of race progress. Shifting course location posts for the various events were Greg KB2CQE, Alan N2YGK, Al K2DMV, Russ N2AMP, Rob N2TSE, David K2WPM, Malcolm NM9J, Lou KD2ITZ, Vincent KD2VAV, Steve KD2OFD, David KD2EVI and Jared KD2HXZ. With fifteen individuals from both groups all working together they gave us excellent communications coverage for all three events, staffing eleven different posts along the three race courses as well as the three other assignments mentioned above. They also made sure that all the EMS units could communicate with the WECA truck from more remote parts of our 10K course. Having in-progress race updates from their posts out on the 5K and 10K courses was very helpful in tracking our runners and bringing these races live to our waiting spectators at the high school. The professionalism of both groups certainly belies the word "amateur," and we are indebted to them for continuing to help us improve race safety and communications."

The full report concludes by noting that a return to a live, in-person Giving Day on November 9 resulted in the distribution of checks totaling $53,200 to representatives of organizations combating hunger — a new record for the Harry Chapin Run/Walk Against Hunger. The Race Organizers expressed gratitude for support in the past 42 years and looked forward to the 43rd Run, scheduled for Sunday October 15, 2023.

- NM9J

Chips are down

How many integrated circuits are in your shack, around your home and in your vehicle? In the 1970s, you might have counted them on your fingers — perhaps you had a Nixie-tube frequency counter with TTL logic or a Texas Instruments 'Speak and Spell' or an Apple II computer.

Nowadays, practically every item in your shack, on your belt (phone), in your pocket (key fob), on your wrist, in the garage, in the kitchen and as part of your entertainment system contains multiple silicon chips — also known as **i**ntegrated **c**ircuits.

Where did all these ICs come from? Where were they designed? Where are they manufactured? You might think there are many countries involved in all these activities around the world — but in fact there are just a few.

The history and current status of the silicon chip are described in the book "Chip War – the fight for the world's most critical technology" by Chris Miller.

Chris Miller is Associate Professor of International History at Tufts University's Fletcher School of Law and Diplomacy in Medford, Massachusetts. His previous books have covered the Soviet Union economy, Russia's progress in the Putin era and Russia's attitude toward Asia.
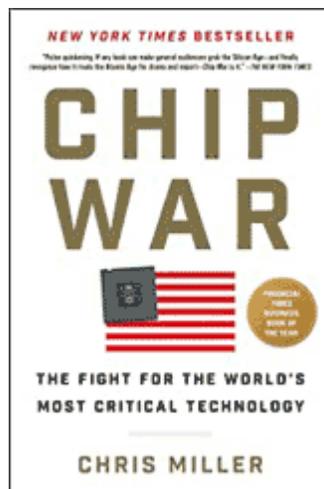
Chris Miller.

His latest book "Chip War" is an account of the struggles to control what may nowadays be the world's most critical resource — microchip technology — an area where the United States and China are increasingly in conflict.

The story begins with early computers based on vacuum tube technology and invention of the transistor at Bell Labs by John Bardeen, Walter Brattain and William Shockley in 1947. Eleven years later, Jack Kilby at Texas Instruments placed several components — transistors, resistors and capacitors — on a single slice of semiconductor, inventing the integrated circuit. Meanwhile a group of engineers working for William Shockley had broken away and founded Fairchild Semiconductor in Palo Alto. One of the group — Robert Noyce — realized that integrated circuits could be built using his company's silicon planar process. Fairchild silicon chips soon found a buyer in NASA. Robert Noyce and Gordon Moore left Fairchild in 1968 to found Intel and manufacture DRAM. A request came in from Japanese company Busicom for a calculator chip set — a request that Ted Hoff realized might be better served by a central processing design as used in minicomputers. (See *PCARA Update¸* Sept 2021, p9 "The Golden Micro" for an account of how Intel's first microprocessor, the 4004 was designed by Federico Faggin in 1970-71.)

Intel's subsequent rise to fame in the age of personal computers, desktops, notebooks and servers is covered, as is the resurgence of Apple Computer following widespread adoption of the iPhone. Design of the integrated circuits for these products still takes place in countries such as the USA and U.K. but manufacturing has moved out of the United States to Asian countries including Japan, South Korea, Taiwan, China, Singapore and Malaysia. And while transistor sizes have become smaller and smaller, production of the highly specialized equipment capable of manufacturing silicon chips has become concentrated in a single country — the Netherlands.

Locations in East Asia involved in the manufacture of integrated circuits.

The People's Republic of China holds that the "Republic of China" on the island of Taiwan is an inseparable part of China. Since Taiwan produces most of the world's advanced processor chips and is only 100 miles across the Taiwan Strait from the Chinese mainland, there is a lot of concern whenever relations between these two countries become strained.

The full story of all these developments and the worrying post-COVID situation is fully covered in "Chip War". A recommended read!

Chip War, Chris Miller, Simon and Schuster $25, 2022.

- NM9J

V.E. Test Sessions

As reported in the January issue, PCARA's last V.E. Test Session of the old year took place at Putnam | Northern Westchester BOCES on December 21, 2022. Two candidates were successful, with new call signs allocated by FCC on December 29, just too late for publication in the January newsletter.

Greg Jannacone of Yorktown Heights passed Element 2 and received his Technician license, **KE2ANJ**. Lewis Kohl of North Salem, NY passed elements 2 and 3, then received his General class license with call sign **KE2ANK**. Congratulations to both. Lew KE2ANK subsequently joined PCARA — welcome!

PCARA had another ARRL VEC Test Session scheduled for the evening of Wednesday January 25 at Putnam | Northern Westchester BOCES Tech Center. Unfortunately, the forecast for snow and rain led to an early closing of the BOCES campus, so Lou KD2ITZ had to inform PCARA's VE Team that the exam session was canceled. Candidates were advised of the date of the next VE Test Session.

PCARA's next Volunteer Examiner Test Session will take place on Saturday February 4th, 11:30 a.m. at Putnam Valley Library, 30 Oscawana Lake Road, Putnam

Valley, NY. This follows on from the 10:00 a.m. monthly meeting at the same location. The session will be under the auspices of Laurel VEC. Candidates must contact Dave KF2BD beforehand using: daveharper'at'vivaldi.net.

Orange County ARC review sessions

Larry W2LGB informs us that Orange County ARC is scheduling **Review Sessions** and **Examinations** for Technicians aiming at the Amateur Radio **General License**. Location will be at Munger Cottage, 40 Munger Dr., Cornwall NY. Dates will be Saturday February 11th, 18th, 25th, March 4th and 11th – from 9:00 a.m. to 1:00 p.m. Each review will be followed by a Test Session.

The current General question pool expires on June 30, 2023 — so this is an opportunity to upgrade ahead of the syllabus change.

Before attending the Orange County ARC Review Sessions, candidates are advised to establish their own regular self-study routine, using the 2019-2023 General Question Pool. One or more of the following can be used.

1. If you need a license manual —
ARRL General Class License Manual **9th** Edition
https://home.arrl.org/action/Store/Product-Details/productId/114241
-or-
Gordon West WB6NOA 2019-2023 General Class FCC Element 3 Amateur Radio License Preparation.
https://www.amazon.com/2019-2023-General-Class-Gordon-WB6NOA/dp/0945053932
-or-
Gordon West 2019-2023 General Upgrade Software with book. GigaParts: https://www.gigaparts.com/gordon-west-general-manual-2019-2023-cd-only.html

2. Pay a visit to qrz.com —
Go to https://www.qrz.com/. Enter your call sign and password. (Follow the prompts to create an account and password, if necessary, using your call sign as ID.) Click on Resources → Practice Amateur Radio Exams, then select the 2019 General Exam Practice Test. 35 test questions are presented randomly, exactly as on an exam, keeping score and identifying areas needing more study.

3. From Scott Davis N3FJP of Affirmatech —
"Amateur Exam Study Buddy" is free, there is nothing to download, it is operating system agnostic, will run entirely in your browser and will even work on your phone. Use Chrome or Firefox for best results. Whether you want to upgrade your own license or help a prospective ham along, you will find Amateur Exam Study Buddy here: https://study.affirmatech.com/ Allows a "retry" if incorrect answer, automatically advances to next question.

4. Download amateur frequency chart —
ARRL Frequency Charts: http://www.arrl.org/graphical-frequency-allocations . Must have!

Session instructions
- Select any of the session dates above. Multiple session attendance is allowed.
- Take the exam after you have attended the number of sessions you desire.
- Send an e-mail request, with your NAME, ADDRESS, PHONE, CALL SIGN and DATES selected to gshacklett'at'earthlink.net to sign up.
- Review application requirements: "What to Bring to an Exam Session" https://www.arrl.org/what-to-bring-to-an-exam-session
- Go to: http://ocarcny.org/ for more information and Munger Cottage location map.

Playing with SDR

Brought and bought

During PCARA's Bring and Buy Auction in January I noticed an item from Joe WA2MCR — it was an SDRplay "**RSP1A 1 kHz — 2 GHz 14 bit SDR Receiver**". I had been thinking about purchasing one of SDRplay's products, so I made a bid (quickly accepted by the auctioneer), paid my money and took home the RSP1A in its plastic packaging.

Spectrum displays

I am no stranger to spectrum displays — my 1995-vintage Kenwood TS-870S HF transceiver was matched with a Kenwood SM-230 Station Monitor, capable of displaying the TS-870's reception 'panadapter-style' on the cathode ray tube. More up-to-date, my Yaesu FT-991A HF/VHF/UHF transceiver has a built-in "Scope" spectrum display with waterfall, capable of showing activity up to ±500 kHz from the operating frequency on its color touchscreen.

FT-991A showing spectrum display and waterfall on the color touch-screen.

These spectrum displays are very helpful for quickly assessing band activity then homing in on a particular frequency — but they have their limitations. The displays are small, lack detail and have relatively slow scanning speed.

The restrictions are largely overcome with a modern **S**oftware **D**efined **R**adio. Displaying the spectrum is just the beginning of their capabilities… depending on model and software, they may also demodulate multiple transmission modes and have all the fine adjustments of a modern high-end transceiver.

Why SDRplay?

SDRplay is a British company. Their SDR receivers are UK-designed and built — with radio amateurs and hobbyists in mind. Several radio amateurs are on the SDRplay team including Jon Hudson G4ABQ in charge of Sales and Marketing plus (in the USA) Michael Ladd

KD2KOG and Steve Brightman KI5ENW. The 14-bit SDRplay units are a significant improvement over earlier 8-bit USB dongle devices, and they also include bandpass and notch filters.

For more information on SDRplay, see their web site, https://www.sdrplay.com/ and the TechMinds interview by Matthew Miller with a visit to the assembly line at: https://youtu.be/aG0D3d4p2aI

Set-up

The RSP1A is the simplest of SDRplay's range of SDRs. There are only two connectors on the plastic case — a single SMA socket for the antenna input and a USB type-B socket for connection to the computer. The plastic case has a conductive coating on the inside for RF shielding, similar to a notebook computer.

You will need a USB 2.0 "A" to "B" cable for connection to a computer. They are often sold as USB printer cables. I would recommend a **wired** male SMA to female SO-239 adapter cable for the antenna input. This will avoid straining the small SMA female connector on the plastic case.

RSP1A with USB 2.0 A-B cable (left) and SMA male to SO-239 female cable.

Before connecting the RSP1A to my notebook computer, I paid a visit to the "Start here" page on SDRplay's web site (https://www.sdrplay.com/start-here/), registered my device then downloaded the latest version 1.42 of **SDRuno®**, SDRplay's own Windows-based software for their range of products. This software package includes the USB driver for SDRplay receivers.

Once the software is installed, it is safe to plug the USB cable from the RSP1A into a USB port, then watch for the hardware driver to be installed. The SDRuno software can then be launched.

SDRuno software

Clicking on the SDRuno icon on my notebook computer opens five (*five!*) separate windows along with a sixth "Startup tip" window. This can be overwhelming… it's rather like sitting down in front of a new transceiver for the first time, with 16 rotary controls and 51 buttons to choose from. Fortunately, help is at hand. There is an **SDRuno User Manual** in PDF format available for download, also accessible us-

ing the "OPT" button in the SDRuno "MAIN" window. (The OPT button opens a drop-down menu of choices.)

The SDRuno User Manual is light on definitions and explanations… there is an "SDR Cookbook" web site by Paul NN4F and Mike KD2KOG providing more detail about the various windows and controls, as well as a Quick Start Guide at the end. See: https://sdruno.nn4f.com/ .

In case you prefer video instruction to written manuals, the SDRplay web site includes a fine collection of beginner and advanced videos. I started with: "SDRUno Basics for 1st time Users", https://youtu.be/k8p106BpSXU . SDRplay also has a YouTube channel, https://www.youtube.com/@SDRplayRSP .

SDRuno start

Depending on your screen resolution, SDRuno will open a number of windows when started. On my notebook PC, the five windows opened are "MAIN", "RX CONTROL", "MAIN SP" (main spectrum), "AUX SP" (auxiliary spectrum) and "MEM PANEL" (memory panel).

*When the SDRuno software first starts it will open five or more windows depending on screen resolution.*

At this point the spectrum displays are **empty**. No reception will take place until you press the green "PLAY!" button in the "MAIN" window of SDRuno.

Nothing will happen until you press the "PLAY!" button (arrowed) in the "MAIN" window of SDRuno.

"MAIN SP" (Main spectrum) is the focus of most attention as it shows a wide, panoramic view of the radio frequency spectrum with a spread of 2.0 MHz to 10.0 MHz. Directly beneath the spectrum is an equally wide waterfall display. See sample below.

"AUX SP" (Auxiliary spectrum) provides a smaller window with a close-up view of the reception passband.
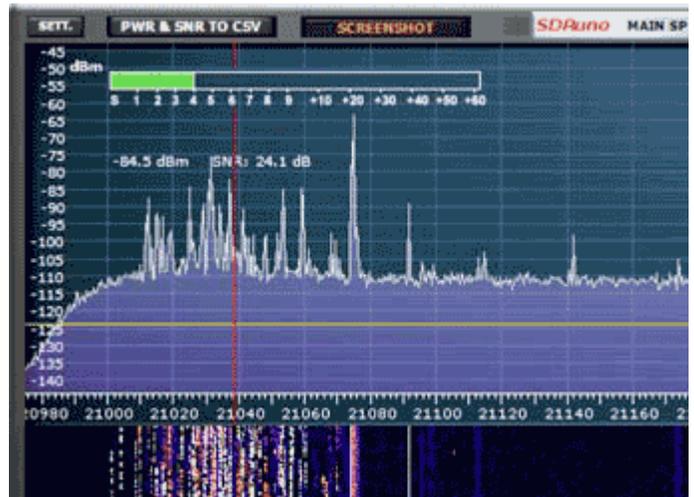
"MAIN SP" (Main Spectrum) close-up shows 15 meter CW activity during the North American QSO Party.

"RX CONTROL" is the main window for setting frequency, mode, filtering, squelch and audio gain. Changing frequency can be tricky until you realize that the **mouse scroll wheel** is used like a rotary control to adjust many items in SDRuno. Hover the mouse pointer (without clicking) over a control and the scroll wheel can then be used to adjust the value up and down. If you hover the mouse pointer over an individual digit of the frequency display, a yellow highlight appears above the number and you can adjust that particular digit by turning the mouse wheel. *Right* clicking over the frequency display will let you set a general tuning step.

Mouse scroll wheel.

SDRuno software's "RX CONTROL" window for adjustment of frequency, mode, filter bandwidth, squelch etc.

Band framing

On the right side of the "RX Control" window is a realistic analogue S-meter. Below is a numeric keypad of band buttons. These buttons can be used for quick access to various broadcast and amateur bands, just like a high-end transceiver. For example, if you press "Bands", "Ham Upper" then "10" for the 10-meter

band, the "10" button lights up green, the tunable frequency range is limited to 27.850 – 29.850 MHz, the mode switches to USB and other settings are optimized for tuning across the 10 meter band. Assuming you have an antenna connected and signals are visible on the "MAIN SP" display, you can mouse-click on a peak or on a waterfall trace to go straight to that frequency, then fine-tune with the mouse wheel for best audio. (If you are using a notebook computer with built-in loudspeakers, you may experience better audio quality using headphones or external amplified speakers.)

S-meter and band-framing buttons.

Other modes — including CW, AM and FM — are available using mode buttons in the "RX CONTROL" window. There is a similar experience on the other amateur bands when you press any of the "Ham lower" or "Ham upper" buttons, all the way from 2200 meters to 23 cm. The '70cm' button only provides access to the European 430-440 MHz segment, though you can program a 'Custom' button for the USA's 440-450 MHz.

If you are listening to narrow-band FM signals on a good quality loudspeaker, you may be bothered by the loud, low frequency hum of a PL or CTCSS tone. In the "EX CONTROL" window there is a button labeled "PDBPF" (pure data band pass filter) that can filter out these unwanted low frequencies. ("EX CONTROL" is available from the "RX CONTROL" window by pressing "EXW".)

Reception on the amateur bands will be best with an outdoor antenna optimized for the frequencies in use. For my initial tests, I was using a multiband sloper antenna.

"EX CONTROL" window provides extra controls for the receiver — including the "PDBF" filter with adjustable low cut (LC).

Broadcast bands

Clicking on "Bands", "Broadcast" places a different set of labels onto the band framing buttons. You can choose "LW" (long wave) or "MW" (medium wave — covering 500 – 1750 kHz, the U.S. AM broadcast band.) There are also buttons for the 75 meter - to -

19 meter broadcast bands, all on AM. Keep an eye on the "MAIN" window — you might see a yellow "OVERLOAD" indicator, especially if you have a strong station nearby like WLNA - Peekskill on 1420 kHz. In that case, adjust the "RF GAIN" slider until the OVERLOAD indicator goes out.

Yellow "OVERLOAD" indicator (arrowed) in the "MAIN" window can be fixed by reducing RF GAIN.

While receiving an AM station, it's worth keeping an eye on the "AUX SP" display which shows a magnified view of the RF spectrum on either side of the carrier. Open up the receive bandwidth to 20 kHz ("20K" button in RX CONTROL) to see the actual occupied bandwidth of the upper and lower sidebands. This view also indicates how heavily the modulation is compressed. As a contrast, take a look at the signal on 1230 kHz, the all-digital WFAS in White Plains.

"AUX SP" display for AM broadcast station WCBS, 880 kHz (top) shows conventional upper and lower sidebands compared with all-digital 'blocks' for HD Radio station WFAS, 1230 kHz.

FM broadcast

There is no framing button for the 88 -108 MHz FM broadcast band, but its easy enough to reach — and all sorts of interesting items can be observed. With a good external antenna connected, click on the "RX CONTROL" frequency display then type in a frequency such as 93900 <Enter>. This will tune the receiver to 93.900 MHz. Click on the mode "FM" button, followed by FM mode "WFM" (wide-FM) or "SWFM" (stereo wide-FM).

Depending on your antenna and location, you should see a bunch of FM broadcast signals spread across the "MAIN SP" spectrum display. Click on a particular signal to hear the audio and enjoy an expanded view of the spectrum in the "AUX SP" window. You can widen out the received bandwidth using the "120K" or "192K" filter buttons. In the USA, broadcast FM signals

are on channels spaced 200 kHz apart, using odd decimal frequencies. In the NYC area, local stations are set 400 kHz apart, e.g. 93.5, 93.9, 94.3 etc. If the powerful signal from WHUD on 100.7 MHz causes the OVERLOAD indicator to light, just reduce RF Gain.

For an FM station carrying digital HD Radio® signals, you should see digital sidebands in the MAIN Spectrum display as solid blocks occupying 70 kHz on either side of the (max) 2 × 130 kHz-wide analog signal — for a total of 400 kHz bandwidth.

Part of the "MAIN SP" display showing FM broadcast stations between 92.7 and 95.1 MHz. At the time, WNYC was in analog mono with its HD Radio digital sidebands visible.

While in wide FM mode, try clicking on the "FMAF" button in the "AUX SP" window. This button is labeled "FM directband display" — when it changes color from white to red, the auxiliary display switches from showing the expanded RF spectrum to instead showing the **demodulated** composite multiplex signal.

In a pilot tone stereo transmission, the stereo difference signal (L – R) is amplitude modulated onto a 38 kHz sub-carrier. While the 38 kHz sub-carrier is *suppressed*, a 19 kHz pilot tone *is* transmitted to provide a phase reference for the stereo receiver along with an indication that stereo is being transmitted. The suppressed carrier difference signal is added to the mono (L + R) signal, the pilot tone and any other subcarriers, then the combined multiplex signal is frequency modulated onto the main carrier.
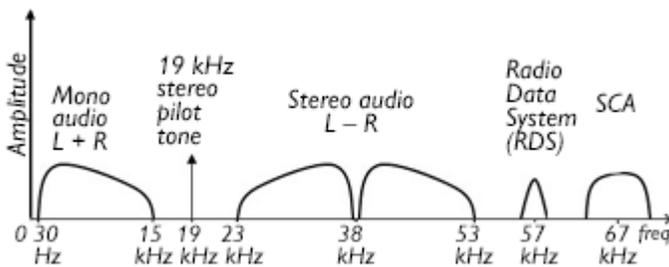
Spectrum of signals applied to a stereo FM transmitter.

Depending on the particular station tuned in using SDRuno, you may be able to see the 19 kHz stereo pilot tone, the stereo L – R difference signal around 38 kHz, 57 kHz RDS (Radio Data System) digital information,

and even SCA (subsidiary communications authorization) transmissions, frequency modulated onto a 67 kHz or 92 kHz carrier.

AUX SP (Auxiliary spectrum) window shows demodulated signal from FM broadcast station WFUV, 90.7 MHz. Clearly visible are the mono (L+R) signal, 19 kHz pilot tone, stereo difference signal (L–R) modulated onto a 38 kHz carrier (suppressed) and RDS data at 57 kHz.

Simple sideband?

While checking different stations in the "AUX SP" window of SDRuno using the "FMAF" - "FM directband display", I noticed an odd situation — some stereo stations were broadcasting a **single sideband** suppressed carrier (SSBSC) difference signal below 38 kHz instead of the normal double sideband suppressed carrier (DSBSC) on both sides of 38 kHz. Only the lower sideband was being transmitted. The reduced bandwidth did not seem to make much difference to stereo reception.
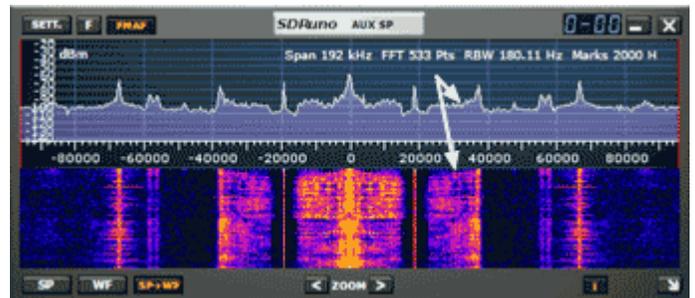
*"AUX SP" display showing spectrum of demodulated signal, from WPAT, 93.1 MHz, with **single** sideband suppressed carrier stereo difference signal (arrowed).*

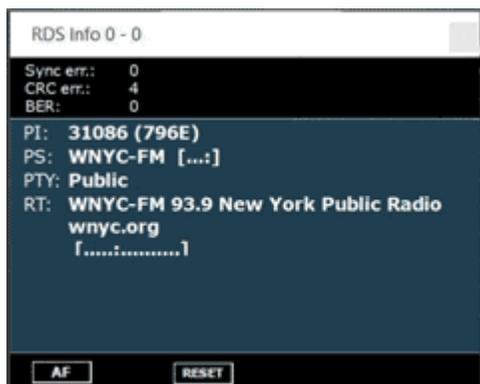Five stations from the NYC area were identified using this type of SSBSC transmission…

WPAT 93.1 MHz Paterson, NJ. (Spanish Broadcstg System)
WQHT 97.1 MHz New York, NY. (Mediaco/Emmis)
WSKQ 97.9 MHz New York, NY. (Spanish Broadcstg System)
WFAS-FM 103.9 MHz, Bronxville, NY. (Cumulus Media)
WBLS 107.5 MHz, New York, NY. (Mediaco/Emmis)

There is some controversy over whether SSBSC has any advantage over DSBSC for FM stereo. Bob N2CBH was involved in the early development and analysis of this technique. See: https://www.radioworld.com/news-and-business/fm-ssbsc-faces-questions.

Radio Data System

SDRuno 1.4 can display the content of FM broadcast **RDS** transmissions, helpful in identifying DX stations when the band is open. In the "RX CONTROL" window, click on "RDSW" to open the RDS Info panel. This will display **PI** (program identification), **PS** (program service name), **PTY** (program type) and **RT** (radio text). The 'PTY' descriptions differ between Europe and North America — PTY Region can be set using "RX CONTROL", "SETT.", RDS tab.

"RDS Info" panel shows four of the fields broadcast by Radio Data System.

FM findings

While checking around the FM broadcast band with SDRuno I came across a couple of interesting situations.

WHUD (100.7 MHz) is not the only FM station broadcasting from the WHUD tower. **W240CR** on 95.9 MHz has been on-air since 2015 — it is a 10W ERP translator for **WOSR-FM** 91.7 MHz Middletown, NY which is in turn part of the WAMC-Albany Northeast Public Radio network. On RDS W240CR identifies with PS: WOSR-FM and RT: WAMC NORTHEST PUBLIC RADIO (sic).

Another station transmitting from the WHUD tower is **W232DQ**, 94.3 MHz a 1 watt ERP translator of AM station WLNA, Peekskill, 1420 kHz. WLNA relays WBPM Saugerties 92.9/WBNR Beacon 1260 kHz/96.5 MHz. W232DQ covers the Peekskill area and identifies most of the time as WBPM. There is no stereo pilot tone and no RDS.

Wild waves

A wideband receiver with spectrum display provides insights into the wide world of wireless. Here are a few more things I found in order of frequency…

Standard Time and Frequency: Reception of WWVB on 60 kHz displays the amplitude changes that set the time on radio clocks. WWV on 15, 20 or 25 MHz can be used to calibrate the RSP1A's reference oscillator. (RX Control – SETT. – CAL tab.)

Non-directional beacons: A dying breed, but I did receive aircraft beacon "SW" (Morse ID) on 335.0 kHz lo-

cated at Stewart Airport.

Amateur bands: SDRuno 1.42 includes an add-on to display DXCluster information. With the add-on activated, station call signs are displayed alongside their spectrum peaks in the "MAIN SP" window.

VHF Digital TV: With a TV antenna plugged into the RSP1A antenna input I could 'see' digital signals from NYC TV stations operating on VHF channels 3, 7, 11, 12 and 13. These wideband transmissions have a carrier visible at 60.31, 174.31, 198.31, 204.31 and 210.31 MHz.

Weather stations: Use the 'amateur high' "70 cm" button to see short data bursts from home weather stations operating around 433 - 434 MHz.

UHF Digital TV: I could 'see' more digital TV stations on UHF channels 18, 20, 21, 24, 25, 26, 27, 28, 31, 32, 34, 35 and 36.

Cell phone towers: After TV channel repacking, channels 38 and above were auctioned off to cell phone companies. I could see strong transmissions on 622-627 MHz, 627-636 MHz, 722-727 etc.

Utility meters: Frequency-hopping spread-spectrum transmissions from water and electricity meters pop up on seemingly random frequencies in the unlicensed "902-928 MHz" band. See *PCARA Update* Sept 2004, p4 "Radio H_2O on 33cm" and Feb 2018 p7 "Smart meters mesh", May 2018 p9 "Smart meter update".

Hunting around

An SDR can be used to track down interference and for direction finding. SDRplay recommends the free software package "RSP Spectrum Analyser", see https://www.sdrplay.com/spectrum-analyser/. The RSGB has a talk by John Rogers M0JAV, using this spectrum analyser to track down RF interference. See: https://youtu.be/z-isgEyF_V4

Conclusions

If you are interested in how the RF spectrum is being used, a modern SDR is the way to go. An SDRplay RSP1A could make a wonderful gift for a youngster with a computer in place of a scanner or general coverage receiver. The **RSP1A** is the lowest cost, entry-level unit from SDRplay's range. Price is around $100 - $125. U.S. distributor is Ham Radio Outlet.

The next model up is the **RSPdx**, with metal case, three separate antenna inputs, improved performance below 2 MHz and a 500 kHz low pass filter for LF/VLF. Cost is around $215 - $250.

The **RSPduo** is a dual-tuner version, capable of monitoring two separate 2 MHz-wide chunks of spectrum simultaneously. This allows comparison of antennas, diversity reception, noise cancellation and dual-band applications such as monitoring VHF air traffic control alongside ADS-B transmissions of aircraft location on 1090 MHz. Cost is around $290.   - NM9J

Peekskill / Cortlandt Amateur Radio Association

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Web site: http://www.pcara.org
PCARA on Facebook: https://www.facebook.com/pcararadio
YouTube Channel: https://www.youtube.com/@peekskillcortlandtamateurr7670

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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.
Sat Feb 4: Monthly meeting. 'Introduction to 3D Printing - A Ham Radio Perspective', N2HTT, 10:00 a.m., Putnam Valley Library, 30 Oscawana Lake Rd., Putnam Valley NY. Followed by V.E. Test Session at 11:30 a.m., see below.
Sat Feb 18: PCARA Breakfast, 9:00 a.m. Uncle Giuseppe's, 327 Downing Dr., Yorktown Heights, NY.

Hamfests

Check with organizers before leaving.
Sun Feb 26: LIMARC Hamfest, Levittown Hall, 201 Levittown Parkway, Hicksville, NY 11801.

VE Test Sessions

Check with the contact before leaving.
Feb 4: PCARA, 11:30 a.m. Putnam Valley Library, 30 Oscawana Lake Rd., Putnam Valley NY. Must contact Dave KF2BD, daveharper'at'vivaldi,net.
Feb 4, 11, 18, 25: NYC-Westchester ARC, 43 Hart Ave, Yonkers NY. 12:00 noon. Must contact VE, k2ltm'at'aol.com.
Feb 17: Orange County ARC, 6:00 p.m. Munger Cottage, 40 Munger Dr, Cornwall NY. Contact Joseph J. DeLorenzo, w2bcc'at'arrl.net

[WECA VE Test sessions on the second Thursday of each month had not been listed by ARRL at press time. Contact Bob N2GDY (N2GDY'at'weca.org) for information about future WECA sessions.]

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