



PCARA Update



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Summer breakage

The summer break was somewhat subdued due to the COVID-19 pandemic. Regardless, we managed to still do a few things as a group. On Saturday July 18 and Saturday August 15 we met for **PCARA Breakfasts** at 9:00 a.m. at Downing Park Pavilion in Yorktown Heights, NY. During both occasions we practiced responsible social distancing with face masks in place.



PCARA Breakfast at Downing Park pavilion.

Although not as personal as formerly traditional breakfasts, it was a treat to be able to socialize with others! On both days we had excellent weather in a most pleasant location. At both gatherings we had approximately 10-12 attendees. Thank you to all who came out to help bring back some sense of normalcy to very unsettled and uncertain times.

Two other occasions for gathering took place on the evenings of July 5th and August 25th when members of PCARA met at Fleischmann Pier in Charles Point Park to watch USS



On August 25 the refurbished USS Slater was homebound for Albany as it turned toward the Bear Mountain Bridge.

Slater DE 766 pass through Peekskill Bay on its voyages to and from Caddell Dry Dock & Repair in Staten Island, NY for much needed restoration work. The entire adventure is documented on the USS Slater's website <https://usslater.org/>, where a time-lapse video of her trip down the Hudson River is also available. [See report on page 10 - *Ed.*] The *Slater* reopens for visitors on Wednesday September 2, 2020. When things settle down, a club road trip to Albany is in order.

Some- where in the mix on Tuesday August 4, 2020, **Tropical Storm Isaias** tore through our area leaving a dreadful amount of damage to utilities' infrastructure from wind and



Three-phase electrical primary and cable TV lines on Maple Ave, Cortlandt Manor, brought down for several days by Tropical Storm Isaias. [Pic by Lovji N2CKD].

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fallen trees. Yours truly was most fortunate to have only lost phone and Internet service for four days (the phone service till this day still isn't operating at full measure). The good news is that our repeaters stayed up and running allowing the Roundtable nets to continue and provide a means of communication for those that lost utilities. That's what it's all about! On that note, the **Old Goats Net** returned to the air on Thursday August 6, 2020 at 8:00 p.m. with Karl N2KZ at the helm as Net Control — welcome back!

On the horizon we have a couple of upcoming events. On Saturday September 26, 2020 PCARA has a double header. At 9:00 a.m. in Downing Park in Yorktown Heights, NY, a **PCARA Breakfast** is scheduled. This location is very pleasant and for those with furry companions, please know that it is dog friendly. (Bring along 'K9DOG, N2RUF, WA2MUT, K9FUR'). Next, at 11:00 a.m. outside the John C. Hart Memorial Library a **PCARA V.E. Test Session** will be held. This is our first V.E. Test Session since January 18, 2020. Because of the hiatus due to the pandemic, the session could be very well attended. Please spread the word that we're back and ready to rock-and-roll! The use of masks and social distancing will be in effect.

Our next scheduled **PCARA Membership Meeting** is on Sunday September 13, 2020 at 3:00 p.m. outside the John C. Hart Memorial Library in Shrub Oak, NY (rain or shine). Bring your own chair (BYOC?) and facemask. Responsible social distancing will be observed. As always **all are welcome**, along with your thoughts and ideas for future activities. I look forward to seeing each of you there!

Please stay safe and keep your heads down. We will get through this **together. EXCELSIOR!**

- 73 de Greg, KB2CQE

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Net night

Peekskill/Cortlandt Amateur Radio Association holds a weekly net on the 146.67 MHz W2NYW repeater on Thursdays at 8:00 p.m.

Join net control Karl, N2KZ for news and neighborly information.

V.E. Test Session

PCARA's last V.E. Test Session was held on the snowy Saturday of January 18, 2020. The subsequent session scheduled for Saturday March 14 at John C. Hart Library had to be canceled as a result of COVID-19 precautions.



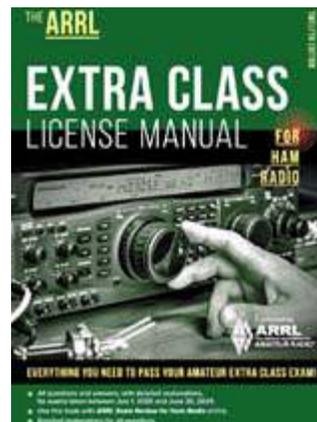
PCARA's last V.E. Test Session took place on January 18 at John C. Hart Memorial Library in Shrub Oak.

Good news — after a seven month hiatus, PCARA V.E. Testing will resume on Saturday September 26th, 2020 at the John C. Hart Memorial Library in Shrub Oak, NY, starting at 11:00 a.m. The location will be outdoors, on the Library porch. Masks and social distancing will be required.

Candidates should bring the usual requirements for any V.E. Test Session — Photo ID, SSN or FRN, and current license (if applicable). The fee is still \$15.00 per test or re-sit.

Unlike previous PCARA test sessions, this will **not** be a case of "walk-ins welcome". Instead all candidates are asked to contact V.E. Team Liaison Mike W2IG before the event using e-mail address: w2igg@yahoo.com.

Candidates for the Extra Class examination should be aware that the Element 4 Question Pool changed on July 1, 2020. Make sure you have been using up-to-date Instructional Material such as The ARRL Extra Class License Manual, **12th Edition** and ARRL's Extra Q&A **5th Edition**.



ARRL Extra Class License Manual 12th edition is good for tests taken July 1, 2020 to June 30, 2024.

Adventures in DXing

- N2KZ

New Again

I have visited many places and met many people in the past few months. I didn't have to arrange travel or accommodations. There were no airport security checks or COVID-19 tests. My journeys required venturing only a few feet — not thousands of miles. Some of my activities did not even require me to utter one word.

Over-the-air, my conversations came from my wrist and fist. How appropriate in these days and times of novel viruses!

My first encounter arrived in my mailbox. I received a nice traditional long handwritten letter from Ted Figlock, W1HGY. He found me through my association with the FISTS CW Club.

Recently, Ted had suffered a debilitating stroke. As part of his rehabilitation, Ted decided that reviving his skills with Morse code would be just the thing. Could I help?

Ted has quite a history. At 85 years old, Ted has been an active ham since the middle 1950s! He worked for decades as an obstetrician and gynecologist and later as a compensation and benefits counsellor in the Veterans Administration along with a diverse career in the U.S. Army including a tour of duty in South Vietnam.

With a silent salute to his honor, I happily took on his request. Our daily meetings via cell phone bore excellent results. Ted previously was proficient in code. Together we began to revive his neurons to allow him to once again be ready to receive.

My approach to teaching Morse code is untraditional. I have heard of all sorts of approaches: singing code, learning code with music, hypnosis, repetitive drills of random letter and number groups and all sorts of other painful tortures. I prefer to teach conversational Morse. I find this method to be much more palatable with rapid gratification and success.

Most Morse conversations on ham radio tend to be very repetitive. Your call sign and my call sign. Where are you and what's your name? Your rig and antenna? How's the weather? How old are you and how long have you been a ham? Over and over again, Ted and I practiced basic QSOs with all sorts of tomfoolery in the content. A good beginner's QSO may only contain half of this information. Together, we were preparing him to once again take wing and fly!



Ted W1HGY.

This is how Ted and I started: My practice messages were sent very, very slowly — just one single letter at a time. Classic confusing letters, like L and F — and C and Y — sometimes had to be sent more than once. With patience and fortitude, I carefully sent each and every letter until the messages were complete.

Ted was a great student. He would march on relentlessly for 15 or 20 minutes until I could hear he was growing tired. Yet, each sentence was a victory. Improve he did and he made great progress! We shared the victories and we shared a new friendship.

In our 'down time,' Ted listened to on-the-air CW QSOs and tried to make sense of what was being said. I was always delighted to hear him say 'I actually understood some of it!' Now Ted is on his own. Fear not! We still 'touch base' on a regular basis!

Ted's most important amateur radio event every week is participation in the Saint Maximilian Kolbe Radio Net. This is a gathering of the followers of 'Saint Max,' SP3RN, known as *The Saint of Ham Radio*. The net starts at 0000 UTC on Sunday evenings on 3814 kHz.

Even the frequency honors him: St. Max passed on August 14, 1941. For full



SP3RN 1938 radio shack.

details of his fascinating life and story, see:

<http://www.saintmaxnet.org/>. Ted has had a blessed life and I am so glad I had an opportunity to make his smiles and inspiring spirit continue further!

Wish Granted

When I was gifted with my first-ever shortwave radio back in 1965, I was fascinated and amazed that I could actually hear strong and reliable signals from Australia in the early mornings here in New York. It would only follow that I wished that someday, someday, I could actually work Australia with my own signal crossing the multitudes from here to there.

On the morning of May 29, 2020, at about 6:30 a.m. Eastern local time, I heard a big signal on 40 meters from Ian Williams, VK3MO, in Kyneton, Victoria, Australia near Melbourne. With childhood glee, I gave him a call and he heard me



Ian VK3MO.

right away! I was elated like it was my first QSO. At 10,399 miles, it could easily be my most distant contact ever. I waited 55 years for this moment. What an excellent day it was!

Looking him up on the Internet, it became obvious why he could hear me with ease. This was no ordinary station! Tall, tall towers with elaborate stacked antennas rule. His 20 element rotating array for 20 meters is legendary. All I can say is: 'Thank you very much, Ian, for making dreams come true!' For a good look at Ian's mesmerizing QTH, head for:

<http://www.vk5sw.com/VK3MO.htm>. Who will be my next VK? ...and will I ever be able to reach India? Stay tuned!



4 x 5 element stack of 20 meter Yagis at VK3MO.

You Are Very Welcome, Karl

Scotland was the next stop in my virtual world-wide tour. It actually began when I was researching my June 2020 PCUD article on SWLs and hams. I met several people involved with the Radio Society of Great Britain (RSGB) and other British radio enthusiast groups.

I found myself most interested in an amateur radio group based in southwest Scotland: The Wigtownshire Amateur Radio Club (WARC.) My timing could not have been more perfect.



Due to the pandemic, WARC had just started weekly Zoom meetings and I could easily join in by simply clicking on a provided link every week. Introducing myself using Zoom brought a warm welcome and instant familiarity. It's amazing technology!

Participating in WARC's Zoom conferences was revelatory. Together, we quickly noticed how easy and convenient virtual group meetings could be. WARC covers a wide area geographically and most members have had quite a drive to attend their meetings. With

Zoom, attending meetings is immediate and stress-free. When the seasons turn to winter, everyone will gladly stay home instead of daring to venture out in the snow and ice.

The club is not reverting to an exclusive reliance on the Internet. A local 2 meter repeater net ties club members together daily at noon. Special events, like the recent International Lighthouse and Lightship Weekend on August 22 and 23 from the nearby Mull of Galloway, still brings the WARC membership together in person creating a nice balance between virtual and reality!



The Mull of Galloway, the southernmost point in Scotland, lies at the end of the Rhins peninsula.

You might think the lighthouse at the tip of the Mull of Galloway is some sort of DX heaven. If you travel to the end of this peninsula you will be almost completely surrounded by water. The lighthouse sits high upon a cliff 260 feet above sea level. Climb to the top of the lighthouse tower to gain yet another 85 feet. Consult a map and you will see that you are not just overlooking the Irish Sea. You will marvel at the clear over-water paths to Iceland and Greenland to the north and Portugal and Spain to the south!



Mull of Galloway lighthouse.

Operate on VHF and you'll enjoy your proximity to Belfast (40 miles away) and the Isle of Man. Even Southport (100 miles away) is within the realm of possibility during a good tropo lift. Oh, what I would do to operate on 160 meters from this paradise! (Bring

enough wire for a counterpoise. You will be sitting on pure rock!)



The 85 foot Mull of Galloway Lighthouse is perched on the edge of a 260 foot high cliff.

Take fair warning: It can be rather windy here and you may find expressions of weather pretty dramatic! I know my experiences with my newfound friends in Scotland have only just begun. I'll let you know how things progress! Meeting all the folks at WARC just might be the beginning of a beautiful friendship.



Wigtownshire Amateur Radio Club 'Zoom' meeting.

Secrets Within the Manual

Spending months in self-quarantine can turn your attention to a whole new world. For instance, when you are home continually you begin to notice just how wonderful and interesting your surroundings really are. Previously, my experiences at home mostly included catching up with sleep and catching up with chores. Now I really appreciate the grand place where I live!

I cleaned my office to allow human occupation. You wouldn't believe the things I re-discovered. Did you know there is a blue carpet under there? I also had time to delve into the behemoth manual for my Yaesu transceiver. The basic operator's manual is about 140 pages. There are also accessory and update supplements. This could keep you busy for a while!

Early on, when I first purchased my FT DX 1200 back in January 2014, I printed out the entire manual and created a loose-leaf binder allowing me plenty of

space to record notes and discoveries. I have to admit that I was more than overwhelmed with the complexity of the unit. I had never owned a radio that was actually a computer with peripherals before.

I managed to get through the basic and intermediate features but many things required time, patience and experimentation to understand. Notes and procedures have been collected and penciled-in from day one. Just the digital signal processing filters are plenty to digest. At long last, I had many occasions to increase my mastery. I now have my CW break-in delay set perfectly. I experimented with Beacon Mode with QRP CW on 20 meters. Low and high cut CW filters, wave shapes, QSK timing... it goes on and on!



Karl's reprinted FT DX 1200 Operating Manual in its loose-leaf binder.



Yaesu FT DX 1200 4.3" TFT color display with S-meter and spectrum scope.

Needless to say, my logbook entries increased dramatically. In turn, my Morse proficiency soared. I had the honor and privilege to operate for

hours during the ARRL VHF/UHF Contest in June. I wish I had a second self who could work the Pacific Rim daily from 2:00 a.m. to 6:00 a.m. Eastern. The few times I ventured there the results were amazing. ARRL Field Day was at my convenience too! (I usually work starting at 6:00 a.m. early Sunday mornings)... and I had a chance to take a virtual tour around the world!

Please join us for the PCARA weekly Old Goats Net. Look for us at 8:00 p.m. Eastern Local Time, Thursdays on the PCARA 2 meter repeater: 146.670 MHz - minus 600 kHz offset, 156.7 PL tone. All welcome! Anyone can listen in!

Until next month, 73 and dit dit de N2KZ "The Old Goat."



At the “Hart” of the Community — KD2ITZ

In recent months, countless gatherings of friends and loved ones have been canceled due to social distancing. Additional challenges arose as Isaias battered vulnerable infrastructure. Amateur radio operators are fortunate, however, to have the capability to get on the air despite the circumstances. Our own club has proudly pursued distant socializing on the PCARA repeaters for over 20 years. Throughout the lockdown, frequent radio contacts have solidified the bonds of friendship among our members. As organizations across the region reopen for business, PCARA welcomes the chance to demonstrate the resilience and camaraderie of the amateur radio community. We are proud to report that in September we will again begin in-person meetings and licensing exam sessions, thanks to the generosity of Jennifer O’Neill, the director of the John C. Hart Memorial Library. Please make an effort to attend and show your support.



The John C. Hart Memorial Library in Shrub Oak.

The “Look Back” section in the August 2020 *QST* featured another local radio club with close ties to a Hudson Valley library. On the bottom of page 90 is a photo from 1970 of Herb Lacey WB2LZJ donating a copy of the *ARRL Handbook* to the Kingston Library. Although the book is likely no longer in circulation there, many vintage amateur radio publications,



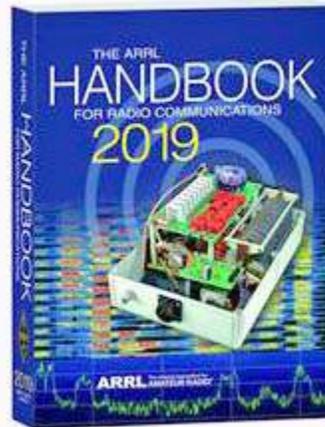
WB2LZJ donating ARRL Handbook to the Kingston library in 1970. [QST Oct 1970.]

including *Handbooks*, are freely available on The Internet Archive: <http://archive.org>

For those interested in a newer edition, *The 2019 ARRL Handbook* can now be borrowed from the Croton Free Library. PCARA would like to thank Bob N2CBH for the donation and Jesse Bourdon, the library director, for graciously accepting it. Like its predecessors, the 2019 version



Vintage amateur radio books are available through the Internet Archive.



provides a comprehensive review of electronics theory and circuit design, but also contains many new chapters with plans for antennas, RF filters, and low-noise oscillators. With over 1200 pages, the book contains information of interest to every ham. The book is available on-site, or by request at any branch in the county — at no charge. More informa-

tion is available at: <http://www.westchesterlibraries.org/>

As we look for ways to attract interest in the amateur radio service, cooperation with libraries remains more important than ever. A recent Gallup poll found that, in 2019, Americans visited public libraries more often than movies, live sporting events, museums, concerts, amusement parks, and casinos, among other activities. PCARA has been fortunate to have a great relationship with numerous libraries in Northern Westchester. Hart Library has always been very accommodating to our VE sessions. In recent years, our club has scheduled technical workshops at both Hart and Croton Libraries. We participated in Repair Café at the Peekskill Library; and the PCARA special event station at Hart was extremely well attended.

These events have attracted the attention of not only our club members, but also hams outside PCARA and individuals who aren’t



PCARA Special Event Station at the John C. Hart Library, Aug 26, 2018.

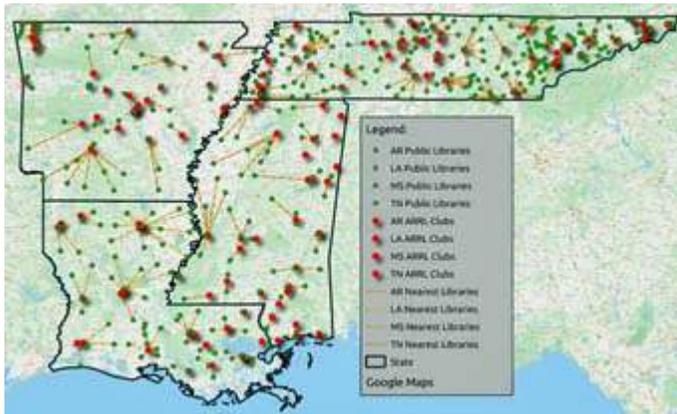
licensed amateurs. We look forward to more activities involving the region’s libraries and know that they will

continue to yield positive results.

In order for amateur radio organizations to fully appreciate the mutual benefits of partnering with their local library systems, there needs to be a paradigm shift. Professor Frank Howell K4FMH suggests that:

The ARRL and other EmComm groups often use the term, “served agency,” to indicate an agency or organization needing specific attention by amateur radio groups. We have yet to implement a similar perspective or approach for educational outreach... Schools can be one. But so can public libraries.

Many readers may recognize Frank from the ICQ Podcast and may know that he also happens to be a professional demographer based in Mississippi. He has worked with his local ARRL Division Director to create maps indicating all the radio clubs in their territory and all the libraries that are nearest to them. This two part initiative called “Plant the Seed! Sow the Future” encourages clubs to buy a collection of books, which are discounted by the ARRL, for donation to their local libraries. The essential second step encourages clubs to create ongoing relationships with the libraries they serve by engaging with the general public through programs about our hobby. More information can be found on Frank’s blog: <http://k4fmh.com/>



ARRL Delta Division clubs (red dots) are encouraged to partner with local libraries (green). [Image credit: K4FMH]

One of the best ways to create meaningful cooperation between hams and their libraries is to permanently install equipment on site. In the suburbs of Chicago, the North Shore Radio Club has built a functional amateur station in the Northbrook Public Library. The library already had a maker space with 3D printers, soldering stations, and microcontroller kits. The club, however, was fortunate to also have the cooperation of a library employee who attained an amateur license. This individual made it easier for the library to divide responsibilities with the hams. Listen for their club call sign NS9RC on the air.

Libraries have continued to engage in community events, despite social distancing. They have scheduled



North Shore Radio Club NS9RC station installed at public library in Chicago suburbs. [Pic credit KR9T]

numerous in-person and virtual educational and recreational programs. In addition to our club’s planned events for September, there are still opportunities for PCARA to reach out. Todd Traver N2MUZ is working on a videoconference to offer library patrons a glimpse of the magic of amateur radio. Details to follow.



Todd N2MUZ — seen here during his January presentation on the μ BITX at John C. Hart Library — is planning a videoconference to share the magic of amateur radio.

Club members are urged to share any additional ideas for promoting ham radio to the public during these uncertain times. Amateurs must seize this moment to welcome more people into our great hobby.

- Lou, KD2ITZ

Dual-band NMO-mount antenna installation - KD2EVI

Comets, Preppers and Frontiers

I installed a Comet SBB5 dual band NMO-

mount antenna in my 2015 Nissan Frontier pickup truck along with a 5 meter long Comet CK-3NMO cable that came with a PL-259 connector installed. This combination replaces the magnetic mount antenna that I had been using.

I have cut holes and installed antennas in cars before, but that was for AM radio installation in vehicles that came without a factory installed radio, about 50 years ago. Consequently, I approached this project with a little trepidation. For guidance I watched a YouTube video by 'COMMSPREPPER' showing his installation in the same model truck. COMMSPREPPER has a number of ham radio related videos on YouTube. (See: <https://youtu.be/9eJcC1mNLGc> -Ed.) Greg, KB2CQE, very kindly gave me encouragement, advice, and lent me a 3/4" hole saw for the NMO mount.



Nissan Frontier pickup truck.



Comet CK-3NMO cable assembly with PL-259 connector, NMO mount and 5 meters of coax.



Comet SBB5 NMO Dual Band 2m/440MHz fold-over mobile antenna, CK-3NMO Deluxe Mobile Lip Mount cable assembly and Loctite Dielectric Tune-Up Grease. [KD2EVI pic]

Trim removal

Following advice in the video, I purchased a set of plastic trim and molding removal tools from Harbor Freight. These came in very handy to remove the interior trim. Nissan holds the interior trim and headliner in place



Harbor Freight "5-piece Auto Trim and Molding Tool Set". [KD2EVI pic.]

with plastic clips, not screws. I decided to follow COMMSPREPPER's example and mount the antenna towards the front of the cab, where access to the roof could be gained by removing the forward interior light assembly and where no support bars are located. The coaxial cable ran across the roof, down the A-pillar, and underneath the dash to my TYT TH-8600 dual band radio.

As Greg and COMMSPREPPER both emphasized, there is an air bag unit underneath the A-pillar trim. It is very important that the coax be placed **behind** the side-curtain air bag. (I did not have to worry about air bags 50 years ago!). The interior light unit easily popped out, but the A-pillar trim was a much tighter fit. The trim removal tools enabled me to remove it without damage.

Cable pull

At this point I decided to run the coaxial cable before drilling a hole in the roof. As the PL-259 was already installed I had to find a path that had enough clearance for the connector.

If not, the coax would have to be cut and a new PL-259 installed. Fortunately Nissan allowed just enough space to get the connector past the side of the dashboard. The coax was placed behind the air bag, so it would not be in the way if the bag



NMO mount and cable dangles down next to the dome light assembly after being fished across the roof. [KD2EVI pic.]

Comet SBB5

inflates. A stiff piece of aluminum wire was used to “fish” the coax across the roof and past the dashboard. I then had to remove the lower glove box, which was held in place by four Phillips head screws, to bring the coax across the dash to the center where the radio currently is. Alternatively, I could have placed the antenna towards the rear of the cab and run the coax down a rear pillar, then forward under the carpet and seats and not have had to go near the air bag.

Prepare to drill

The coax being run, I decided to quit for the day and cut the hole the next morning. Cutting through the roof produces a great number of small, sharp, steel pieces, which are liable to scratch paint and auto glass. The day prior to installing the coax, I washed and waxed the roof and put a fresh coat of Rain-X on the windshield, giving a slippery finish to both, so any small steel pieces could be easily blown off with compressed air.

I began by measuring the roof to find the mid-point, which I marked on a piece of masking tape with a Sharpie. As my Frontier came with a Sirius XM satellite antenna located at the front of the roof, I had to position the NMO mount behind the satellite antenna and still stay clear of internal roof supports. I measured back two inches and marked the spot with another piece of masking tape. A few more pieces of tape were added to protect the paint.



The position to drill was marked on the pickup's roof using 3M yellow masking tape. [KD2EVI pic.]

I needed a ladder to get high enough to position the drill. Had the antenna been placed at the rear of the cab, I could have stood in the bed of the truck.

The new, sharp drill bit quickly went through the roof. I had to clean up the hole with a small file



Cablematic® 3/4" hole saw as used to drill hole for NMO mount.

to allow the mount to pass through. I used my air compressor to blow off the steel shards and made sure no pieces were left on the roof, windshield, or trapped under the wiper blades. I tightened the antenna mount, added the antenna, and replaced the interior trim and glove box. Excess coax length was left under the dash and is available in case I move the radio location.



Comet SBB5 dual-band antenna on the newly-installed NMO-mount. [KD2EVI pic.]

Drilling the hole and putting the antenna on was the simplest part of the job. Removing interior trim and deciding how to run the coax was the most time consuming portion. If you wish to install a permanent antenna, it is important to determine your coax path and antenna location, but it is not a very difficult project.

Future plans

I next plan to hard-wire the power to the radio in place of the cigar lighter outlet that I am using now. The present arrangement limits me to a lower powered radio. If I can get a better power source, I will then be able to install a 50 watt radio. The TYT TH-8600 is an adequate radio, very compact, but not as nice a



TYT TH-8600 25 watt dual-band mobile transceiver.

radio as the Icom IC-2730A that I use as a base station in my QTH. Having removed and replaced trim panels gives me the confidence to explore more permanent mounting options than I am using now. Stay tuned!

- David KD2EVI

USS Slater sail-by

Readers may recall that Stan Levandowski, WB2LQF gave a presentation to the March 2018 PCARA meeting on “The Three Lives of the *USS Slater*”. The *Slater*, DE-766 is the last World War II Destroyer Escort afloat in America, and is moored at the Port of Albany, NY.

Those three lives of the *Slater* began in May 1944 when the ship was launched in Florida then commissioned into the U.S. Navy during World War II. Much of her war service took place in the North Atlantic, escorting convoys to Britain while warding off enemy submarines. When the war in Europe ended, the *Slater* sailed to the Pacific for more convoy duty. After decommissioning, the ship was transferred in 1951 to the Greek Navy where it saw duty for four more decades as the *Aetos* — including a role in *The Guns of Navarone* — the 1961 movie by Carl Foreman, in which allied commandos attack a German fortress in the Aegean Sea.

In 1993 the retired *Aetos*, was awaiting disposal in Crete when members of the Destroyer Escort Sailors Association (DESA) raised sufficient funds to return the vessel to the

USA. The *Slater* was initially moored in New York City at the Intrepid Air and Space Museum, then



USS Slater, DE-766. [Pic credit DEHM]

transferred in 1997 to its present home in Albany, NY.

A large crew of volunteers is involved with restoration and maintenance of the vessel in Albany — this includes recent repair and reinstallation of period radio equipment undertaken by Steven Syrotynski, W2TRH. Operational radios now include the RCH LF/HF receiver, RBL-5 low frequency receiver and RAO-2 low radiation MF/HF receiver.

Larger items also need periodic repair — and at the beginning of June 2020 Joe Eckhardt VP of Engineering at Caddell Dry Dock and Repair Co. in Staten Island called the Destroyer Escort Historical Museum (DEHM) to report that a couple of shipping businesses had canceled their overhauls, opening up space in July for the *Slater* to have planned work carried out on its mast, stack and keel.

The ship was hurriedly prepared for a trip down the Hudson River — not an easy thing to arrange when engines are not functional and the vessel cannot proceed under its own power. Two tug boats were arranged and the sailing schedule posted. Stan WB2LQF sent PCARA the following bulletin.

“Salute as she passes by !

USS SLATER TRAVELS DOWN HUDSON RIVER

- Sunday, July 5, 2020

The USS SLATER will be leaving Albany at approximately 5:30 a.m. on Sunday, July 5th, for Cadells shipyard to have some work done. She'll be traveling with her tugs at about 8 knots. Cadells Shipyard is on the northern shore of Staten Island in West New Brighton just opposite Bayonne, New Jersey.

Approximate times along the route can be found at the Hudson River Vessel Tracking site in the following Facebook post. (see URL below)

Just enter one of the tugs' names — *Sarah D.* or *Nathan G.* — into the tracking site. She's the last of 563 Destroyer Escorts built during WWII and Franklin D. Roosevelt — from right here in Hyde Park — played a rather important role in getting Navy hierarchy to focus less on “big iron” and more on these fast and nimble submarine hunters that were responsible for our winning the Battle for the Atlantic.

<https://www.facebook.com/USS.Slater/> ”

Several members of PCARA expressed interest in viewing the vessel as it transited Peekskill Bay on her way to Staten Island during the afternoon of Sunday July 5. David KD2EVI and NM9J monitored *Slater's* southward progress, based on the tugs' position — as reported at sites such as <https://www.marinetraffic.com/> . We estimated time to reach Peekskill around 7:30 p.m. on Sunday evening. Greg KB2CQE thought that Charles Point / Fleischmann Pier would be a good viewing point and suggested meeting there at 7:00 p.m.

It was a warm, sunny evening as David KD2EVI. Greg KB2CQE and NM9J arrived at the Charles Point parking lot. Greg's son and XYL arrived a little later. We were equipped with binoculars, radios and scanners tuned to the Marine VHF Channels.

At 7:57 p.m. one of the tugs reported approaching Bear Mountain Bridge and — using binoculars — bright blue lights on the escort vessels could just be seen below the bridge deck. By 8:11 p.m. the *Slater* was visible by eye as it entered Peekskill Bay.



From Charles Point Park, David KD2EVI and Greg KB2CQE (right) scan the waters of Peekskill Bay across to the Bear Mountain Bridge, four miles away.



USS Slater becomes visible as she sails under the Bear Mountain Bridge and into Peekskill Bay.

With the sun now behind Dunderberg Mountain, viewing conditions were not ideal. Socially-distanced sightseers at Charles Point were able to view the vessel as it passed the end of Fleischmann Pier at 8:23 p.m.



A group of people watch the USS Slater and her escorting vessels sail past the end of Fleischmann Pier on July 5.

Here is a quote from “Trim but Deadly”, quarterly newsletter of the Destroyer Escort Historical Museum by DEHM Chairman Bartley Costello:

“And so, it was on this sunny July morning with no threat of any enemy, that tugboats “Sarah D.” and “Nathan G.” eased Slater, and its crew of 15 members down the Hudson River. The ship was accompanied by hundreds of boats, fire, DEC and State Police boats, drones, biplanes, seaplanes, helicopters, eagles, and thousands of cheering individuals ashore and on bridges. They watched as we sailed south, piloted by Hudson River and Sandy Hook pilots.”

The voyage continued through the night, reaching the shipyard at 7:00 a.m. on Monday morning. Work began with scaffolding erected around the mast, some parts of which were in serious disrepair. The mast supports air and surface search radar antennas, wave-guide, IFF antennas, fighting lights, navigation lights, bullhorn, whistle and flagstaff. Some of these items

were badly corroded and replacements had to be carefully fabricated. Long-wire antennas above deck also needed repair.



Restored air search radar antenna is returned to Slater's mast, now surrounded by scaffolding. [Pic credit DEHM].

On July 24th, the USS Slater moved to dry-dock with further work taking place during July and August. Return to Albany was expected on August 21st, but when the dry-dock was flooded, a leak was detected in the Slater's aft motor room. After further work, departure from the shipyard took place on Tuesday August 25th at 2:15 p.m. David KD2EVI and NM9J plus a smaller crowd watched the refurbished vessel as she passed Charles Point at 7:00 p.m. on her way back to Albany.



Refurbished USS Slater sails past Peekskill on August 25.

In the “Trim But Deadly” newsletter, Executive Director Timothy C. Rizzuto writes:

“We are still short \$200,000 of the funding we need to completely cover the shipyard cost. To date we have raised \$274,000 and with the \$200,000 Maritime Heritage Grant we have a total of \$474,000. That leaves \$226,000 short of covering the total shipyard bill. So please continue with your generosity, in the hope that we won't have to use our endowment funds for this project.”

The USS Slater is owned and operated by the private not-for-profit Destroyer Escort Historical Museum. For details of how to make a donation see: <https://uss Slater.org/donate> .

- NM9J

ZS6BKW revisited

A computer-optimized G5RV & Junior version

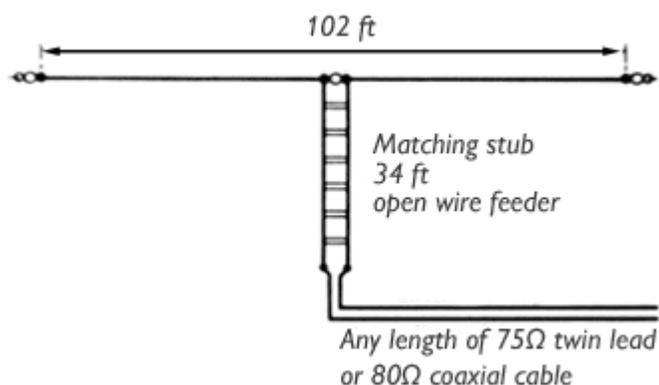
The ZS6BKW is a simple, multiband antenna that can be built from copper wire and a length of open wire feeder. The story behind this improved G5RV has been told before, but it is worth revisiting — this time with computer modeling to back up the performance claims — plus details of a new “Junior” version.

The original G5RV

The G5RV antenna was first described by **Louis Varney, G5RV (SK)** in the July 1958 edition of the *RSGB Bulletin*, journal of the Radio Society of Great Britain. Ten years earlier, the Marconi-trained engineer had faced the problem of fitting multiple antennas for the HF bands into limited yard space at his Chelmsford home. The solution was a three half-wave ($3\lambda/2$), center-fed doublet for 20 meters — his favorite band. The radiating element is a **102 foot** long horizontal wire dipole, fed in the middle through a matching stub consisting of **34 feet** of open wire feeder. The remainder of the transmission line, attached to the end of the matching section, could be any length of low-impedance **75 ohm** balanced-twin or **80 ohm** coaxial cable — as used in the 1950’s-60’s.



Louis Varney, G5RV.



G5RV antenna as described by Louis Varney in the *RSGB Bulletin* July 1958 and *Radio Communication*, July 1984.

That 34 feet of open wire feeder is intended to act as an electrical **half-wave** transmission line on 14 MHz / 20 meters, so the 90 ohm feed impedance at the center of the $3\lambda/2$ wire dipole is transformed to the same 90 ohm value at the end of the $\lambda/2$ matching section. As a result, the design provides a reasonable match on 14 MHz when fed with 75 or 80 ohm cable.

As an alternative to open wire feeder, G5RV suggested using 300 ohm ribbon (velocity factor 0.82) or the “windowed” version (vf 0.9) for the matching section. Mechanical length of the windowed 300 ohm ribbon would then be $34 \times 0.9 = 30.6$ ft.

On 20 meters there is some antenna gain from the lobes of this long-wire antenna — 3.44 dBi compared with 2.14 dBi for a free-space dipole. On 80 meters, the G5RV antenna looks like a shortened half-wave dipole — normal length around 132 feet — with the center portion ‘folded up’ into the 34 ft matching stub.

The antenna will radiate on other bands, but as G5RV pointed out (*RadCom* July 1984) the only band with a good match to 75-80 ohm feeder is 14 MHz, so an antenna matching unit will be required for the other amateur bands.

Let’s model

To find out just how well the G5RV antenna is matched on today’s HF bands, I carried out computer modeling using MMANA-GAL. This free software has been described previously, see *PCARA Update*, June 2015, p 6 “A novel model”.

I set up a model for the antenna with dimensions according to the article by Louis Varney in *Radio Communication*, July 1984. G5RV specified two lengths of 14 SWG copper wire for the dipole, each leg 51 feet long (15.54 m), with a vertical matching section of 16 SWG open wire feeder 34 feet long (10.36 m). Wire spacing for the open wire feeder was 2 inches (5 cm). Those ‘14 SWG’ and ‘16 SWG’ figures refer to British ‘Standard Wire Gauge’, corresponding to wire diameters of 2 mm and 1.6 mm.

Nowadays, the G5RV antenna is most likely to be fed with **50 ohm** coaxial cable rather than 75-80 ohm feeder. Here are **voltage standing wave ratios** referenced to 50 ohms, plus gain figures in dBi, including ground reflections, as calculated by MMANA-GAL. Antenna height is 50 feet above real ground.

G5RV antenna, 102 ft wire, 34 ft matching section

Freq MHz	SWR	Gain dBi
3.65	7.0	6.58
7.15	9.77	6.34
10.12	60.6	9.77
14.15	3.76	8.32
18.12	35.2	8.44
21.20	10.1	9.01
24.94	4.56	9.94
29.00	65.6	10.32
50.15	16.8	11.66

Note how the SWR varies from band to band. A modern transceiver with internal ATU capable of matching SWRs < 3:1 or 4:1 might only find a suitable match on the 20 meter band, 14 MHz. An external tuner with wider matching range would be needed for the other bands.

If the same G5RV antenna is fed with 100 feet of RG-213 coaxial cable — as used on previous PCARA Field Days — losses in the coaxial cable mount up, especially at high SWRs and higher frequencies. The following **total line losses** were calculated by ARRL's "Transmission Line Program for Windows" using impedance values ($R + jX \Omega$) from MMANA-GAL.

G5RV antenna 102 ft wire dipole, 34 ft matching section

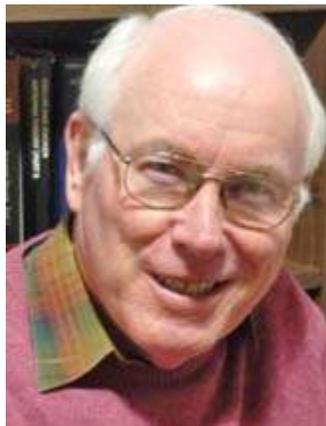
Freq MHz	R Ω	jX Ω	Total line loss
3.65	22.4	70.9	1.09 dB
7.15	101.3	-193	2.03 dB
10.12	74.2	465.7	7.33 dB
14.15	98.2	-87.2	1.41 dB
18.12	179.1	-529.9	6.79 dB
21.20	62.4	159.7	3.35 dB
24.94	162.7	-99.4	2.15 dB
29.00	2929	746.8	9.98 dB
50.50	121.4	291.5	6.22 dB

Line losses on 3.5, 7, 14 and 24 MHz are reasonable. On the other five bands, line losses become significant — for example 81% of output power is lost in the coax on 10 MHz and 90% on 29 MHz. Line losses also *reduce* SWR measured at the transceiver end of the 50 Ω cable, for example from 9.7:1 to 6.1:1 on 7 MHz.

A better solution for bands with high SWR would be to move the antenna tuner to the *end* of the open wire section — as suggested by G5RV himself.

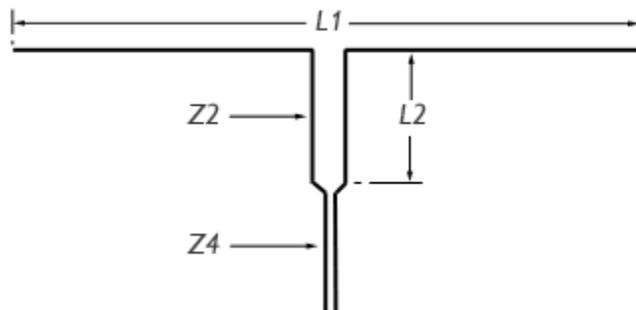
Improvements from ZS-Land

In the early 1980's Dr. Brian Austin, ZS6BKW was senior lecturer in Electrical Engineering at the University of Witwatersrand, Johannesburg, South Africa. Brian wanted to modify the G5RV antenna so it would provide a reasonable match for solid-state transceivers of the 1980's designed for a 50 ohm load resistance and a maximum SWR of 2:1. Writing in *RadCom* Technical Topics, May 1982, he states: "The G5RV represents a clever idea and has, I feel, some unexplored potential. To investigate it further I wrote a program in BASIC for the Data General Eclipse machine in the department."



Brian Austin ZS6BKW, GØGSF. [Pic credit Liverpool Uni.]

Brian's computer program varied the length of the horizontal wire radiator, length of the matching section and the feeder impedances in order to provide an SWR of less than 2:1 on as many amateur bands as possible — including the then new WARC-79 bands. A sufficiently low SWR would allow solid-state transceivers to operate *without* an antenna tuning unit.



ZS6BKW antenna is similar to the G5RV, with horizontal dipole length ($L1$) decreased and open wire matching section length ($L2$) increased. $Z2$ is impedance of the matching section, $Z4$ impedance of the main feeder.

Initial results suggested that shortening the G5RV top length $L1$ to 27.9 meters (91 ft 6 in) and increasing the matching section length $L2$ to 13.6 meters (44 ft 7 in) with 400 ohm impedance would provide a match to 50 ohm coax on five bands: 7, 14, 18, 24 and 29 MHz. (These suggested lengths are not yet corrected for wire end-effects or cable velocity factor.)

Brian Austin authored a full-length article "Computer-aided design of a multiband dipole — based on the G5RV principle" in *RadCom* for August 1985. He explained the computer-optimization process and provided charts showing satisfactory combinations of wire lengths and matching section impedances that would provide low SWR on five amateur bands with 50 ohm coax ($Z4$). Dipole top lengths ($L1$) ranged from 27.7 to 29.4 meters, matching section lengths ($L2$) varied from 13.7 to 12.8 meters while matching section impedances ($Z2$) ranged from 275 ohms to 400 ohms.

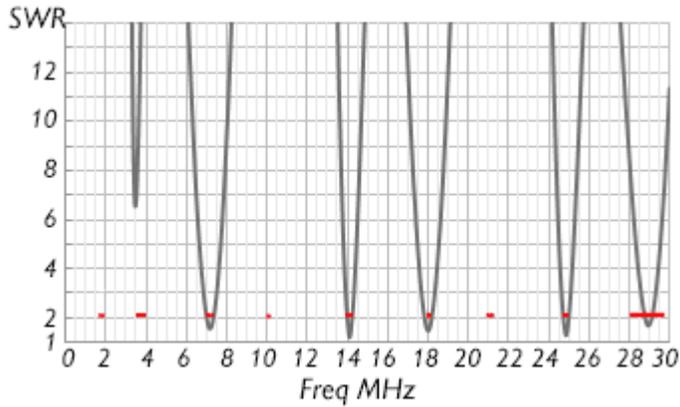
One suggested design has a top wire length of 28.6 meters (93.8 ft), and a 400 ohm matching section with length of 13.4m (43.96 ft — not yet corrected for velocity factor). Running these dimensions through the MMANA-GAL modeling software using a height above real ground of 48 ft reveals a good match to 50 ohms on **five HF bands plus** 6 meters as shown below:

ZS6BKW antenna, 93' 10" dipole, 43' 11" matching section

Freq MHz	SWR	Gain dBi
3.65	10.7	6.65
7.15	1.56	6.02
10.12	82.2	8.76
14.15	1.35	9.48
18.12	1.72	8.77
21.20	61.7	9.08
24.94	1.63	9.43
29.00	1.71	9.99
50.50	2.29	11.51

The match is good — less than 2:1 — on the 7, 14, 18, 24, and 29 MHz bands and still acceptable on 50 MHz. Here is an Excel-generated graph based on MMANA-GAL data showing the low-SWR ranges falling into **five** of the nine amateur bands between 1-30 MHz,

as indicated by the red bars on the 2:1 SWR line.



SWR (50 Ω) versus frequency for the ZS6BKW antenna.

If we add 100 feet of RG-213 coaxial cable at the end of the open wire matching section — as for the G5RV antenna — then calculate total loss in the coaxial cable using “Transmission Line Program for Windows” the results are as follows:

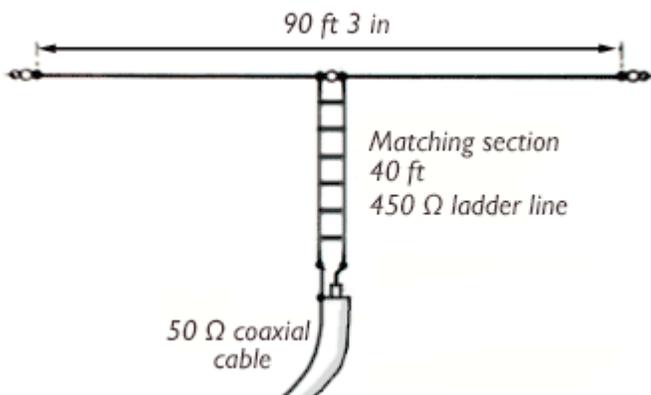
ZS6BKW antenna fed with 100 ft RG-213

Freq MHz	R Ω	jX Ω	Total line loss
3.65	11.27	58.84	1.45 dB
7.15	77.79	-2.522	0.51 dB
10.12	392	1206	7.91 dB
14.15	42.77	11.92	0.73 dB
18.12	71.94	24.37	0.89 dB
21.20	877.1	1391	8.52 dB
24.94	67.44	22.52	1.05 dB
29.00	82.86	11.81	1.16 dB
50.50	93.15	38.8	1.75 dB

Cable losses are negligible for the bands with low SWR. Although the match is not so good on 3.5 MHz, total loss of 1.45 dB in the 50 Ω coaxial line at this low frequency is still acceptable. With an external ATU, 80 meter performance should still be satisfactory. High SWRs and higher line losses (~8dB) on 10 and 21 MHz make the antenna less suitable for those two bands.

Practical ZS6BKW antennas

For my own home-built ZS6BKW antenna, I used a design by Martyn G3UKV published in *Sprat* #129,



Practical ZS6BKW antenna, with dimensions as suggested by G3UKV.

journal of the G-QRP Club. G3UKV employed a top section wire length of 27.5 meters (90 ft 3 in) and a length of 450 ohm ladder line as the matching section. According to DX Engineering, this type of feeder has a characteristic impedance closer to 400 ohms and a velocity factor of 0.91. Using ZS6BKW’s design aids and correcting for velocity factor, physical length of the matching section should then be 12.2 meters or 40 ft.

In my first version of this antenna, I raised the center insulator to a height of 30 feet in the back yard and trimmed the dipole legs for resonance on 40 meters as indicated by an MFJ-259 SWR analyzer. SWR was acceptable on 7, 14, 18, 24 and 28 MHz.

The original dipole was fabricated from 18 AWG wire with orange insulation. It was subsequently upgraded to employ 90 feet of 14 gauge stranded copper wire with black THWN insulation, purchased from Home Depot. The center insulator is an Emtech Ladder Grabber, see <https://steadynet.com/emtech/>. The 450 ohm ladder line runs from center insulator to a generic waterproof connector with SO-239 socket ready for the 50 ohm coaxial cable.



Home-built ZS6BKW antenna using 14 gauge stranded copper wire with black insulation and 450 ohm ladder line.

The main feeder run is then attached through a ferrite sleeve ‘balun’ to reduce RF current on the outer shield of the coaxial cable. Be prepared to trim the dipole wire lengths by up to 5%, depending on the type of plastic insulation covering the copper wire, the antenna height and presence of any nearby objects.

That homebrew ZS6BKW antenna has been employed at several PCARA special event stations — including the 400th anniversary of Henry Hudson’s discovery of the Hudson River, the Hudson Valley Expo at Riverfront Green in 2015 and the 250th anniversary of Old St. Peter’s Church in 2017. This simple antenna was easy to pull up between trees and gave a good account of itself, mostly on 40 meters.



Joe WA2MCR's commercial version of the ZS6BKW antenna.

Joe WA2MCR has a commercial version of the ZS6BKW antenna suspended from trees, 40 feet above ground. For comparison with the previous MMANA-GAL calculations, here are *actual* SWR readings taken at the end of the ladder-line of Joe's ZS6BKW antenna using a 'Funkamateur' FA-VA5 Vector Antenna Analyzer (as reviewed in September *QST!*)

Commercial ZS6BKW antenna at 40 ft high

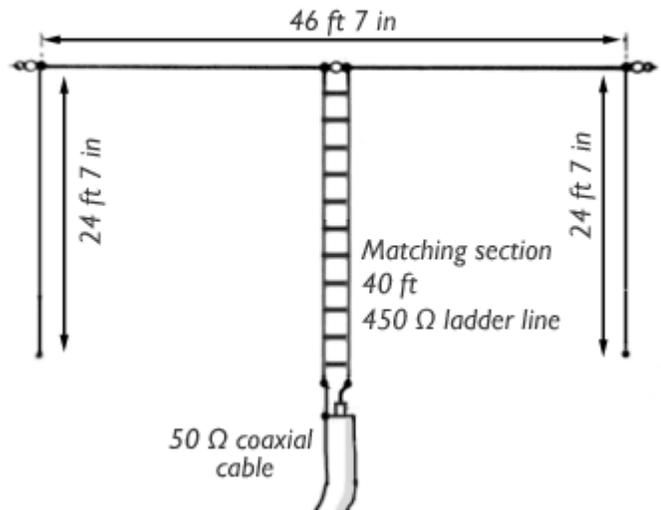
Freq MHz	SWR
3.65	4.68
7.15	1.25
10.12	40.6
14.15	1.35
18.12	1.72
21.20	35.9
24.94	1.49
29.00	2.01
50.50	2.31

ZS6BKW "Junior" version

In 1987 Brian Austin, ZS6BKW moved from South Africa to Northwest England, where he became Senior Lecturer in Electrical Engineering and Electronics at Liverpool University — and acquired UK call G0GSF. He retired from teaching in 2005 but was still thinking about antennas. One concern was that the tiny back yards of Great Britain might be too small to fit in a 90 foot long ZS6BKW antenna. Halving the dimensions of the antenna — as is sometimes practiced with a G5RV — does not lead to a satisfactory solution as the points of low SWR move outside the amateur bands, apart from 10 and 20 meters.

In an article in March 2018 *RadCom* "A compact multiband dipole", G0GSF describes a shortened version of the ZS6BKW antenna which bears a resemblance to the old "Bobtail Curtain". The ends of the 90 foot top section are bent down at 90°, so the horizontal length is roughly halved and the remainder of the wire hangs down vertically at each end. The matching section length is unchanged.

When the horizontal wire is bent down at the ends, overall wire length has to be increased slightly to maintain resonance in the amateur bands. G0GSF rec-



"Junior" version of the ZS6BKW antenna by G0GSF. The ends are folded down to reduce horizontal space needed.

ommends a horizontal width of 14.2 meters (46 ft 7 in) and a vertical length of 7.5 meters (24 ft 7 in), for a total wire length of 29.2 meters or 95 ft 9 in.

I modeled this "Junior" version of the ZS6BKW antenna in MMANA-GAL using the same feeder and height above real ground as the full-size ZS6BKW on previous pages. Results were as follows:

ZS6BKW "Junior" antenna

46' 7" dipole, 24' 7" ends, 43' 11" matching section

Freq MHz	SWR	Gain dBi
3.65	15.2	5.57
7.15	1.43	4.53
10.12	124	4.25
14.15	1.31	2.28
18.12	2.21	5.6
21.20	58	8.21
24.94	2.48	4.04
29.00	1.69	6.48
50.50	2.21	6.79

Once again, the match to 50 ohm coax is good on 7, 14, 18, 24, 29 and 50 MHz. Attaching 100 feet of RG-213 coaxial cable and calculating total line losses using "Transmission Line Program for Windows" gives the following results:

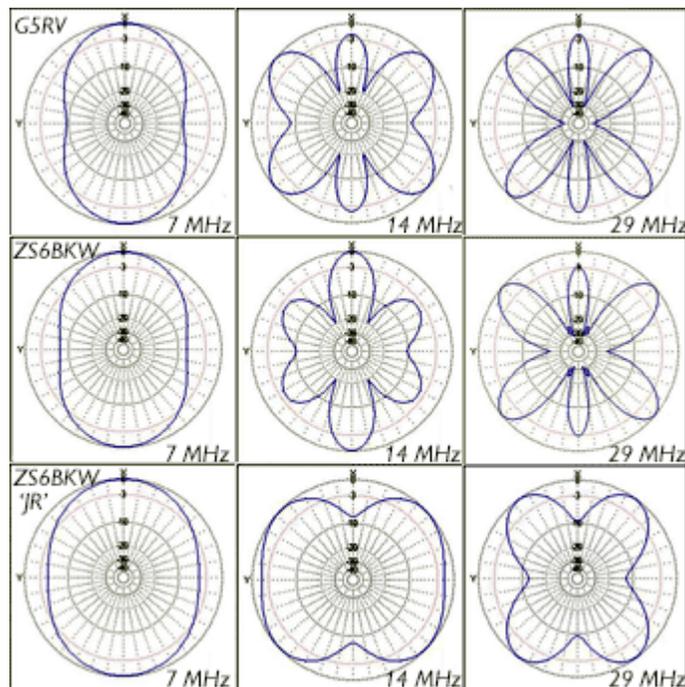
ZS6BKW "Junior" antenna

Freq MHz	R Ω	jX Ω	Total line loss
3.65	7.22	54.37	2.11 dB
7.15	48.09	-17.65	0.58 dB
10.12	302.2	1338	10.03 dB
14.15	65.36	0.66	0.80 dB
18.12	110.2	4.04	1.14 dB
21.20	844.1	1316	8.83 dB
24.94	122.0	13.91	1.44 dB
29.00	80.68	14.29	1.29 dB
50.50	110.4	.0003	1.94 dB

As before, total line loss is quite acceptable on all bands except for 10 and 21 MHz. An external tuner would be required on 3.5 MHz because of high SWR.

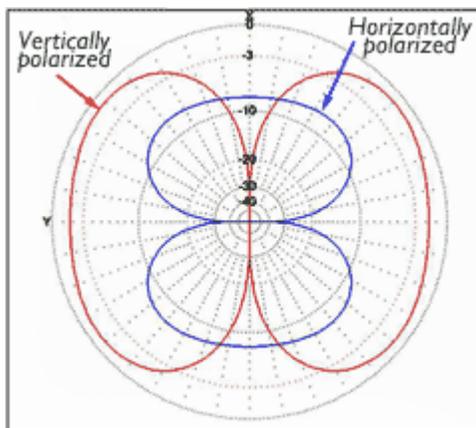
Antenna patterns

One aspect of these doublet antennas is that their radiation patterns tend to be bidirectional on the lower frequencies — similar to a half-wave dipole — then as the frequency increases, the pattern breaks up into multiple lobes with deep nulls in between. You might want to orient this type of antenna with lobes pointing toward your favorite compass bearings for DX.



Antenna patterns in the horizontal plane as predicted by MMANA-GAL for the G5RV (top row), ZS6BKW (mid) and “Junior” version of the ZS6BKW (bottom) at 7, 14 and 29 MHz. Antenna wires run ‘left-to-right’ on the Y axis.

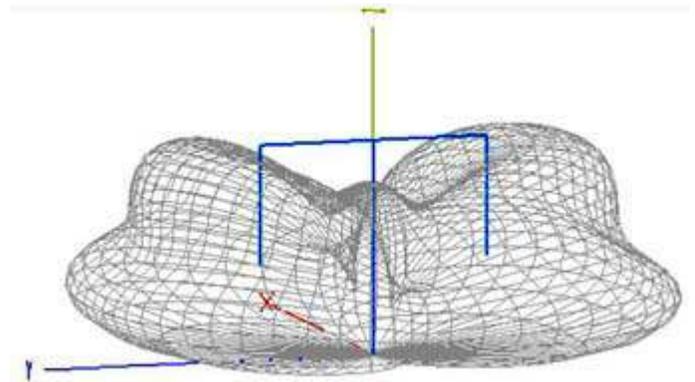
Radiation patterns become more interesting if the horizontal and vertically polarized components are examined separately. The G5RV and ZS6BKW designs radiate mainly horizontal polarization on all bands from their horizontal wire elements. However, the ZS6BKW “Junior” with its wire ends bent down radiates more vertically-polarized RF energy. On 3.5 MHz overall radiation is still broadside to the dipole. As the frequency



Antenna pattern of the ZS6BKW “Junior” antenna on 14 MHz, showing vertically polarized radiation from the folded down ends (red) and horizontal polarization from the horizontal wire (blue).

increases, vertical radiation from the folded-down ends becomes more important, so the antenna is nearly omnidirectional at 7 MHz. On 14 MHz, the pattern becomes predominantly end-on to the horizontal wire. G0GSF observes that: “The 14 MHz case is particularly interesting. The antenna actually performs as an end-fire array by producing two broad lobes off its ends with their maxima at 40° to the wire at either end... This rather fortuitous situation leads to the very acceptable low angle of radiation of just 15°.”

The antenna acts like a pair of inverted vertical antennas, fed out of phase at the top and spaced almost $3\lambda/4$ apart. G0GSF’s “Junior” design was field-tested with assistance from Chester & District Radio Society and produced very satisfactory results on the HF bands.



Three-dimensional antenna pattern for ZS6BKW “Junior” antenna on 14 MHz as predicted by MMANA-GAL.

Additional resources

“An Introduction to Antenna Modelling” book by Steve Nichols, G0KYA, RSGB Publications, 2014. Includes MMANA-GAL models for G5RV and ZS6BKW antennas.

YouTube Interview with Brian Austin, G0GSF:
<https://youtu.be/EypzupYh3uW>

‘Transmission Line Program for Windows’ by Dean Straw N6BV, included with ARRL Antenna Book, 2000-
 Earlier article on the ZS6BKW antenna: *PCARA Update* July 2009, p 6 “BKW multiband antenna”.

Earlier article on MMANA-GAL antenna modeling software: *PCARA Update*, June 2015, p 6 “A novel model”.

- NM9J

Lockdown leakage

Which handi-talkie?

My everyday handi-talkie is a Yaesu FT-70D. Equipped with a lithium-ion battery pack, the unit needs to be recharged roughly once a week. I also have a couple of older Icom HTs — the IC-W32A and IC-Z1A. They are heavier than the FT-70D, with bulky nickel-metal hydride batteries, but they have some advantages over the Yaesu HT and come out from time to time. The Icom IC-Z1A has an “Extra-Low” power setting that produces 15 *milliwatts* output instead of the usual 3-5 watts. This can be useful for testing sensitivity of local repeaters.

That last capability made me pick up the Icom IC-Z1A recently to provide a weak signal. Sad to say, when I pressed the transmit button, the display went blank — the battery was exhausted and the spare battery was in a similar state. The IC-W32A had also run down. What had gone wrong?

Spring schedule

In a normal spring, my Icom handi-talkies would have been brought out for the following events:

- Easter Sunday co-ordination at Church of the Holy Spirit
- Orange County ARC Hamfest
- Bergen ARA Hamfest,
- PCARA Foxhunt.

Before use, I would charge each radio's NiMH battery and spare battery pack. This year, all four listed events were canceled or rescheduled — so my Icom handi-talkies had been standing idle since *Christmas Eve*. Traditional nickel-metal hydride battery packs slowly self-discharge, losing 10 – 15% of their capacity every month. The IC-Z1A places an additional load on the battery to keep its built-in clock ticking.

Internal leakage and steady drain explain why the battery packs had run down after several months — and why newer radios now employ less leaky technologies such as lithium-ion.

Time to recover

I tried to recharge the NiMH battery packs for both transceivers — then ran into difficulties. The voltages had fallen so far that neither radio would start charging when placed in the Icom BC-119 drop-in charger.



Icom IC-Z1A in BC-119 charger.

Ray of hope

I remembered a strategy from previous NiMH problems. In the basement I had a Maha



Maha MH-C777 Charger/Conditioner, purchased long ago at a PCARA Bring & Buy sale from Ray W2CH. The Maha unit has a discharge/charge capability designed to bring NiCd and NiMH battery packs back to life. It can discharge a dubious battery pack into a resistive load down to a safe voltage, then recharge the pack while monitoring voltage and temperature to avoid overcharging.

After subjecting one of the battery packs to three cycles of discharge and charge, I was happy to see that the nominal voltage of 7.2V had been restored. I repeated the procedure for the other NiMH packs until they were all showing correct voltages when charged.

Note: if you have a device that takes *rechargeable AA-cells*, modern nickel-metal hydride batteries with low-self-discharge technology — such as Sanyo/Panasonic's “Eneloops” — can retain up to 70% of their charge after 10 years in storage. See *PCUD*, November 2013, “Battery day”.

A new hope

To be on the safe side, I ordered two new battery packs from “Batteries America” in Wisconsin, <https://batteriesamerica.com/>. 1½ weeks later, the new packs arrived. Terminal voltages were correct, so I gave them an initial top-up charge in the Icom drop-in charger and monitored voltages for several days.

Pause for thought

Do you have any battery-powered equipment that has not been used in a while — perhaps because of the COVID-19 lockdown or other reasons? Think about: handi-talkies, scanners, cameras, camcorders, remote controls, weather stations, clocks, calculators, flashlights, test-meters, GPS, notebooks, tablets... or anything else that is not permanently powered by an external supply of 120 V AC or 12 V DC.

Take a moment to check the state of batteries in your portable devices, especially items that are stored out of sight. The internal power source might be alkaline AA or AAA cells, or a NiMH or Li-ion battery pack. If volts are low, replace or recharge *now*. Spare batteries should also be recharged and rotated. Watch for signs of decay such as white powder surrounding the battery case or corrosion around the contacts. Use Deoxit® to clean up any corrosion.

- NM9J

Peekskill / Cortlandt Amateur Radio Association

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

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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 the first Sunday of each month (apart from holidays and July/August break). Talk-in is available on the 146.67 repeater.

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 are required

Sun Sep 13: PCARA monthly meeting, John C. Hart Memorial Library, 1130 E Main St., Shrub Oak. 3:00 p.m. outdoors. Bring your own chair.

Sat Sept 26: PCARA Breakfast, 9:00 a.m. Downing Park Pavilion, Rt. 202, Yorktown.

Sat Sept 26: PCARA VE Test Session, John C. Hart Library, 1130 E Main St., Shrub Oak. 11:00 a.m. outdoors. Bring your own chair.

Hamfests (Check before leaving!)

Sun Oct 4: Orange County ARC Hamfest, Town of Wallkill Community Center, 2 Wes Warren Dr., Middletown, NY. 8:30 a.m.

(Sat Oct 10: Canceled - Bergen ARA Fall Hamfest.)

Sun Oct 25: LIMARC Hamfest, Levittown Hall, 201 Levittown Parkway, Hicksville, New York. 9:00 a.m.

VE Test Sessions

See ARRL's web site for upcoming V.E. Test Sessions (http://www.arrl.org/exam_sessions/search) and **check** with the named Contact before leaving.

Sep 10: WECA, Westchester Co Fire Trg Center, 4 Dana Rd., Valhalla, NY. 7:00 p.m. Contact S. Rothman, (914) 949-1463.

Sep 18: Orange County ARC, Munger Cottage, 183 Main Street, Cornwall NY. 6:00 p.m. Contact Joseph J. DeLorenzo (845) 534-3146. **Call Ahead.**

Sep 26: PCARA, John C. Hart Memorial Library, 1130 E Main St Shrub Oak NY. 11:00 a.m. Contact Michael Dvorozniak (914) 488-9196. **Call ahead.**



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