

THE YCARS TRANSMITTER



Ham Radio News, Events and Information

YCARS Club House - 2051 Squire Rd. Rock Hill, SC 29732 – Mailing Address YCARS PO Box 4141 C.R.S., Rock Hill, SC 29732

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December 2021 Club Activities

- Every Wednesday 18:00 local – Club open House
- Thursday, Dec. 2, Radio Room Operating Night and NWS presentation 18:00-20:00
- Friday, Dec 3rd Rock Hill Christmas Parade Aux Comm for RHPD
- Saturday Dec 4th, Skywarn Appreciation Day /Chili Cook-off Clubhouse 13:00- 18:00
- Thursday, Dec.9, Christmas Party Catawba Baptist Church 19:30
- Friday Dec.10 – Monthly Simplex Net – 21:00

2021 YCARS Officers

- PRESIDENT – W3SPC STEVE CZAIKOWSKI
- VICE PRESIDENT – KM4WLS PHILIP CHANDLER
- TREASURER – K4DQP DARCY PACH
- SECRETARY – KN4KCD RON PRYOR
- CUSTODIAN – KD4RNP WAYNE REEVES
- TRUSTEE – NJ4Z JOHN GENDRON

YCARS Net Schedule

- 2 Meter Morning Net Weekdays Mon-Fri 11:00 K4YTZ Repeater 147.030MHz (-) pl 88.5
- 2 Meter Evening Net Weekdays Mon-Sun 20:30 K4YTZ Repeater 147.030MHz (-) pl 88.5
- ARES 2 Meter Weekly Net Mondays 19:30 K4YTZ Repeater 147.030MHz (-) pl 88.5
- Monthly Simplex Net – 2nd Friday of the month 21:15

Welcome to the YCARS TRANSMITTER

Vol.1 No.12 December 2021

Hello everyone,

First off, we want to wish everyone a very happy, healthy and safe holiday season.

This month, in the transmitter, NJ4Z reflects on 2021 in the "From the Hamshack with NJ4Z" column. Contesting, Awards and mentoring were the highlights.

'Twas the Night before Christmas and all through the shack, we have the Ham's Night Before Christmas courtesy of Gary Pearce, KN4AQ a huge thank you to Jeff KA4WYC for submitting that jewel to the Transmitter.

Moving from the shack to the great outdoors and the seashore to be exact, Darcy K4DQP details his POTA activation on the grounds of the historic and world-famous Cape Hatteras Light House.

NJ4Z details a recently built project to allow for more gain using phased vertical antenna arrays.

And as always, we have the Boneyard, and YCARS AWARE. Please consider writing and article for the newsletter, as the saying goes, "Many Hands Make Light Work,"

We would also like to thank those who contributed this month to the Transmitter.

Until next month, We wish you all a Very Merry Christmas, Happy New Year and Much DX....

73

The Transmitter Staff

DEC 2021 Contest Calendar

12/3 – ARRL 160M -
Contest (CW/SSB)
22:00UTC

12/4 – Ft Roundup
(digital) 18:00UTC

12/11 – ARRL 10M
Contest (CW/SSB)
00:00UTC

12/18 – RAC Winter
Contest (Canadian)
00:00 UTC



From NJ4Z's Hamshack

Musings from the Editor

Here we are at the end of 2021, "Wow! What a long strange trip it has been..."

As I look back on my first year as editor of the YCARS Transmitter, I have to say, I am very proud of what was produced this year and very thankful for all those who contributed to the effort. I want to thank each of those who contributed an article and especially Joe, W8DRK his Octogenarian Observations column was wonderful for 2021. He did an amazing job providing content for the year. We will miss the column next year as Joe is stepping away from writing the column to try some different endeavors.

As I reflect on 2021, the best part of the year was sharing the experiences with the club and good friends. I received a great amount of joy by helping mentor several new hams, and had an immense amount of gratitude to others for mentoring me this year. During 2021, I managed to earn some individual accomplishments and I was able to compete at a high level in several contests. I managed to earn two Kilo awards and several other POTA awards. I eclipsed 1000 prefixes worked for CQ WPX and am on the honor roll for both SSB and Mixed. I completed in my first CQ WW DX CW contest, which was amazing, especially since I am not proficient at CW. That contest lit a fire in me... so look out going forward.

The most amazing highlight for 2021 was being part of the team that earned the POTA "Support Your Parks" plaque for the club and Team K4YTZ. It was nothing short of an amazing experience. That weekend will be with me the rest of my life. I cannot thank my teammates W3SPC and K4DPQ for sharing the experience and giving me the opportunity. Another amazing experience for 2021, was YCARS ARRL Field Day, to see new operators like Vicki W4NQX, Steve KO4GSM and many others live that first Field Day is something that I will treasure. I was in awe watching this club blossom in 2021 under the leadership of Steve W3SPC, Hillary AB1CD, Darcy K4DQP, Andre W3PAL, Daniel WD2DW, David KX4UV, Tim K6FNV and others. I can only imagine what 2022 will hold.

Looking forward to 2022, I am so excited for Cycle 25 as we continue towards sunspot maximum and the sun provides super propagation and great DX opportunities. I am also excited and hopeful for the return of DXpeditions as the pandemic finally ends.

I have so many HAM goals set for 2022, it may be impossible to achieve them all, but it will be one hell of a ride trying to get there.

I would be remiss if I did not thank all of you for being part of our club and reading this newsletter, it is a pleasure working on this project.

So, until next month, Have a safe and Happy Holiday Season, Merry Christmas, Happy New Year. Stay healthy, safe and of course, passionate about Amateur Radio... 73 - NJ4Z out

John Gendron, NJ4Z - Editor, YCARS Transmitter

A Ham's Night Before Christmas

Yet another corruption of Clement Clarke Moore's classic Christmas tale,
this time distorted by Gary Pearce KN4AQ
December 2, 1996

'Twas the night before Christmas, and all through two-meters
Not a signal was keying up any repeaters.
(full poem text below)

That line, adapted from the famous poem A Visit from St. Nicholas by Clement Clarke Moore, had been floating around in my head for years. I always intended to do something with it, and in December, 1996, I finally did. With some help from KE4FCJ and AC4ZO, I wrote the rest of the Ham's Night version of the poem. I stayed more or less true to the original for the first few stanzas, but then it took on a life of its own. It only took an hour or two to write (that's fast, for those of you who think this is easy). I'm kind of proud how few of the rhymes and cadences had to be tortured to fit. If you look up some of the dozens (hundreds? thousands?) of other versions of the poem that have been written, you'll see what I mean. Most are painfully contorted. And it seems that the original poem has been adapted to cover just about every group, activity and occasion you can think of.

I performed the poem live at a few radio club meetings, and it was well received (especially the line about Wayne Green). I put the text on the web, and it found its way into dozens of club newsletters and web sites. Some of them even gave me credit!

In 2003, I recorded an audio version at the SoundTrax studio in Raleigh NC, where I freelance. That ran on Newsline and ARRL Audio News. I'd been thinking of adding music to the poem, and experimented with a few tracks (Silent Night, Little Drummer Boy), but nothing really fit. In 2010, Don Merz WA3AYR, another SoundTrax freelancer, recorded himself playing a medley of Christmas music on guitar, and gave us all a copy. When I heard Don's medley, I knew this was the one. I adjusted the tempo of the poem just a little to fit the bars of the music, and made just one edit in the music to make it time out (had to add a few seconds). But mostly it was an amazing fit.

Next, the movie... er, video. Where to get pictures? I thought about asking an illustrator or cartoonist to draw some custom pictures. But that would be a big project, and I didn't know anyone well enough to beg that much work. Animation? Live action? Way too much work. Next thought: QST covers. Every year the December issue has a Christmas or holiday theme. I asked the ARRL for permission to use them, and it was quickly granted. Only problem was that as I began to edit, I realized that there weren't nearly enough covers to do anything more than make them "wallpaper." And I was starting to want images that were appropriate for the line of the poem they would be shown against. As I browsed the old QST's, I noticed that a lot of ads also had Christmas and Santa artwork. I selected a big handful of ads and a few Gil cartoons, went through another round of permissions (from companies that were still in business, and nobody turned me down) and finally I had my images. Again, I didn't need to torture the concept too much to make the pictures fit the narrative. Almost every line is covered by something that works, and some of them are brilliant. I put the video on YouTube in December 2010, and watched the hit counter climb. In 2011, I made a special version for the ARRL, and that took off as well. (The link will take you to a page where you'll also find the text and audio versions with and without music — you can play the 'no music' version on the air!)

In 2012, it was time for a High Definition version. Rebuilding the project was fairly easy (but still a full day's work). Sometimes, though, things looked a little too good. I added some transparency to the titles showing the year and logo of each image so they didn't stand out so much. And I made my own HAMRADIONOW 'bug' almost invisible.

And on the 20th anniversary of the poem, in 2016, I went back to the roots and recorded myself reading it 'live' to the camera, and mixed that in with the classic QST covers, ads and cartoons. That became HamRadioNow Episode 283.

Yes, it's a Christmas poem. But I offer it in the spirit of the holiday season to all, whatever you believe or celebrate. In a troubled world, this is a time when we remind ourselves that peace is the goal. I hope we find it soon.

You have my blanket permission to copy, reproduce, publish, embed, steal, lift, improve, revise and otherwise re-use the text and audio. The images are not mine to give away, but feel free to link to and embed the video on your web site. 73, Gary KN4AQ

'Twas the night before Christmas,
 And all through two-meters,
 Not a signal was keying up
 Any repeaters.
 The antennas reached up
 From the tower, quite high,
 To catch the weak signals
 That bounced from the sky.
 The children, Technicians,
 Took their HT's to bed,
 And dreamed of the day
 They'd be Extras, instead.
 Mom put on her headphones,
 I plugged in the key,
 And we tuned 40 meters
 For that rare ZK3.
 When the meter was pegged
 By a signal with power.
 It smoked a small diode,
 And, I swear, shook the tower.
 Mom yanked off her phones,
 And with all she could muster
 Logged a spot of the signal
 On the DX PacketCluster,
 While I ran to the window
 And peered up at the sky,
 To see what could generate
 RF that high.
 It was way in the distance,
 But the moon made it gleam -
 A flying sleigh, with an eightelement
 beam,
 And a little old driver
 Who looked slightly mean,
 So I thought for a moment
 That it might be Wayne Green.
 But no, it was Santa,
 The Santa of Hams,
 On a mission this Christmas
 To clean up the bands.

He circled the tower,
 Then stopped in his track,
 And he slid down the coax
 Right into the shack.
 While Mom and I hid
 Behind stacks of CQ,
 This Santa of hamming
 Knew just what to do.
 He cleared off the shack desk
 Of paper and parts,
 And filled out all my late
 QSLs, for a start.
 He ran copper braid,
 Took a steel rod and pounded
 It into the earth
 Till the station was grounded.
 He tightened loose fittings,
 Resoldered connections,
 Cranked down modulation,
 Installed lightning protection.
 He neutralized tubes
 In my linear amp... (Never
 worked right before -
 Now it works like a champ).
 A new low-pass filter
 Cleaned up the TV.
 He corrected the settings
 In my TNC.
 He repaired the computer
 That wouldn't compute,
 And he backed up the hard drive
 And got it to boot.
 Then, he reached really deep
 In the bag that he brought,
 And he pulled out a big box.
 "A new rig?" I thought!
 "A new Kenwood? An Icom?
 A Yaesu, for me?
 An Elecraft, TEN-TEC
 Or Flex, could it be!"
 (If he thought I'd been bad
 It might be QRP!)

Yes! The Ultimate station!
 How could I deserve this?
 Could it be all those weekends
 I worked Public Service?
 He hooked it all up
 And in record time, quickly
 Worked 100 countries,
 All down on 160.
 I should have been happy.
 It was my call he sent.
 But the cards and the postage
 Will cost a month's rent!
 He made final adjustments,
 And left a card by the key:
 "To Gary, from Santa Claus.
 Seventy-Three."
 Then he grabbed his HT,
 Looked me straight in the eye,
 Punched a code on the pad,
 And was gone - no good bye.
 I ran back to the station,
 And the pile up was big.
 But a card from St. Nick
 Would be worth my new rig.
 Oh, too late, for his final
 Came over the air.
 It was copied all over.
 It was heard everywhere.
 The Ham's Santa exclaimed
 What an old ham expects:
 "Merry Christmas to all,
 And to all, good DX."

© 1996, 2016 Gary Pearce
 KN4AQ
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K4DQP Activates the Cape Hatteras National Seashore (POTA)



I recently returned from my annual Guys Fishing Trip to the Outer Banks. This year, I decided to bring along my Icom 7300 and my DX Commander and activate the Cape Hatteras National Seashore (K-0682). Unlike most of my other activations, this one was a short one, but a great experience nonetheless.

Overall, I made 119 contacts in just over an hour and a half. I activated on both 40M and 20M and I managed to log 8 different countries and 32 states, including three club members from YCARS: NJ4Z

(John), KZ1H (Harry) and KF4QXW (Walt, who always manages to find me at a park).

Some lessons learned and tips for this kind of activation...

1. National Parks are federally protected treasures, and probably better to ask permission than forgiveness with the NPS before attempting to hang antennas, put stakes in the ground, or anything that may cause suspicion or alarm. I contacted the head park ranger at the park two months in advance. It turns out that he was well acquainted with POTA and made accommodations for my activation, including suggesting good spots to set up.
2. Know the details. Research the grid square, county, POTA park number and a few interesting facts about the place where you will be. You may be asked for any of these details while doing your activation. Sharing a few facts about the park keeps the activation interesting. Remember, there are people who are homebound or can't get out and activate themselves. Describing your activation and surroundings makes the qso more interesting and fun for both operators.
3. If paper log, note the dates, times, bands, etc. You will have to transfer these into an electronic format to submit to LOTW, QRZ and POTA. Ensuring you have the correct details is paramount to getting and giving credit for a qso.
4. Know your equipment. Being an efficient and effective operator means knowing how to pack, unpack and operate your equipment. Learning on the fly and fixing issues is time consuming and takes away from making contacts.

5. Take a friend. An older novice operator (license expired) asked to tag along during my activation. He assisted in helping me set up enjoyed listening to the activation. I think he may have been inspired to renew his license.

Well, that's it from K-0682. I'll see you at the next park!

De K4DQP

THE WORKBENCH

Ham Radio Projects, Tricks and Tips

The NJ4Z Phased Array Relay Network and Controller – “A Simple Way to Get Big Gain from Multiple Vertical Antennas.” – John Gendron, NJ4Z

Most of the Hams in our club realize, I am a huge fan of vertical antennas. I love to experiment with them. In 2019, I saw a video by Callum McCormick, M0MCX – The DX Commander. It was a three-element triangular parasitic array for 40meters. The design was derived from a 1978 article in CB Magazine. You have three elements of equal length arranged in an equilateral triangle quarter-wavelength ($1/4\lambda$) on each side of the triangle. At each corner of the triangle, a quarter-wave ($1/4\lambda$) vertical element is placed (3 in total). At each element a radial field is placed containing two wavelengths of radials for the operating band. Two of the elements are fed with equal lengths of 50ohm coax via a tee piece connected to the radio via 50ohm coax. The third element is shorted between the vertical and the radial field, effectively making it a reflector. (See figure 1 for construction of the antenna)

So, I was intrigued by this design and it seemed simple to build, straight forward. So,

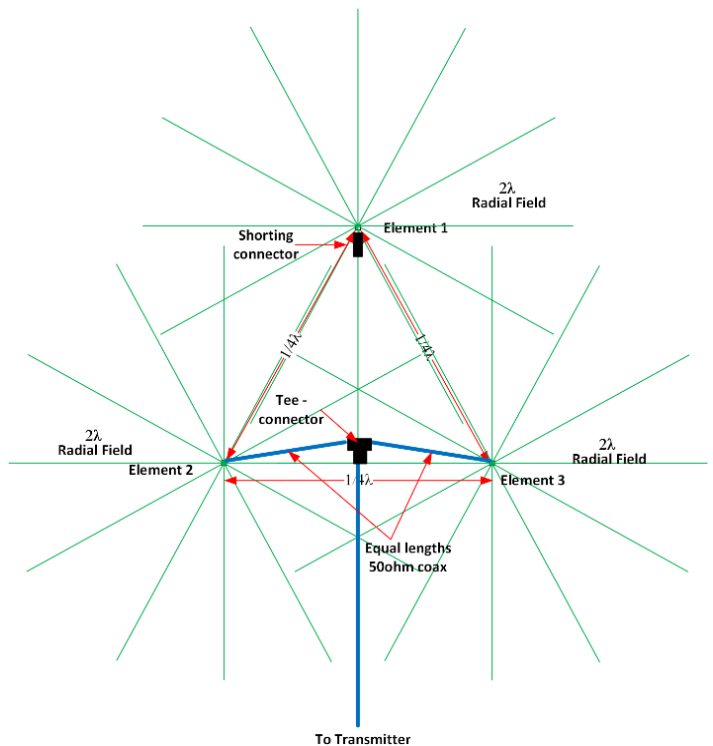


Figure 1 - Triangular Vertical Array

I built one for 40meters. We tested it out the night before field day 2019. The darn thing was a monster. In theory and in the MMANA model we were looking at 5.6dBi of gain over an isotropic antenna, offering 4.2dB of gain over a single vertical antenna, essentially 2.63

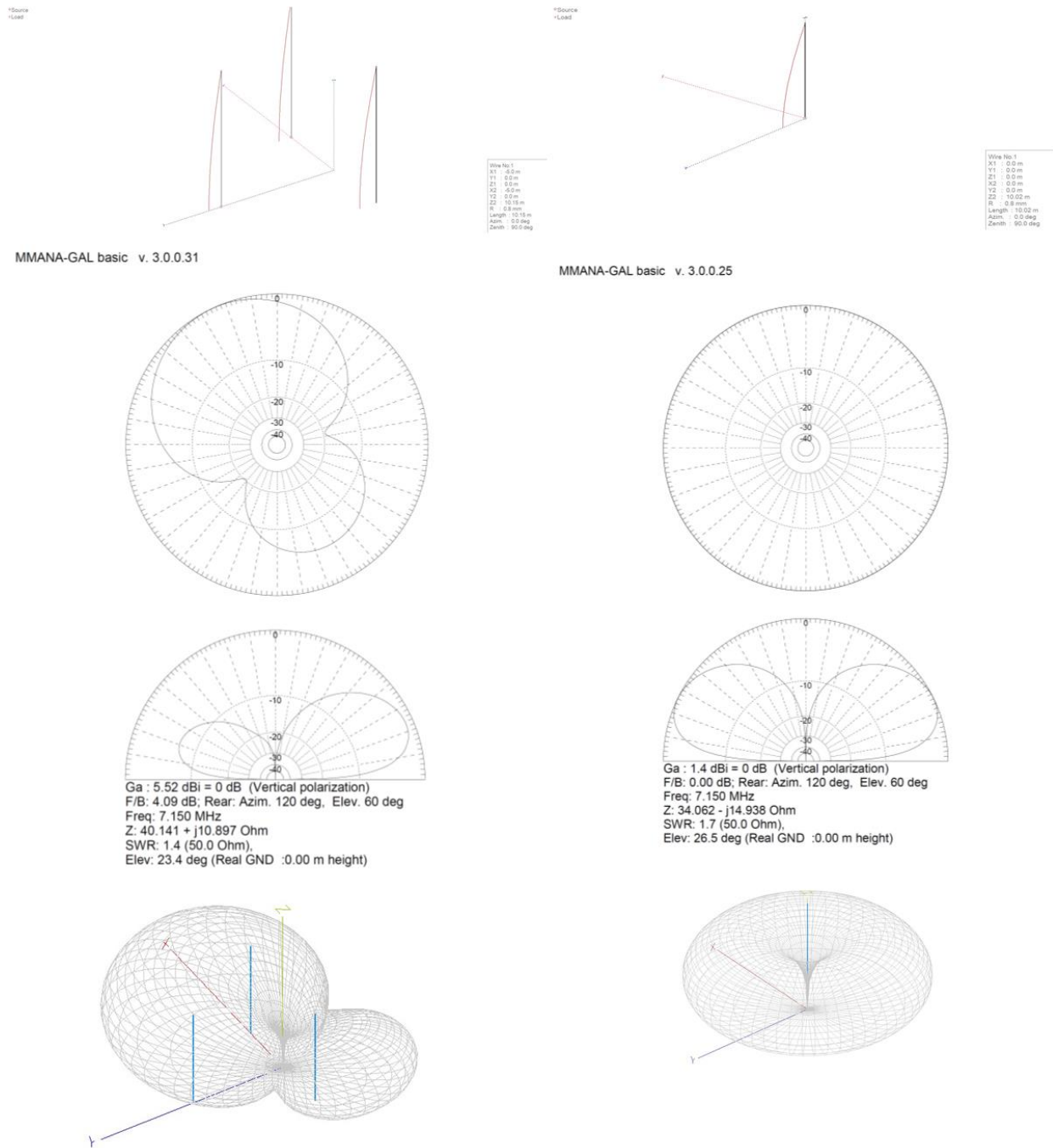


Figure 2 - Triangle Array vs. Single Vertical

times the radiating power in a specific direction. Thus a 100-watt signal would produce 263 watts in a specific direction. (See figure 2 for comparison of the two antennas' far field plots)

As designed the parasitic array could be rotated by moving the fed points and the shorting connector. The rotation of the antenna would give you equal lobes of 100deg of bandwidth on 120deg opposing headings. You would have physically rotate them in the field, but it can be done.

Callum did a follow-up to the video and talked about phasing the elements to provide a bit better gain and easy rotation. To phase this antenna, it requires two of the elements to be fed in phase and one element to be delayed. In short, you add a piece of 75ohm coax at a specific length which delays the signal to one of the elements of the antenna and helps direct the RF in one direction. Phasing the antenna improved the theoretical and modeled gain to 5.92dBi. A .3dBi improvement over the parasitic array. (See figure 3 for the modeling of the Phased Triangular Array)

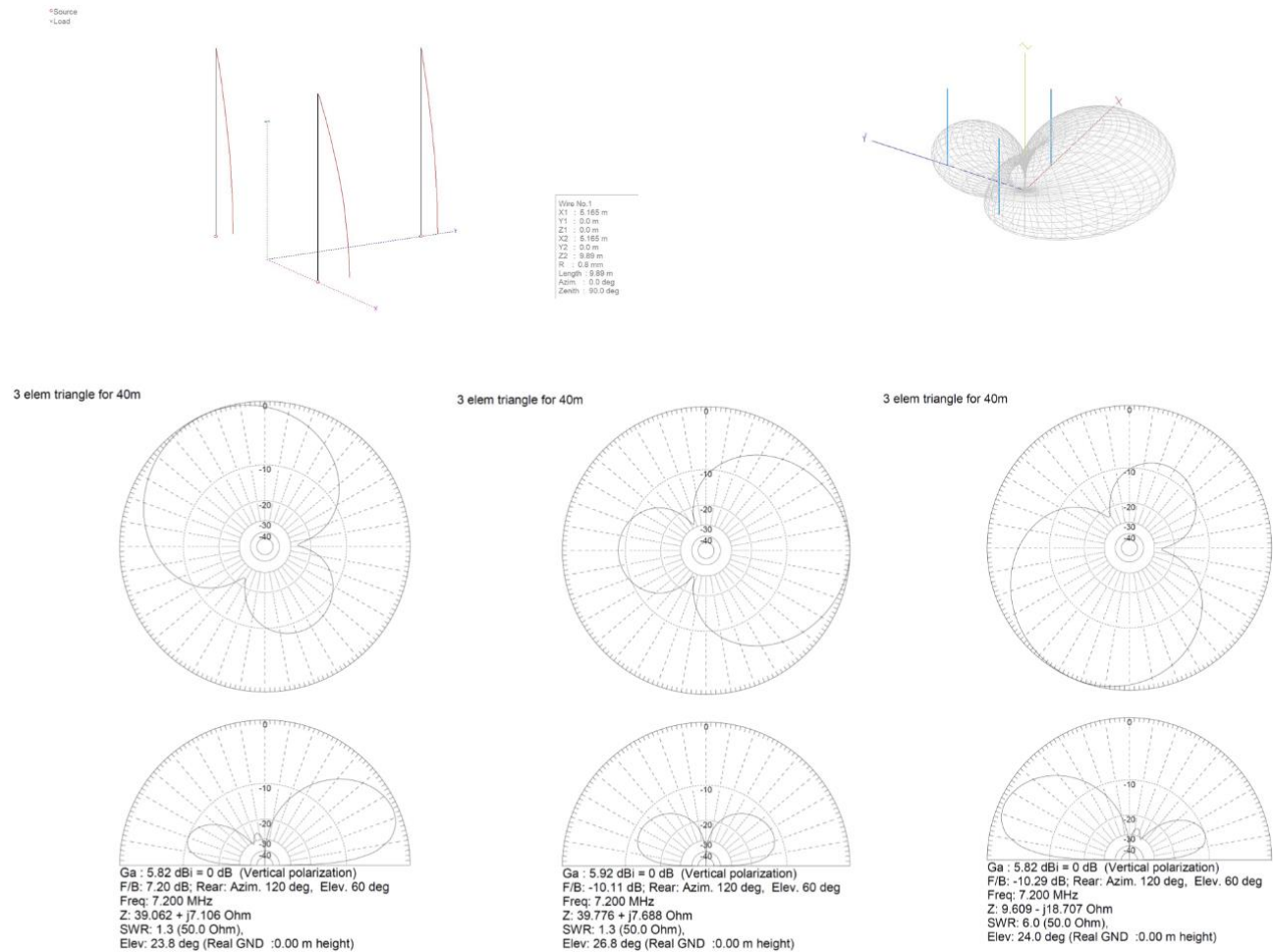


Figure 3 Triangular Phased Array Performance

In order to make it as simple as possible to rotate the antennas you could use relays to insert the phasing delay line into the feed points. For the YCARS Field Day 2021, I decided to build a phasing relay box in order to allow the club to rotate this antenna with having significant off-air time to manually switch the antenna.

I had a couple of requirements for the box. Most importantly it had to be able to work on multiple bands, and secondly it had to handle 100watts of power.

The design is a simple, three two pole relays used to switch in a 71deg phasing harness made from 75ohm RG11 cable. See Figure 4 for the basic design of the phasing network. The construction of the switching network is quite simple

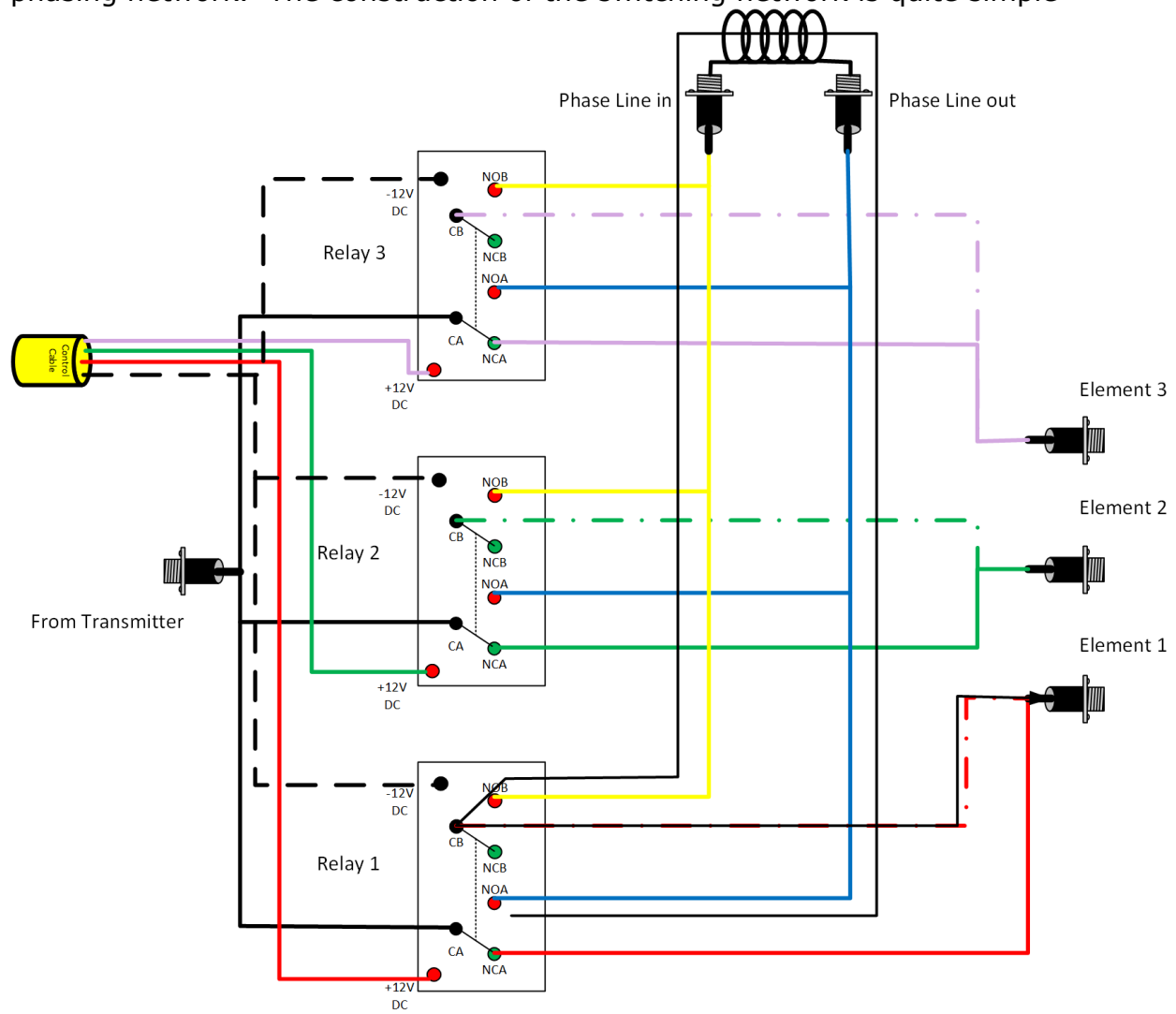


Figure 4 Phasing Network Schematic

for a 100watt radio input, I used 250v, 30A double pole relays, but switching can also be achieved using 6 single pole relays of the same rating. I used 18awg silicone wire to make connections between all the components of the network.

I connected all the SO-239 connector bodies together and to a ground lug so it may be connected to the radial fields or a ground rod. See Figure 5 for the relay network construction diagram. The housing is a 10.7"x7.4"x3.5" poly-carbonite box that is IP67 rated for water intrusion protection. I used a 1/16" thick aluminum

plate to cut the mounting plate for the relays and terminal strips. A four-pin aircraft style connector can be used to connect the control wire to the relays.

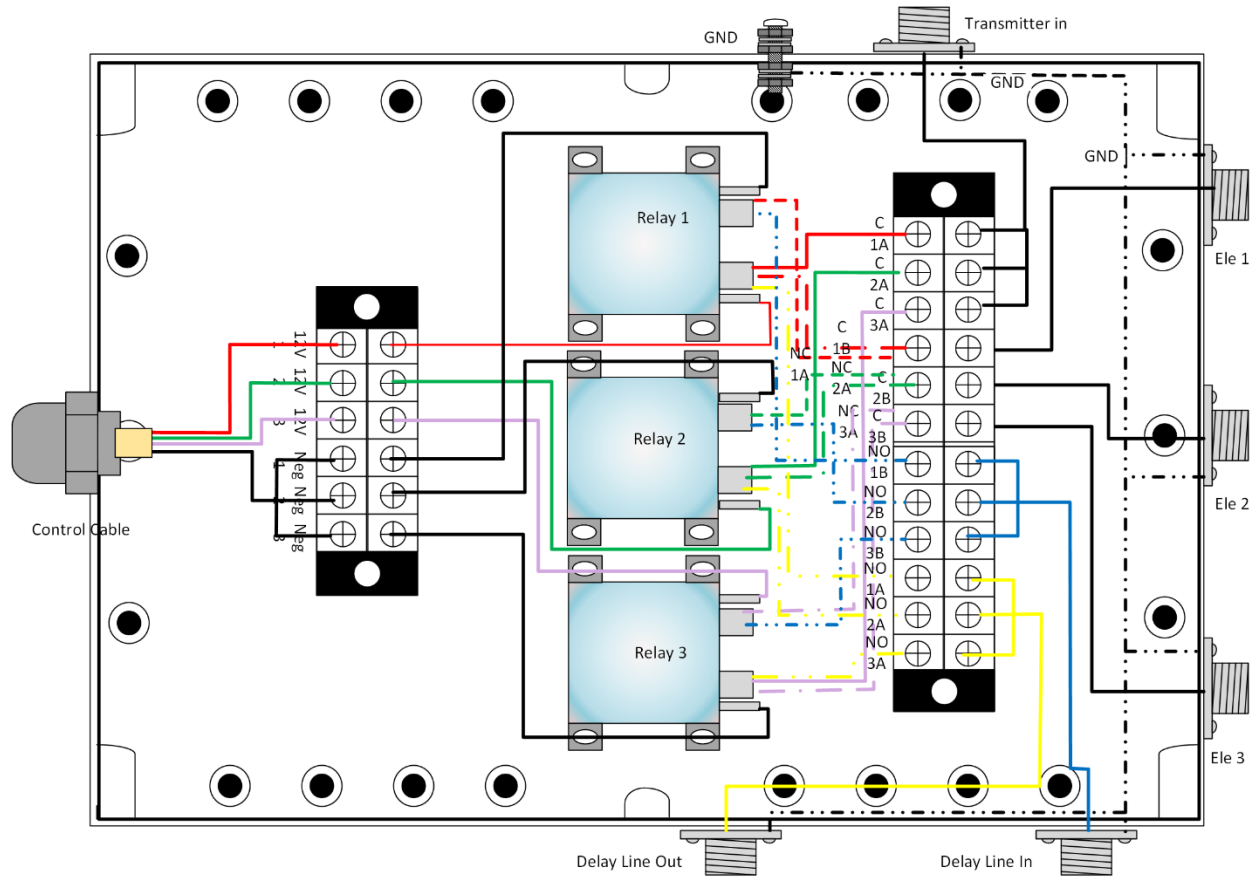
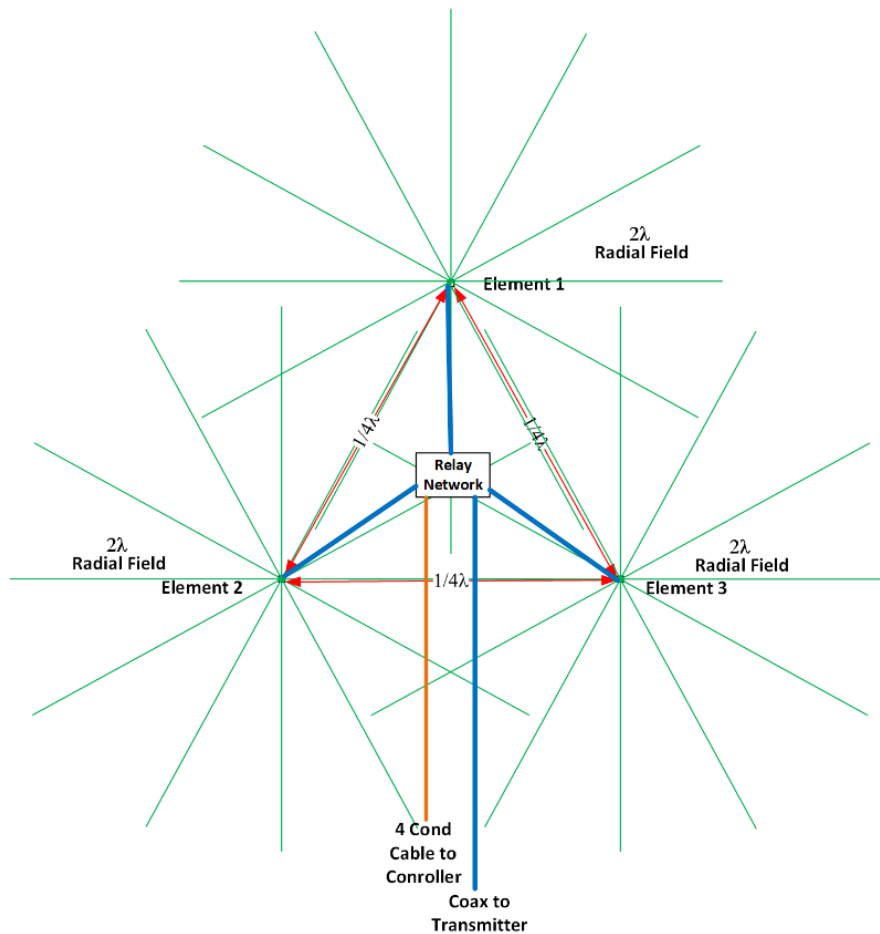


Figure 5 Phasing Network Construction Diagram

To use the antenna as a phased array, the configuration of the antennas changes as all three vertical elements are fed with equal lengths of 50ohm coax. See Figure 6 for the configuration of the antenna. The phasing relay network is placed at the center of the antenna. Each of the three vertical elements are fed with equal lengths of 50ohm coax at quarter-wavelength ($1/4\lambda$) from the phasing network. A four-conductor cable is run from the controller at the operating position to the phasing network. This cable carries the 12v DC power to switch the relays.



The construction of the controller for the Phasing Relay Network is a very simple circuit using a rotary switch, individual toggle switch or even a micro controller like an Arduino and relay board. I designed my controller to operate with a four-position rotary switch. See figure 7 and 8 for the circuit design and build diagram for the controller.

Figure 6 Triangular Phased Array Layout

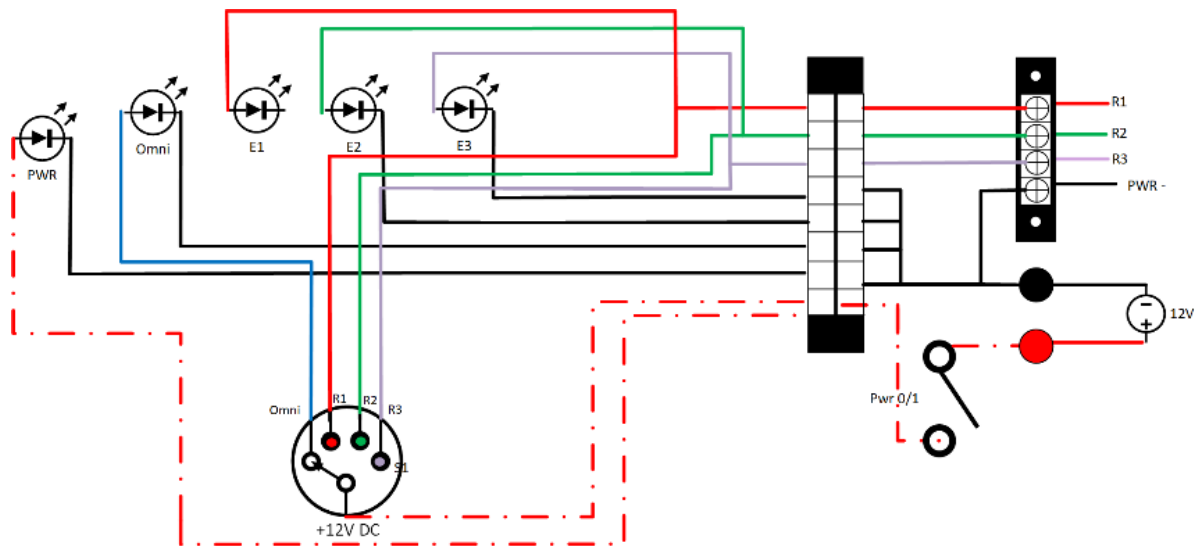


Figure 7 Array Controller Circuit Design

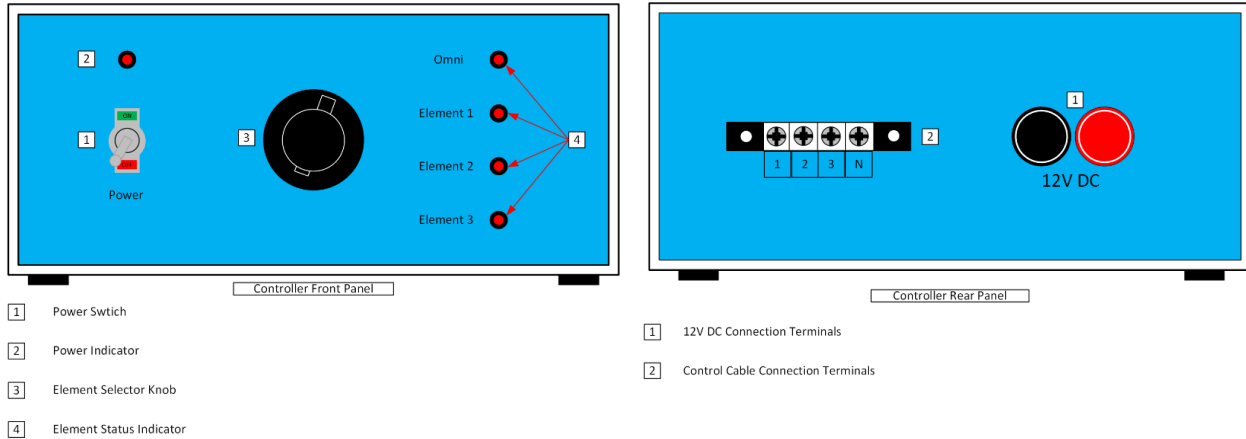


Figure 8 Phasing Network Controller

With the controller and relay network in place the antenna RF output can be rotated by the operator at the station. The rotation of the antenna array’s RF output results in a radiation pattern that has three 100deg wide lobes, with maximum gain points at 120deg from each other. See Figure 9 for the detail of the radiation pattern for the three elements combined.

The antenna is a solid performer with great practical use in the field for Field Day, emergency communications, long POTA activations and Dxpeditons

There are a host of antenna arrays that can be constructed and use this particular controller and switching network to provide gain on any band. The box being constructed with phasing line in and out connections allow for use on any band with the proper phasing line and vertical array. I have modeled a standard 2 element vertical array, 3-element vertical inline array, 4-element $5/8\lambda \times 1/4\lambda$ array that provides amazing gain and has an excellent radiation pattern. More to follow with the other possibilities. Below is a parts list for the build and some pictures of the finished product.

So, until next time – “73 and Stay Passionate about Ham Radio” – NJ4Z

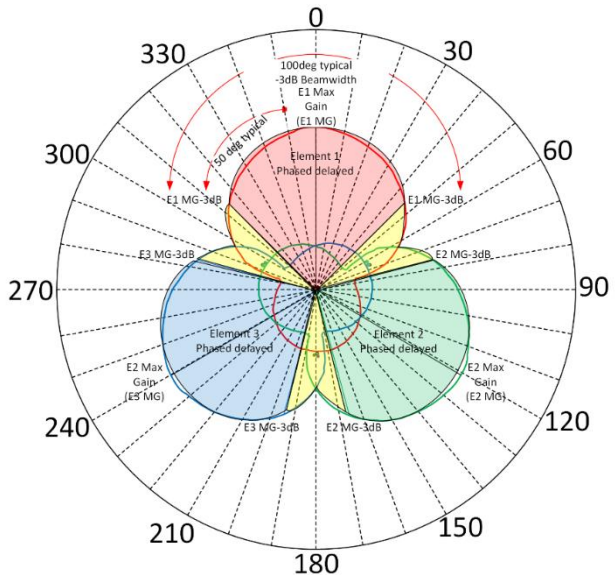
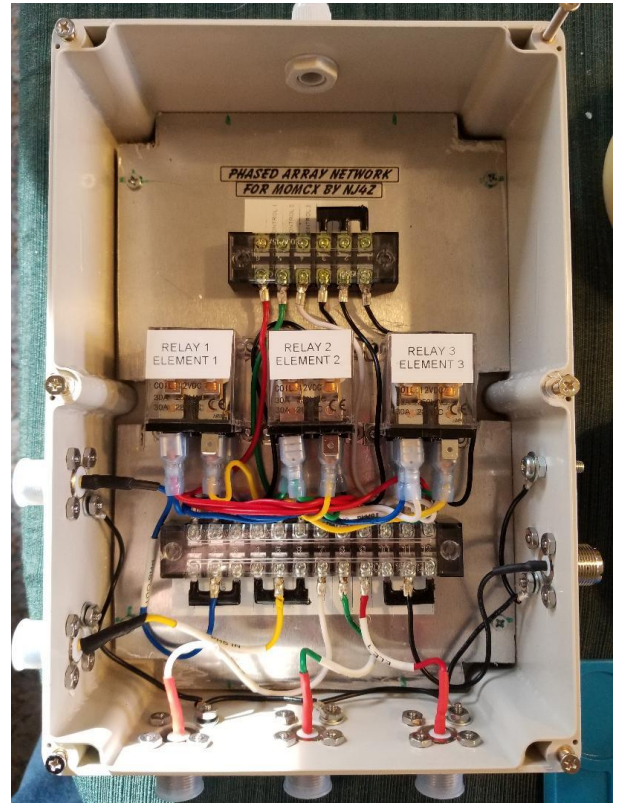


Figure 7 Phased Triangular Array Antenna Rotation Pattern

Relay Network Parts List	
Qty	Description
1	Poly-carbonite enclosure 10.7"x7.4"x3.5"
1	12"x8"x1/16" Aluminum Plate
3	250v 30A Double Pole Relay
6	Panel Mount SO-239 Connectors
1	6 position double row terminal strip
1	12 position double row terminal strip
21	.250 insulated quick disconnect terminals
38	.250 fork connectors (solder-on)
7	#6 Rung terminals (solder-on)
1	1/2" cable gland
1	Assorted length #6 machine screws, bolts washers and nuts
1	assorted color 18awg silicon wire

Controller Parts List	
Qty	Description
1	6.5" X 4.5" X 4" metal project box
1	4 position rotary switch
1	8 position double row terminal strip
1	panel mount 4 position single row terminal strip
1	set panel mount battery terminals
1	single pole, single throw 10amp toggle switch
5	3mm red LEDs
5	3mm panel mount holders
18	.250 fork connectors (solder-on)



THE YCARS BONEYARD

A place to sell, trade or find Ham related Equipment

WB4JR – Jimmie Rogers – less than a year old 1KW amp - Ameritron AI-80B HF linear Amplifier - for \$1,450.00 and a Diawa CN-901 SWR meter \$75.00 – Please call 803-517-4003

This column will be a forum to ask questions and seek knowledge of amateur radio... we are looking for someone to help answer these questions for members, if you would like to volunteer to help answer or have a question, please email NJ4Z@ycars.com –

KM4KGH – “the Bear” is offering a Wouxun KG-UV899 Dual Band HT for \$60.00, Radioddity GD-77 DMR Dual Band Hand Held for \$60.00 and TYT- TH-9800 Quad Band 70cm/2m/6m/10m FM mobile for \$185.00 Call 803-372-8487

K4Ytz – the club has several items for sale – please see [YCARS Boneyard – Page 1 – K4Ytz – YCARS](#) for details.

YCARS News and Updates

Be YCARS Aware

YCARS Christmas Party – December 9th, 2021 19:30h

The YCARS Christmas party will be held December 9th at the Catawba Baptist Church in Rock Hill, 1450 S Anderson Rd. The move to an offsite facility was due to the incredible growth in our club, we cannot expect to accommodate members and guests at our club house. We need all the RSVP's by Dec. 6th. We are asking each family to bring a covered dish or dessert to share and serving utensils for your dish. We are also asking each person attending to bring two non-perishable food items to be donated to the Catawba Baptist Church's Emergency Food Program. We will continue the traditional White Elephant Gift Exchange Game. Each person attending, that wishes to participate is asked to bring a wrapped gift of \$10.00 up to \$20.00 in value for the game. It is exciting and always fun.



YCARS SKYWARN Recognition Day:

YCARS will be hosting Skywarn Recognition Day 2021 at our facility. 12/04/2021 from 1300 to 1800 local. This will be a Chili Cookoff and radio contesting event. Enjoy some YCARS hospitality and fellowship.

YCARS Community Support: Rock Hill Christmas Parade:

We are asking for HAM radio volunteers to help support the Rock Hill Christmas Parade on Dec 3, 2021 from 5pm to 9pm. If you want to have some fun and celebrate the start of the Christmas season, Come out and help us provide a Safe and Memorable time for our community. We will provide more Details and have couple of Pre Event meetings for those that sign up. To be in the loop for those meetings, please take time to Sign Up and show your support.

[YCARS: YCARS Rock Hill Christmas Parade Support \(signupgenius.com\)](https://signupgenius.com)

The York County Amateur Radio Society

www.YCARS.org

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