

# 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

### Contents

- Pg.2 – Welcome, Contest Calendar
- Pg.3 – From NJ4Z’s Hamshack
- Pg.4 – Getting on the Air
- Pg.10 – Octogenarian Observations
- Pg.11 – YCARS in Action
- Pg.12 – New Hams and Upgrades
- Pg.13 – Ask an Elmer
- Pg.14 – The Workbench
- Pg.16 – YCARS Boneyard KA4WYC’s Chicken Coup
- Pg.18 – YCARS Club News and Updates
- Pg.21 YCARS Wall of Arrogance

### June 2021 Club Activities

- Thursday, June 4<sup>th</sup> - Radio Room Operating Night 18:00-20:00
- Thursday, June 10 – Business Meeting – Clubhouse/Teams 19:30
- Friday, June 11 – Monthly Simplex Net – 21:00
- Saturday, June 19<sup>th</sup> – 09:30 VE Testing
- Saturday, June 19<sup>th</sup> - 11:00 Elmering Event Clubhouse
- Thursday June 24<sup>th</sup> – 19:30 Presentation Night
- Fri-Sun, June 25-27 – YCARS Field Day – Westminster Park

### 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

# Welcome to the YCARS TRANSMITTER

Vol.1 No.5 May 2021

Hello everyone,

Welcome to the latest edition of the York County Amateur Radio Society's Newsletter – The YCARS TRANSMITTER.

Wow! was May a busy YCARS month or what? June? well the trend continues. After nearly 14 months of social distancing, we are getting back to radio fun as a club!

NJ4Z's From the Hamshack – Our Editor reflects on the Rebirth of YCARS, the busy month of May, and the beginning of Solar Cycle 25.

“Getting on the Air” is all about setting up your Ham Radio project workbench, and while we are talking about “The Workbench” Dr. Marc Tarplee, N4UFP, ARRL SC Section Manger gives us the blueprints and instructions for building one the best wire antennas, the ZS6BKW.

Our resident Octogenarian Joe, W8DKR gives us the downlow on Hex... hexadecimal that is...

Our YCARS in Action features Hillary, AB1CD's recap of the Hard Work and Great Fun had by the YCARS Family participating in the YCARS Club Participation Day

Our Ask an Elmer question this month comes from Scott, KG9V regarding “Tiger Tails” to improve HT performance.

Jeff Blythe, KA4WYC shares his experience with CWOPS and relearning “The Code” – KA4WYC's Wild Yella' Chicken Coup.

Also, this month, in YCARS AWARE, we welcome 4 new members to the YCARS family, bringing our YTD new members to 28. We update the 2021 Summer Field Day plans, recap the Det. Mike Doty Memorial run, and share information on other upcoming club activities.

We hope you enjoy this month's YCARS TRANSMITTER. We need your support and feedback to continue delivering quality content. Please send feedback, submissions or questions to John, NJ4Z – Email: [NJ4Z@YCARS.org](mailto:NJ4Z@YCARS.org)

All the best and 73.

## JUNE 2021 Contest Calendar

6/12 – ARRL VHF 18:00  
UTC – CW, SSB, Dig,  
RTTY

6/19 – Stew Perry TBC  
– 15:00 UTC – CW

6/26-27 ARRL Summer  
Field Day 18:00 UTC

KY and WV QSO - TBD



# From NJ4Z's Hamshack

## Musings from the Editor

May was an extremely busy month for YCARS, we accomplished quite a bit. I was nice to see 30+ members attend the club participation day on May 8<sup>th</sup> and the 20 or so members that participated in the communications support for the Mike Doty Memorial 5K on May 15<sup>th</sup> in Fort Mill. Thinking about all that was accomplished this month through the dedication, teamwork and passion this club has is amazing. I could not be prouder of YCARS or to be a member of such a great organization. The rebirth of YCARS over the past four years is mind-blowing. Our club is seeing unprecedented growth at a time when other clubs are struggling and waning. We have added 28 members in the first five months of 2021. It is because of our leadership team and membership's passion for Amateur Radio and the love of our YCARS family. We, as a club, have become so much more than just the sum of our membership. We are the embodied spirit of Amateur Radio. Art, Science, Technology, Education, Service, Community, Legacy and Adventure, every aspect of amateur radio was seen from our club this month. The Art of communications with our newsletter and superb May presentation by Tim Duffy, K3LR. The Science of building the new antennas for the towers. The new Technology that was installed at the clubhouse for remote operations and access. The Educational opportunity during the license testing and mentoring session. The Service provided to the community during the Det. Mike Doty Memorial 5K benefiting Keystone. The Community of our club participation day, and our fist Women at YCARS event. The Legacy we are building with all of the effort to improve our club and grow Amateur Radio. The Adventure of our club being so very active in Parks on the Air, with many of our members doing multiple POTA activations.

As we look to June and beyond for 2021, our level of activity is increasing as the pandemic wanes. Field Day 2021 will take place this month as well as our first weekly Wednesday mentoring night, the June operating night, the installation of the new antennas, another testing session and mentoring class. We have the Club Picnic, Foxhunt and POTA activation in July. We also are progressing with our plans for the 69<sup>th</sup> annual Rock Hill Hamfest. It has been an amazing month and so excited to see what the future holds for us.

Changing the subject, a bit, Solar cycle 25 is beginning to take shape and the Sun is beginning to wake up from her 3-year slumber. We have seen increased SFI and sunspot numbers providing better propagation on the higher frequency bands. As summer begins the E-skip is in; 6 and 10 meters really have come to life over the past few weeks. As Cycle 25 progresses we should see much improved propagation, combined with the return of DXpeditions as travel restrictions due to the pandemic are lifted, we should be in for a great three to five years of radio fun. Those of us who have been licensed within the last 5 years have experienced the deepest solar minimum in the past century. We should be in for a real treat, experiencing Amateur Radio during a Solar Maximum. The time is now to prepare and install those antennas for the higher bands to increase your enjoyment of this Passion we all share.

So, until next month, stay passionate about Amateur Radio... 73 - NJ4Z out

John Gendron, NJ4Z - Editor, YCARS Transmitter

# “Getting on the Air”

## Helping New Hams Advance

### You’ve Earned Your Ticket, Now What?!

## The Workbench!!!

**By: John Gendron, NJ4Z**

A licensed Amateur Radio Operator can choose to buy, install and operate equipment that all manufactured. There are enough companies and amateurs building equipment to sell, and for amateurs to consume and operate so that an entire station can be purchased and installed with limited effort. For me being an Amateur involves experimentation and discovery. Gone are the glory days of kit building, when companies like Heathkit sold amateur radio kits, that could be built into beautiful and efficient transmitters, receivers, tuners, amplifiers, etc. Although, today we still have companies like Elecraft, McHF, Pixie Kits, etc. that supply kits for amateurs to build, so kit building is not completely dead. I enjoy designing and building my own antennas and other gear. There is something special about building, hanging and making a contact on an antenna that you built. The sense of accomplishment and pride that comes with a successful build and the lessons learned from a failed attempt make an operator better over time. We, as licensed operators, spend hours studying the basics of electromagnetic physics, electronics, electrical circuit theory so we better understand the power and scientific laws we are using to complete our wireless communications. Would it not be wise to put those lessons to work and build or repair our own equipment? With the basic understanding of electronics and circuits you may find yourself saving money by repairing, instead of replacing household items, toys and games.

### “The Space”

Whether you are going to build a kit, homebrew equipment or make repairs you will need tools and space to construct your projects. As with your shack or work area you need enough room to work comfortably. You will need power outlets with enough capacity to run your equipment. A dedicated or pair of dedicated 20-amp circuits for the workbench would be ideal, but not always practical.

Adequate lighting is very important and a good internet connection wireless or wired is a good idea as it will aid in looking up diagrams and instructional videos for you project. I currently have my work/test bench in my shack. It is ideal for making quick repairs, small builds or prototyping. For larger projects I use my garage workshop.

## “The Workbench”

Your workbench can be a simple folding table or can be an elaborate worksurface with drawers, pegboard and much more. The important things to consider are the size of the surface and the height at which the surface is located. The length and width of the work surface must be large enough to hold your projects, give you room to work and hold the tools you are using. The height of the workbench depends on whether you will use the bench while seated or while standing. 29-31” would be standard table top height for a seated position and 39-42” would be standard height for a standing bench. I noticed while walking through Home Depot a few weeks ago an adjustable height worksurface that hand cranks from 29” up to 42”. It came in various lengths from 46” to 72” and all had a depth of 24”. I must admit one of these in the near future may replace my current shack workbench. One other super feature of the that workbench was two very spacious storage drawers under the work surface. Which brings up the next item to consider while planning or updating your workbench.



*Husky Adjustable Workbench*

## “Storage”



When considering space for your workbench, you must consider all the tools and parts that will be inhabiting this space. Hand tools, power tools, test equipment, power sources, parts, etc. they all must find a home on or near your bench. A small tool box or drawers on the workbench would be ideal. A small parts storage unit, with multiple bins or drawers will help immensely. Harbor Freight or Northern Tool are great sources to find inexpensive tool and parts storage boxes.

## “Power”

Earlier we mention having enough power to run your test equipment, DC power supplies, power tools, computer and chargers. Two 20-amp circuits one at 120v and one at 240V would be ideal for the workbench, but it is not always practical, a single 15amp 120v outlet will work you just may have to work in such a way as to not overload the circuit. It is very useful to mount a multi-outlet power strip to the workbench. The location of the power strip is not overly important, it just needs to be accessible and out of the way while you are working. Also consider much equipment these days have wall wart transformers, so wide spacing between outlets on the power strip is a real benefit.

Since we are on the subject of power, let’s talk about power sources for your projects or repairs. A variable regulated DC power supply with adjustable voltage and current is a must. Also, a very nice luxury to have on the workbench is a variac, which as a variable AC transformer. It allows for the AC output voltage supplied to a piece of equipment to be slowly increased or decreased. This a very important aid in testing or trouble shooting older equipment. I also keep a 12V battery on the bench to use for a quick power up on some of the equipment.

### “Lighting”

When working on small parts, circuit boards etc., good lighting is a necessity. A direct light source over the bench is a must. Some smaller adjustable lights would be a real plus, and allow for you to get the light when you need it. I also would recommend, a magnifier with a light source that can be moved over the desk. A set of magnifying glasses with lights will do wonders as well. For really detailed work a small inexpensive digital microscope and a digital borescope will help immensely.

Additional necessities on the work bench, would be a neoprene or nonslip mat to keep parts and projects in place while working on them. A good silicone soldering mat with anti-static properties and antistatic strap will help you from not only damaging the worksurface but also the sensitive components. A wooden block also helps if you are doing any drilling and or coaxing a part with a hammer.

### “Helping Hands”

Keeping parts in place with a neoprene or silicone mat will work for most situations but, when soldering we sometimes need three or four hands to hold all the connections together. The tool in one hand, solder in the second and then a part plus two or more wires. Yep, you have run out of hands, unless you have very dexterous feet or nimble fingers you are going to need additional assistance. For soldering a helping hands vice with a magnifier is essential. These little adjustable gems with the alligator clips for hands can hold you work or wires and allow you to work efficiently. They come in different sizes, but sometimes you need something just a bit bigger. A small bench top vise will come in handy if you are working on large coax or bending a piece of metal. They are relatively inexpensive and come in a variety of mounting styles from suction cup, clamping to bolt down. There are also a variety of accessories for the jaws of the vise which can with bending and fitting tasks. When working on circuit boards a circuit board vise is ideal. Sure, you can place the board on the silicon mat and solder away but it much easier to access to both sides of the board and having it elevated off the work surface.

Another great addition to your workbench helping hands tool kit, is the cake pan. CAKE PAN????!!! A 9”x13” cake pan inverted, with 10- and 12-gauge solid wire of various lengths attached via nut and bolt, and alligator clips on the opposite ends. The wire is solid it has enough rigidity to hold its shape when bent. A friend, fellow club member and “Living Legend” WB4QNI, Steve Kelly gave me one of these. I am not sure whether he designed it or built it from a design he had run across. It is absolutely perfect for soldering larger items.



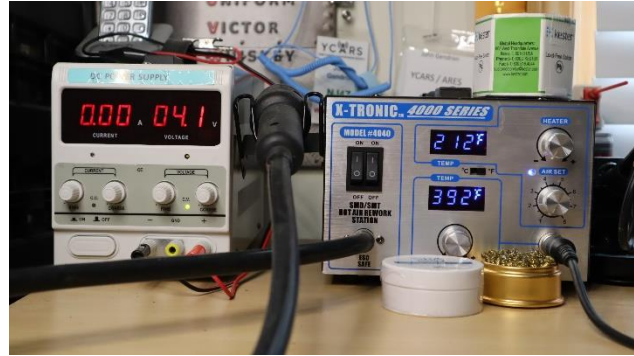
*“Cake Pan Hands, PCB Vice, Benchtop vice and Helping Hands*

A magnetic parts pan is a perfect for keeping all those tiny screws, bolts nuts, and parts from running all over the workbench and on to the floor.



## “Soldering Station”

We have mentioned soldering quite a bit in this article and not once have we talked about the equipment to perform the work. There is nothing like the smell of the solder and sight of the smoke wafting away from the work. I love my time on the bench especially when soldering. There are so many choices in tools for the work at so many price points there is no reason not to have at least a basic set up.



*Variable DC Power supply and X-Tronic Soldering Station*

There are the all-in-one stations that give you an adjustable temperature iron with multiple style of tips. As we all know there is not just one tip for a soldering iron or gun that will do it all. These all-in-ones also will have an adjustable temperature hot air gun with multiple tips to do rework or solder surface mount devices (SMD) on to a PCB. The bonus with an all-in-one station having that hot air gun allows you the flexibility to heat shrink tubing and thin metal and plastic parts to bend easily. I rarely use my air gun for SMD work. Weller, Hakko and X-tronic are the brands I would recommend to anyone for a solder station or individual tool.

Again, there are so many choices here with soldering tools, that we could talk about choices all day long. If you are going to use you soldering tools away from the bench then a small iron and a larger wattage soldering gun are in order. You can still use both on the bench and have them portable enough for field work. Invest in the best tools you can afford and buy as needed. Another item to consider is a small butane pencil torch, sometimes they are the right tool for the job.

When soldering big pieces of metal or connectors, you can overheat the parts because there is so much mass. A high temp tip with big surface area is required for this work. Keep that in mind when purchasing your soldering tips, it will save you from ruining connectors.

There are a few indispensable tools when building out the soldering station on your bench, we all make mistakes, so make sure to get a de-soldering tool or some solder wicking material to use with your rework hot air gun. Do not forget to get soft coiled tip cleaners and holder. A good pair of diagonal wire cutters a.k.a. dykes, tweezers, and medical locking forceps are a must for the soldering station

Do not forget to add heat shrink for your supplies, if the work is going to outdoors or in a wet environment, make sure to used glue lined heat shrink. The glue will really help keep the moisture out.

## “Test Equipment”

The most important piece of test equipment for your work bench is a digital multimeter. As with most tools you can buy an inexpensive unit or break the bank with some of them. As with most things you will get what you pay for with a multimeter. If you are inexperienced in using one, I would suggest looking at one particular unit that has some nice features as is not going to eat up your budget. It is the Kaiweets TRMS 6000 it has many nice features and is not expensive. The unit will light LED rings around the ports for the probes when switched to a function. This function helps eliminate damaging the unit. An analog multimeter can be very useful in measuring rapidly changing values of current and voltage. I



*Rig Expert AA600, DROK Component Tester, Kaiweerts Multimeter, Dymo Labeler, Mini-borescope and Microscope*

inductors, capacitors, resistors, and the layouts for transistors, and will also identify components.

For more advanced bench operations an oscilloscope and a signal generator would be wonderful additions.

Although not technically a workbench item, if you are going to build antennas, an antenna analyzer is a must, even for manufactured antennas. The cost for these units can be a barrier, but save up for one. I would recommend the “RigExpert” brand. I have owned a couple of different units by different manufacturers. The intuitiveness of the “RigExpert” and the quality of the display, make it the best value in my opinion. A Vector Network Analyzer (VNA) is also an option for checking antennas. There are several lower cost options like the Nano-VNA. They will definitely give you more information on your antenna set-up versus a standard analyzer, but there is a bit of a learning curve.

#### “Hand / Power Tools”

There are a few must haves when you first set-up your bench. Most of these tools a home owner or someone who is a do-it-yourself type will already own. These tools will get you started and through most projects.

1. Precision Screwdriver set – magnetic is preferable with Philips, flathead, Torx, pentalobe, square, star and hex bits.
2. Basic wire strippers – 10AWG – 24AWG – most of these units will be multi-tools and have wire cutters, terminal crimps, and screw cutting blades.
3. Needle-nose pliers – most everyone has several pairs of these tools in varying sizes.
4. Standard screwdriver set #0,1,2,3 Philips, 3/32, 3/16, 1/8 and 1/4” slotted widths in varying lengths.
5. Lineman pliers – most folks will have a pair of 7” or 9” linemen’s pliers, with wire cutters and wide flat pleyer surface.
6. Diagonal Cutters – “dykes” – specialized wire cutters that are able to leave a flat finished cut.
7. Exacto or Razor knife useful for stripping wire and cutting wire insulation among other things.
8. Coax Connector crimp tool - for RG-58, RG-213, RG 8X- RG-8U (LMR-400).

would recommend having both. Harbor Freight will have the analog meters as a freebie or \$ 2.99 special once in a while. If they are free pick them up every chance you get, never hurts to have a couple of these. Clamp-on style multimeters make measuring current much easier than using probes, but they do cost a bit more. If you will be building kits, prototyping, or doing repairs, another very useful tool for your bench is a component tester. These units will give you the values of





*Precision Dykes, Extraction Tools, Tweezers, Forceps, Splicing Scissors, Terminal Crimper,*

As you build out your bench and expand your projects. You can acquire more specialized tools. I will start with a most useful tool, a set of ratcheting crimpers. These will not only save time, money, but your hands as well. The ratcheting action helps reduce the pressure needed to make the connections. You can interchange the crimp dies in these tools. You can find these tools on Amazon or from shops like DX Engineering. They will vary in price and quality. I am partial to Klein Tools for these but, Greenlee and DX Engineering have fine tools as well. I have a

couple sets of these, because they get some much use, it does not make sense to change out the dies all the time. I keep one of the tools with a set of insulated terminal dies in it, one with a set of Anderson Power pole crimp dies and one with a set of coax crimper dies for RG-8U and RG 213. You can start with one and buy the die sets, it is much less expensive than several specialty tools. I would also recommend a set of dies for RJ-45, and RJ-11 4c/6c modular plugs to do repairs on mic and other connecting cables.

While basic wire strippers are fine, there are some very good wire strippers that make life much easier. A good set of self-adjusting wire strippers will save you quite a bit of time and fatigue on your hands.

Saving time and reducing repetitive motion is important when working on projects, so a battery driven or ratcheting screwdriver is a very nice addition to the work bench. I have a very inexpensive tack-life set that works fine and recharges via USB cable. While we are talking about battery operated tools, I have found that a high RPM rotary tool with various bits and tips is a life saver. These little tools can do precision drilling, shaping, sanding and cleaning, as well as cutting. Dremel is the name brand, but many other companies have alternative products. I have a rechargeable unit from Tack-life.



*Precision Screwdriver sets, Rotary Tool, Battery Screwdriver, Ratcheting Crimp Tools and Dies*



*Wire Strippers, Nut Drivers, Self-Adjusting Wire Strippers, Wrenches, Bent Nose Pliers*

Other important hand tools to consider, a mechanical labeler. There are many choices here, it is very nice to label all your wires, cables, switches etc. I use two brands DYMO and Brother. The label material can be vinyl, laminated, polypropylene and even heat shrink and materials come in a range of colors of background and text.

As you build out your bench and acquire more tools, here is a list of tools that I keep in my tool box.

1. Spring hook set
2. Set of dental picks
3. Set of needle files

4. Set of precision plyers
5. Set of plastic spudgers
6. Set of precision tweezers
7. Set of roll pin punches
8. Set of hex key wrenches
9. Set of terminal insert/extraction tools
10. Center punch
11. Splicer (Tech) scissors
12. Miller strippers
13. Plastic or metal ruler
14. Tape measure
15. Flexible shaft for precision screwdriver set

Now let us set-up our workbenches and get to building. We have so many wonderful projects out there to build. If you have questions, please reach out to me or one of the other folks in the club, we are here to help get you on the air.

If you would like to share your hamshack or write an article describing your shack design considerations we would love to publish it in the YCARS Transmitter, please submit to [NJ4Z@YCARS.org](mailto:NJ4Z@YCARS.org)

## Octogenarian Observations with Joe W8DKR

Hexadecimal numbers are just a short hand way of representing binary numbers. Group of 4 binary bits are equal to one hexadecimal number. Starting at 0000 and going to 1111. Remember in computers zero is a number and also place in memory. So 0000 = 0 in hexadecimal and 1111 = F. Notice that hexadecimal numbers are 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F. The letters A,B,C,D,E,F are numbers and are always upper case. Hence, you have one number representing four binary bits. The MAC address in Network interface devices is in hexadecimal and is a unique number for example 00-14-22-04-25-37, The first three groups of number indicate the name of the manufacture and the last three groups the network device. Hence a manufacture could have  $(16*16*16 = 4,096)$  different Network devices. However the plot thickens (one of my favorite saying). The MAC address has expanded in number of bits. Look at all your computer network devices and see if you can find the MAC address. Why do network devices need a MAC address?

See [https://en.wikipedia.org/wiki/MAC\\_address](https://en.wikipedia.org/wiki/MAC_address).

# YCARS IN ACTION

YORK COUNTY AMATEUR RADIO SOCIETY

## “Hard Work and Great Fun”... Club Participation Day

Hillary Ramsey, AB1CD

YCARS held its first Club Participation Day of 2021 on May 8<sup>th</sup>. There were about 30 members working and two guests visiting the clubhouse during the event.



*Brian KO4PQT, Walt KF4QXQ, Bill KO4NZA work the hill*

It was a busy and rewarding day with many of the set goals being accomplished. Several of the club members arrived with brush cutters, string trimmers, rakes and the like and proceeded to attack the brush, weeds and overgrowth on the road facing hillside. After 90 minutes of work the hillside crew managed to remove the overgrowth and a small tree at the entrance that obstructed the view of

traffic, dramatically improving the appearance of the clubhouse from the road.

A second crew using brute force and a power hammer drove ten 8ft ground rods to improve the grounding system for the clubhouse. Several members dug holes and trenches to provide space for the ground wire and access boxes over the ground rods. The #4 bare copper ground cable was installed in the trench and connected to the ground rods.



*Club Members prepare to drive another ground rod*

A third group gave the clubhouse and hamshack a thorough cleaning, hung pictures and plaques on the wall.





Wayne KD4RDP and Tim K6FNV install the grounding enclosure

A pizza lunch and drinks were provided by the club and was enhanced by the company of our fellow club members. After the lunch break, the new hamshack and antenna grounding enclosure built by Andre, W3PAL was installed at the rear of the clubhouse, while other members cleared debris from the base of the East tower.

Two other groups of members began to build the new 6-meter and 5-band A3S-30/40 Yagi antennas.

Member sentiment was positive and many were planning to participate in the next Club Participation Day to be held July, 10<sup>th</sup> 2021.



Bill K4CIJ, Harry KZ1H and Larry W4LJS completing the 6M YAGI

## New Hams and Upgrades

Congratulations to all those who successfully passed examinations during our test session on May 22, 2021

### Welcome to Amateur Radio

- Robert Lowder – KO4QQV
- Wes Woddin – KO4QQW
- David Biggers – KO4QXB

### Congratulations on the Upgrade

- KO4PQU/AG - Steve Hackett
- KO4ORD/AG – Joy Taylor
- K4CIJ/AE – William Ross

# "Ask an Elmer"

## Ham Radio Advice and Answers

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*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](mailto:NJ4Z@ycars.com) –*

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Our Question this month comes from Club Member Scott Putnum, KG9V

Scott Asks; "Here is one that is puzzling me. I'm trying to improve TX/RX with my handhelds. I've changed to a longer whip with some improvements. I've read that perhaps adding a counterpoise (tiger tail) can improve things, but others say that body is sufficient enough as the ground and it doesn't make a difference. Does anyone have some real-world experience in this dilemma?"

The antennas on all HT's are verticals, the small "rubber duck" antennas are coils of wire helically wrapped up a central member. They work but are quite inefficient. They rely on the capacitance of your body to act as counterpoise for the antenna. It is a poor match at best. Improving your RX and TX on a handheld over the "rubber duck" antenna is quite easy. Changing to a true quarter wave or 5/8 wave antenna will provide better performance. Dimond, Comet and Nygoya provide very good long whip antennas. Further gains can be made by better matching the counterpoise to the antenna. By adding a 19" piece of wire to the ground side of the antenna on a dual band (2M/70cm) radio, effectively makes the antenna a vertical dipole. This "tiger tail" as the wire is sometimes called provides a better matched counterpoise to the antenna system. Efficiency will improve allowing the antenna to radiate better. The addition of the "tiger tail" can be done using a ring terminal over the antenna connector on the "HT" or by attaching to a body screw on the "HT" case. Just be sure that the body screw has continuity with the antenna ground side. If you are using a mono band 1.25M (222Mhz) use an 11" counterpoise wire or for a monoband 70cm 6.5" wire will work best.

More information can be found using the following YouTube Link: <https://youtu.be/szmQmCn1tH4>

All the best until next month...

John Gendron, NJ4Z



# THE WORKBENCH

## Ham Radio Projects, Tricks and Tips

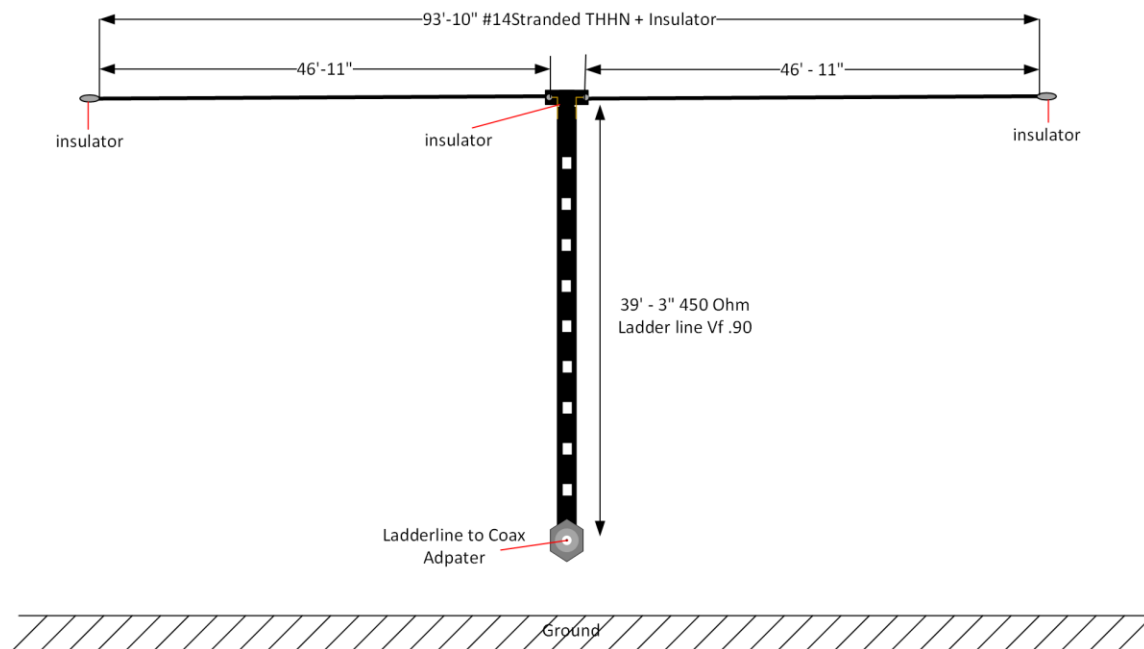


Dr. Marc Tarplee, N4UFP  
ARRL SC Section Manager

One of the questions amateurs who are new to HF operation have to consider is what kind of antenna to put up. The ideal antenna for HF operation would be inexpensive, simple to build and exhibit low SWR on all nine HF bands (this simplifies matching the antenna to the feedline). The most widely sold commercial wire all-band antenna, the G5RV, usually meets only one of these criteria: it is simple to build.

A better approach from a cost and performance standpoint is to build a ZS6BKW multi-band dipole. This antenna has low SWR across the lower half of the 40m band, across all of the 20m, 17m, and 12m bands, and across the upper half of the 10m band. The antenna also exhibits a moderate SWR (2.5 – 3) in the lower portion of the 80m band. The automatic tuners that are part of most modern HF transceivers will easily provide a good impedance match across the upper half of the 40 m band as well as the lower portions of 10m and 80m. This antenna displays high SWR (> 4.0) on the 60, 30, and 15m bands. Depending on the range of your antenna tuner, operation may be possible on these bands as well.

The ZS6BKW antenna, shown in the diagram below, is a very simple antenna, consisting of four components:



1. A radiator made from 93' 10" of #14 stranded, insulated wire, that is split at the center into two pieces each 46' 11" long.
2. A series matching section made from 39' 3" of 450-ohm ladder line with a velocity factor of 90%.
3. 50-ohm coaxial cable that connects the matching section to the transceiver
4. Insulators for both ends of the ladder line and the ends of the antenna wires.

The wire is available, either by the foot, or in 500-foot rolls at most home improvement stores in a variety of colors. There are a number of on-line suppliers of 450-ohm ladder line, the dog bone insulators, and 50-ohm coaxial cable, but vendors selling these items are also found at larger hamfests in our region.

Construction of the antenna is straightforward. Cut two pieces of #14 wire a bit longer than the diagram calls for. Cut a piece of ladder line 39' 3" long. One end of the ladder line is connected to the antenna wires. There are a number of ways to do this; one simple way is to pass one end of each antenna wire through the hole at the end of the center insulator and tie the wire in an overhand knot, leaving a short length of wire on one side of the knot that can be stripped of insulation and soldered to the ladder line. When this has been done for each side of the antenna, then pass a ladder line conductor whose end has been stripped of insulation through each of the center insulator holes and solder them to the antenna wire. The far ends of the antenna wires can be connected to end insulators, but another option, which makes it easier to pull the antenna up through tree branches, is to tie the antenna wires to their support ropes using a sheet bend. (The sheet bend is a simple knot that is very strong – there are several good YouTube videos that show how the knot is tied.)

This antenna can be mounted between two trees using support ropes, or as an inverted-V with just one tall center support. For good results, the antenna should be mounted as high as possible, certainly at least 30 feet above ground.

Once the antenna is up in the air, the SWR should be checked across 40, 20, 17, 12, and 10m bands. The SWR should be acceptable in the five bands for which the antenna is designed, but if it is not, it may be necessary to adjust the length of the antenna wires. If the antenna covers only a small portion of the bottom of 40m, or it shows a low SWR at the bottom of 10m, it is likely too long, and the wires should be trimmed. Trim both wires by the same amount, typically no more than ½ inch at a time. If the antenna covers the top portion of 40m, it is probably too short. It will be necessary to add wire to each side of the antenna. There is no really good way to do this, except to start over with new antenna wires that are an inch or two longer. When the SWR values are less than 2.0 across at least part of each of the five bands for which this antenna is designed, the antenna is ready to be used.

There is an excellent YouTube video done by Brad AE4VJ and me that covers construction of a ZS6BKW antenna. Here is the link:

[Say Goodbye to that G5RV! Look at the ZS6BKW - YouTube](#)

Good luck and have fun on HF ...

73,

Marc N4UFP

# THE YCARS BONEYARD

**A place to sell, trade or find Ham related Equipment**

NJ4Z – John Gendron has two Kenwood TH-F6A handhelds with accessories \$ 530.00 for the pair. Contact [NJ4Z@YCARS.ORG](mailto:NJ4Z@YCARS.ORG) for details.

WN4DVJ – Bill Wells is listing a TYT-MD9600 DMR Mobile unit for \$200.00 and a TYT-MD380 ~~DMRRM~~ Handheld for \$60.00 Contact Bill for details at [Bwells@comporium.net](mailto:Bwells@comporium.net) or 803-417-7117

KN4KCD – Ron – FT-70DR/DE HT from Yaesu. It is NIB, never fired up, asking \$140.00. [KC4KCD@YCARS.ORG](mailto:KC4KCD@YCARS.ORG)

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

W3PAL – Andre – FTDX3000d for sale. I want to offer this for club members first, before I advertise it elsewhere. The radio is in excellent condition. Non-smoking shack. Everything works as it should. The radio has an optional 300 Hz roofing filter (\$200 value) and a Voice Recorder board (\$70 value). Original box, manuals are included. Asking \$1,250 Andre, W3PAL (704) 231-4095 [aeivanov@comporium.net](mailto:aeivanov@comporium.net)

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



**Jeff Blythe – KA4WYC's  
Wild Yella' Chicken Coup**

## ***From What You Don't Know, To Knowing CW...!!***

I know you've heard me talk about wanting to RE-learn my Morse Code, or CW. In 1979 - 1980, when I got my Novice License, Foxtrot Charlie Charlie, or the FCC, required Morse Code as a testing Element to obtain a license. Entry level Novice, to General, and the 'Never Take another exam', Extra...! Novice required 5 WPM. General was 13 WPM. And Extra was 20 WPM. I've heard people say, "The reason I didn't get my license sooner, was I just couldn't pass the Code!!" In Feb. 23<sup>rd</sup> 2007 the FCC removed the requirement to use Morse Code as a testing Element for any Amateur Radio license. People said that would be the downfall of CW. Others said Amateur Radio would be inundated with people from 27 Mhz. (the Citizen Band.) The 'New' Extras were called Extra Lites, because they didn't have to learn the Code to get their licenses. First, let me say, that the Rumored demise of Morse Code has never been affected

by the removal of Morse Code in the testing Elements...!!! The lower portions of the HF bands have never been busier.

Now, my reason for this Article. IF CW is no longer required, why does it take 6 months, to a year, to obtain a seat in CW Academy ( [www.cwops.org](http://www.cwops.org) )?? I Registered in April and got the last Session of the year in the September – October Session. I got lucky...!!! They offer Sessions 4 times a year. These are usually divided into somewhat local areas around the world. I'm on the East Coast, so the Members of the class were in Fla., SC, NC, and Va. We started with 6 students. But due to some conflicts, 3 dropped out, which left us with 3 students and an instructor. There are 18 Sessions total in Level 1. You have a session, two days a week, lasting about an hour a Session. You learn the 26 letters of the Alphabet, 10 Numbers, and a handful of Prosigns and Punctuations. These are divided into each Session, Letters, Numbers, and Prosigns, at different times. It uses the Farnsworth method of learning. You learn; E, T, A, N, 4 in the first Session. You have a script to go by and use an Online Morse Code Tutor called 'CWops Morse Code Trainer', by S. C. Phillips, when you're not in class. Oh, as a MUST, you'll need a Code Oscillator or a HF rig, that has one in it. You're not Transmitting on the air, but just so everyone else can hear your Code, as you send. We gather Online each Session using Skype. The instructor will send to each student a word from the list, and then the student will send a word back to him. Each student will get a turn with the instructor. As the others are copying and sending, you should try to copy theirs too. You are not only hearing the GOOD Code from the instructor; you try to copy your Classmates...!! Not an easy task. Oh, one thing I left off, you have to practice, PRACTICE, AND STILL MORE PRACTICE. CW Academy requires you to practice an hour each day, 7 days a week, INCLUDING days you have a class....!!! Oh MY....!!!!

I'm coming to the end of my Session of Level 1 of CW Academy. I can send, fairly reliably at 20 WPM, but can only copy at 10 WPM. It's WAY easier to send than copy. One requirement to receive a Certificate Of Completion, that you can receive 10 WPM. You should have 'Instant Character Recognition', ICR. That is, as you hear the Dits and Dahs, you instantly KNOW that character. You must attend 90% of the Sessions. I found our Instructor VERY helpful in helping students, if for some reason they missed a class. He even helped one at a different time, to make up a Session.

OK, so the BIG Question on everyone's mind is, Jeff, did you pass...???? Y E S ! ! ! Again, so did Gary, W4GDC, in a previous Session...!!!! So if we can do it, so can you....!!!! Hey as a side note, CW Academy is starting a short class between Level 1 and Level 2. This is to help those students that need a little more training before continuing to Level 2. And before you ask, YES, I'm going to take it. This is a new Class that they've just started. So wish me luck...!!

Other than CWops.org, If the time restraints won't meet your schedule, try looking at The Long Island CW Club, W2LCW, ([www.longislandcwclub.org](http://www.longislandcwclub.org)). They are more Self-paced. You also have a bunch of online Programs out there, too. Like The Koch Method for CW Tutor, ([www.G4FON.com](http://www.G4FON.com)). There's 'Learn It Online', ([www.lcwo.net](http://www.lcwo.net)). Another self-paced online program. It keeps your progress, as you learn the characters, and scores how well you're doing. Just Google CW Trainers or Tutors and have at it...!!!!

I hope you have enjoyed my walk through Re-learning The Code...!! Just remember, CW is a Mode, like AM, FM, and SSB. Morse Code is a Language. But they are used synonymously...!! Dah Dah Dit Dit Dit, Dit Dit Dit Dah Dah - (73) Jeff KA4WYC

# YCARS News and Updates

YCARS MEMBERS AND SUPPORTERS

## Be YCARS Aware

Be YCARS Aware

NEW YCARS MEMBERS  
WELCOME TO THE  
FAMILY

New members for May  
2021

K4BAX – Ana Goforth

KO4PQU – Steve Hackett

N4YD – Bryant McMurry

KI4NCV – Rob Evosevich

YTD new members for 2021 -28

## YCARS In Action – Communications Support for the Det. Mike Doty Memorial 5K

The YCARS Community Service provided communications support for the Detective Mike Doty Memorial 5K. The race took place in Fort Mill on Saturday, May 15, 2021.



**DETECTIVE  
MIKE DOTY**  
MEMORIAL RUN

Approximately 20 club members volunteered their time a beautiful Saturday Morning. YCARS had an informational and demonstration booth set-up to promote Amateur Radio and the club.



YCARS VP Philip, KM4WLS and Vicki W4NQX greet folks visiting the YCARS booth



## **YCARS Elmering Workshop –Saturday June 19, 2021 – 11:00 – 12:30**

YCARS will host an in-person Elmering Session on June 19<sup>th</sup> immediately following the VE testing session. This session will be concentrating on familiarizing new hams and newly upgraded hams with the equipment the club will use for ARRL Field Day. The K4Ytz Radio-Sport team will be there giving hands on training with the Icom IC-7300 and Yaesu FT-991A transceivers.

## **Women at YCARS (WAY) Ladies Night and POTA activation.**

The Women at YCARS group held their first Ladies night at the clubhouse to promote Women in Amateur Radio. The group also held a POTA activation on May 30<sup>th</sup>, 2021 from K-8145 Worth Mountain Wildlife Management Area in western York County. Hillary, AB1CD and Vicki, W4NQX logged 260 contacts. The Yoda of POTA, Steve W3SPC accompanied the pair to provide guidance and encouragement to the ladies on their first solo activation.



## **ARRL Field Day 2021, June 27 & 28, 2021**

YCARS and the K4Ytz Radio-Sport Team will be participating in the annual ARRL Summer Field Day Event. YCARS will be operating in the field from Westminster Park in Rock Hill.

For our new Hams and those unfamiliar with ARRL Field Day, tens of thousands of operators and clubs from the entire country participate to make contacts. Although it seems like a contest, the “True Spirit” of ARRL Field Day is to provide an opportunity to simulate field operating conditions in emergency situations. Individual operators and teams of operator’s set-up and operate in the field while others operate from emergency operations centers.

YCARS plans to operate portable on emergency power from Westminster Park in Rock Hill, SC. K4Ytz will begin setting up stations on Friday after 14:00. Rules Prohibit and setting up antennas and stations greater than 24hrs before the beginning of the event. YCARS needs your help to build a Field Day team. A Signup Genius page had been created. [York County Amateur Radio Society: Field Day 2021 \(signupgenius.com\)](https://www.signupgenius.com). We encourage all YCARS members to participate in Field Day Operations. The plan now is to operate as a 3A station (Temporary Shelter and Emergency Power). Running 3A allows the team to run 3 transmitters plus a Bonus Station (GOTA) simultaneously on the air. Of course, if we cannot fill-out the schedule to run 3 stations for the full 24 hours, we will run as a 2A station. The Bonus station we will operate is our “Get on the Air” (GOTA). Unlicensed, new hams (licensed less than 1 year) and newly upgraded operators (upgraded in the last 12 months) are eligible to operate on the GOTA station. Please encourage your friends, family and children to come out and share your passion for

Amateur Radio. We will have some prizes for those who make 20 contacts on the GOTA station. YCARS and Team K4Y TZ operate field day in different ways in different years, depending on the field day organizer goals. This year, TEAM K4Y TZ's goal this year is to operate in such a way that we win our operating class nationally. We not only want to be the best station in the state of South Carolina, but the best in our operating class nationally. We have such talented operators in this club, we should be able to achieve this goal, provided we can keep all the stations on the air on 24 hours continuously. Once you register for a time slot to operate you will be assigned a band, operating mode and assigned to be a calling or hunting station. It is expected that you will not deviate from the assigned operating format as it may cause interference with our other stations. The Field Day equipment and antennas will be provided by the club, participants will not need to bring any radios or antenna. This will limit any interference between stations and antennas. This event will not only be a serious operating event but it will be a fun event with opportunities to socialize with club members. We will have a campfire on Saturday night, we encourage all club members to come out and socialize with other members and families during the set-up and event. We are very much looking forward to having a wonderful, safe and successful Field Day 2021.



## **Up for some Adventure? Save the date Saturday, July 31, 2021 YCARS Club Picnic and POTA activation.**

YCARS will hold the 2021 club picnic at Andrew Jackson State Park, July 31<sup>st</sup> in conjunction with a club foxhunt and Parks on the Air activation. So, come out, bring the family and join the club for some fun and the adventure that is Amateur Radio. More details to follow...

## **Local Hamfest Updates:**

The Shelby Amateur Radio Club will hold the Shelby Hamfest, September 3<sup>rd</sup> through the 5<sup>th</sup>, 2021 – Cleveland County Fairgrounds.

The Carolina Amateur Radio Emergency Services Club is holding the Gaffney (SC) Hamfest on Saturday, Oct. 23, 2021 at the South Side Baptist Church, 204 W. O'Neal St. Gaffney, SC. 08:00-15:00



YCARS is proud to recognize the achievements and awards earned by club members this month.

If you have earned a Ham Radio Award you wish to share with the YCARS family please let us know.

Darcy Pach, K4DQP – Parks on the Air – Wiggin’s Acalpha Award – Contacts to 700 unique POTA entities

John Gendron, NJ4Z – Parks on the Air – KILO Award – Devil’s Fork State Park  
Earned for 1000+ contacts from a single POTA entity

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The York County Amateur Radio Society

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