

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.7– Octogenarian Observations
- Pg.8 – YCARS in Action
- Pg.9 – Ask an Elmer
- Pg.13 – The Workbench
- Pg.14 - YCARS Boneyard
- Pg.15 – YCARS Club News and Updates
- Pg.17 YCARS Wall of Arrogance

July 2021 Club Activities

- Every Wednesday 18:00 local – Club open House
- Thursday, Sept 2nd- Radio Room Operating Night 18:00-20:00
- Thursday, Sept. 9th – Business Meeting – Clubhouse/Teams 19:30
- Friday, Sept 10th – Monthly Simplex Net – 21:00
- Saturday, Sept 11th – Club participation day
- Thursday Sept 23rd – 19:30 Presentation Night
- Friday Oct 1st – Rock Hill Hamfest set
- Saturday Oct 2nd – Rock Hill Hamfest 08:00 – 15:00

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.7 July 2021

Hello everyone,

It is great to be back after a one-month hiatus for the newsletter, as the month of July was much busier than anticipated. We have quite a bit of catching up to do.

There is much exciting news this month and we are getting revved up for several hamfests in the region, including our own.

In From the Hamshack – NJ4Z muses the events of July and having a month to relax.

Chase Palmer, KJ7OXM shares with us his journey into Ham Radio after a chance meeting on our local net, led Chase to our Club Picnic. He wanted to share how Ham Radio helped him and his family after a tragedy in our “Getting on the Air” feature.

Joe, W8DKR gives us a history lesson that moves from oscillators, amplifiers and computers, doing double duty this month in his Octogenarian Observations column.

John, NJ4Z tackles an often-asked question regarding the prediction of HF propagation and what data to use to make an educated guess in this month’s “Ask an Elmer” feature.

We move from HF propagation to tracking aircraft, in our “YCARS IN Action” feature. Darcy k4DQP details the system and shares the great news that YCARS was approved to receive a commercial ABD-S receiver to be hosted at our club house to provide data for website FlightAware.

On the Workbench this month, NJ4Z details the construction of a low cost, lightweight, and versatile 12-volt antenna rotator.

And as always, we have the Boneyard, YCARS AWARE and Wall of Arrogance columns as well as, a welcome to new club members. We also express our congratulations to those who earned our upgraded their tickets.

Please consider writing an 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

73

The Transmitter Staff

September 2021 Contest

9/4 – All Asia DX -SSB
Contest 00:00UTC

9/11 – Worked All
Europe – SX - SSB
Contest 00:00UTC

9/11 – TX QSO Party
14:00 UTC

9/11 – ARRL VHF
Contest 18:00 UTC

9/12 – NA Sprint CW
00:00 UTC

9/18 – NH QSO Party –
16:00 UTC

9/18 – NJ QSO Party –
16:00 UTC

9/19 – NA Sprint -
RTTY – 00:00 UTC

9/25 – CQ WW – RTTY
– 00:00UYC

9/25 – ME QSO Party –
12:00UTC



From NJ4Z's Hamshack

Musings from the Editor

July was a very busy month, the 13 Colonies Event the first week of the month, the "POTA Support Your Parks Plaque Event" in the middle and the Club Picnic at the end.

Once again 13 Colonies did not disappoint, it was an amazing event, and I would remiss if I did not mention having the opportunity to work club member Scott, KV9G as he was K2L "South Carolina." Scott is an amazing operator and it was a privilege to be able to have in the log as the operator of K2L. I was also impressed by the North Carolina – K2J team they logged the most contacts of any of the special event stations. I managed to work them all the colonies' stations and the 3 bonus special event stations, GB13COL was difficult, and conditions were not very favorable. I hope next year to have the chance to be one of the operators for K2L, I think it would be an awesome time. You all know how much I love working pile-ups.

Speaking of pile-ups, the Support Your Parks Plaque event was just a wonderful experience. I cannot thank Steve, W3SPC enough for making the arrangements for the campsites and hanging the antenna at Oconee State Park. Having the opportunity to just play radio with two of your best friends for a long weekend is surreal. We had an absolute blast while performing at a high level. We ate good, laughed loud and often, watched movies and logged Q's at a great rate. We decided to run one radio and work in shifts. Another big nod to W3SPC for handling the late-night shifts. Darcy and Steve were kind enough to allow me as much radio operating time as I could handle so that I could work towards a K1LO award from the park. In the end we managed to log 1943 contacts in 42 hours of operating time, placing the team at the top of the club category. We earned the top prize for Team K4YTZ. We cannot wait to hang that plaque in the clubhouse, it will be the first of many, I suspect. I also want to thank Vicki, W4NQX for operating at two parks under the N4YTZ callsign representing the club.

To cap off the month, we had a wonderful club picnic, it was the first chance for the club to gather, since this Covid mess started 16 months earlier. It was great to share fellowship with so many of our members, make new friends and catch up with old friends. It had been way to long and almost felt normal for at least one day. I want to thank all who helped pull off the picnic. All the variety of dishes, salads, and desserts were just simply delicious and I ate way too much. I want to give a special mention to Lynn and Philip Chandler, KM4WLS for the unbelievably good home-made ice cream.

With all that was going on in July, I just did not have time to put together the newsletter for August. I am sorry if any were disappointed, but it was really nice to have time to relax and enjoy the radio, compete with friends and share fellowship with club.

The month of September may have been a better choice for taking a month off, considering the all the activity and effort preparing for the Rock Hill Hamfest. I am really hoping for a safe and successful event this year.

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?!



My Journey into Ham Radio – Chase Palmer, KJ7OXM

Greetings from 4800 feet in the mountain cities, on the west side of the beautiful Rocky Mountains, where the air is dry, the summers are hot, and winters are freezing.

My name is Chase Palmer, KJ7OXM, from Orem, Utah. I was invited by the lovely Miss Vicki, W4NQX to write this article about my journey in ham radio and how it has changed my life. My hope is that my experience can help encourage a new generation of operators out there who may be facing similar

challenges to the ones that I faced.

I’m really not sure what would prompt a shy guy like me to get my ham radio license. I have always been a very shy guy. Some would say that I am the very definition of what an introvert is. I find that I can be perfectly content with just my thoughts as company. Shyness has always been a challenge for me to overcome, both in my personal life and in my professional life. My interest in ham started around 1999 when a neighbor got his license with his dad. He was excited about it and said I should get my license. I borrowed some library books and tried to study, focusing on Morse code, not knowing at the time that the requirement had been removed. At 14 years old I was more interested in playing baseball, football, and skateboarding than I was with code, so I eventually lost interest.

In April 2020, my wife and I were expecting the birth of our second child, and received the devastating news that our son had passed away and was born still born at 40 weeks. I was in a bad place and didn’t have a lot of people to talk to. As I was trying to navigate my new world, I was looking for a new hobby to try and keep my mind occupied. It was around this time that a friend and neighbor of mine approached me and wanted to know if I’d be interested in ham radio. We talked about my early experience with studying, but once I found that Morse code was no longer required, I jumped right on board. We both got our licenses on 30 June 2020.

My First Contact

I was so excited to finally have my ham radio license. I had my new radio all programmed up with some local repeaters, but I couldn’t bring myself to push that PTT (remember, shy guy here). Every time I’d get ready to push the button and put my callsign out there, my heart would start to race. What if I made a mistake? Was someone going to call me out on it? What was I going to talk about?

After a month of this, I mustered up all the courage I could find and said, “This is K-J-7-O-X-M, looking for my first contact, is anyone out there?” And guess what happened? Nothing. No one answered. I felt like I was going to pass out from the adrenaline that was pumping through my veins. I thought for sure someone was going to reply back and I had worked myself into such a panic about what I was going to say and if I was going to hear their callsign. I decided that that was enough excitement for one night, so I didn’t try again.

A few days later, I decided it was time to try again. I stood up on the chair in my backyard, took a deep breath, and in a very winded voice (I didn't realize that I was still holding my breath), I said, "This is K-7-O, uh, oops, I mean K, um..." (Oh shoot! Did I just forget my callsign? Now my heart was really racing) "...okay, this is K-J-7-O-X-M, looking for my first contact. Is anyone listening?" No one. What was I doing wrong? I tried again. "This is K-J-7-O-X-M, looking for my first contact. Is anyone out there?" and this time someone replied! It was a very rough contact, we really struggled to hear each other, but we finally were able to get our callsigns exchanged. He told me that he was having a hard time hearing me and after a couple of exchanges we ended our conversation. It turned out that the repeater I was trying to reach was VERY far away and according to this ham, nobody used the repeater on a regular basis except for a couple of hams that had a daily rag chew. He had just happened to be scanning through his frequencies and heard me. My first contact was on 30 July 2020 with WK8G.

A few of things that I learned from my first attempts:

1. I made a mistake and nobody got after me about it.
2. Hams are very friendly and are almost always willing to help out. Turns out that hams love hearing new voices on the radio and are excited to have someone else join the hobby.
3. I needed someone to help me show me the ropes, because I had no idea what repeaters to use.

I was pumped to have made my first contact! But I knew that if I didn't keep it up, I was going to lose my interest to other things that didn't require me to stretch myself so far outside of my comfort zone. Since then, I've tried to make one contact each day. I haven't been perfect in that goal, but I can say that pushing the PTT has become a lot easier for me.

Net Control

A short time later, I joined the local club, the Utah Valley Amateur Radio Club (UVARC). It was through the club that I found out that the club held a weekly "New Ham Net" on Thursday nights, geared towards those who are new to ham, and those who aren't but feel like they are. On the net, someone would provide a short training item that would help new hams remember the bits and bobs that they memorized for the test and quickly forgot. These trainings would also help new hams learn some of the ins and outs of ham radio that maybe weren't covered on the test. Everyone would then get a chance to say a few things if they felt like it. It was a safe place to make mistakes and learn.

I would check into this net each week, but I wouldn't really say much. I just enjoyed hearing net control acknowledging me. That meant that my magic little box was actually working and someone could hear me. After another month, I was invited to be the net control operator for the following week's New Ham Net. I accepted the challenge, but now I had a new worry. How was I going to hear all of those call signs being thrown at me? I decided that I was going to spend the next week listening to all of the nets that I could with a pen and paper and would try and copy all of the callsigns as they came in.

When Thursday night rolled around, I was anxious and excited. I sat down at my desk with my HT plugged into my new J-Pole antenna that I had recently mounted and was ready to go. I had my net control script in hand and pen and paper ready to start taking down callsigns. I keyed up and started "This is Chase Palmer, KJ7OXM, for the Utah Valley Amateur Radio Club New Ham Net..." suddenly all of those nerves went away. I was actually having fun!

Impact of Ham Radio

Ham radio has had a significant impact on my life. During a time when I needed friends the most. A connection with other people to help me through a difficult time, I found that through ham radio. In my work, I have found that I have a lot more confidence in myself and speak up more often. This has resulted in me getting promoted quickly and managing a team of Cybersecurity Analysts.

I have met so many wonderful people over the last year that I would have never imagined I would be meeting. People who have made an impact in my life, whether they know it or not. At the beginning of August 2021, my family and I travelled to South Carolina to head to Pawley's Island for a family reunion. We flew into Charlotte, NC so we could see some friends who had recently moved to Rock Hill for a job. The night that we flew in, I tuned into the 147.03 repeater only to hear a net going on. I don't know what prompted me, maybe the humidity was getting to me, or maybe it was the sweet southern accent from the net control operator that seemed so inviting, but I quickly hopped out of my chair and ran outside so I could get a better signal and checked into the YCARS 2 Meter Evening Net. Net control operator, Vicki Carnes (W4NQX), checked me--and my son, Kason--into the net. Then, to my surprise, I was invited to the club barbecue the next day. Now, why would a shy guy like me go to a barbecue with a group of people that I have never met, in a place I've never been? I have two answers: First, ham radio joins people from all over the world in a common interest. Just about anywhere you go, there is going to be a ham radio operator or two, and you already have something in common. It's like having a family everywhere you go. Second, the fine members of the York County Amateur Radio Society are some of the kindest and most welcoming people I have ever met. We enjoyed our time at the barbecue and it ended up being one of the highlights of our trip. My wife and father-in-law kept telling the rest of the family about the impromptu change to our plans, all because of ham radio.

The Rest of My Story

I quickly caught the bug and on 23 November 2020, just five months after getting my Technician license, I passed both the General and Amateur Extra exams. I enjoy spending time outdoors camping and hiking. I take an HT with me everywhere. My son Kason loves spending time with me on the radio and loves talking on the radio. One of the most exciting and memorable events was when, as 3 years old, Kason checked into a local net on my behalf without any help. I love that he knows my callsign and seems fascinated with the radio.

I am a Volunteer Examiner with the WY5I VEC and have helped administer over 150 elements in just a couple of months. I am a volunteer with our local ARES and RACES groups and have helped with several parades and races. Most recently started a brand new weekly 2 meter single sideband net for UVARC in order to drive more interest in some of the lesser known areas of the band and to show our club members that there is a lot that can be done with just a Technician license.

I have found a lot of enjoyment in HF digital modes, such as FT8 and PSK31. In my shack I have a Yaesu FT-991A on an 80-meter end fed half wave antenna and a dual-band open stub j-pole.

I look forward to many more years of fun and excitement as I continue to explore ham radio and meet new friends.

Feel free to reach out to me at kj7oxm@arrl.net if you have any ham radio or security questions.

Octogenarian Observations with Joe W8DKR

We are so pleased to have a Two-for-One Month with our favorite Octogenarian - W8DKR

Food for thought (no homework). In the 1970's before analog integrated circuits were available, an experienced RF engineer told me that if you wanted to build an oscillator then first build an amplifier and if you wanted to build an amplifier then first build an oscillator. This sounds crazy! He was talking about feedback where part of the output is feed back to the input. In an amplifier you may want negative feedback to stabilize the gain and increase the bandwidth. Whereas in an oscillator you want positive feedback to sustain oscillation. Positive feedback is in phase with the input and negative feedback is out of phase with the input. An amplifier needs an input whereas an oscillator needs no input except for a small amount of the output. In the olden days you sometimes had to kick an oscillator to start it hence the name "boot" came about. When you "boot" a computer you start it up.

Also, in the 1980's and 1990's there was a 'saying' going around in the computer world. "Whatever Andy (Andy Grove of Intel) gives, Bill (Bill Gates of Microsoft) takes. As Andy's Intel made faster microprocessors and larger memories, Bill's Microsoft gobbled them up with more obfuscated code.

September 2021

If you look at a photo of internal parts of a microprocessor chip you would see areas that look like a farmer's field and other areas that seem to have no pattern.

The farmer's field are memory areas in the microprocessor chip called the "cache". This is a small about of memory where frequently used code is stored.

The reason the cache is in the microprocessor chip is to save time in accessing it. Remember (distance = rate x time) or (time = distance / rate). Since time (clock speed) is fixed, then the access time is reduced by putting the cache internal to the microprocessor chip. The computer main memory is on the system board (mother board) located a few inches away from the microprocessor and would take more time to access. The other area of the microprocessor chip contains the logic and other circuits. The logic of the microprocessor is executed in device called a Program Logic Array (PLA). This area is first manufactured as all 'NAND" gates or all "NOR" gates and then is interconnected to form the computing part of the microprocessor. An entire college course is needed to explain how the PLA works. See September www.onechipsystems.com for examples.

YCARS IN ACTION

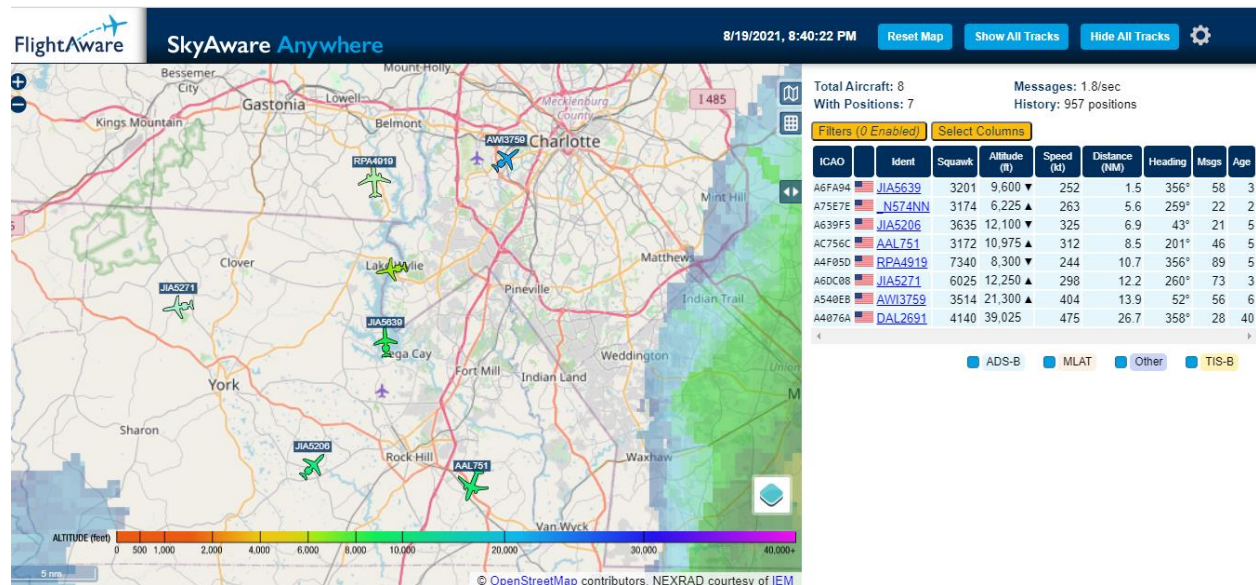
YORK COUNTY AMATEUR RADIO SOCIETY

YCARS To Install Real-Time Flight Tracking Hardware, K4DQP

Have you ever tracked a flight on the internet or checked the screens at the airport to see when a flight would be arriving? Do you know where the data comes from?

Many people don't know that most civilian aircraft are required to use Automatic Dependent Surveillance-Broadcast (ADS-B). In simple terms, aircraft have a device that sends out data every few seconds via VHF (1090 Mhz). Data includes aircraft identification, current position, altitude and velocity. This data is collected by both commercial entities and volunteers and then relayed to various flight data collection sites. From there, the data is sent to flight tracking websites, airports and other entities.

FlightAware (www.flightaware.com) is one of the most popular websites where people from all over the world feed their local flight data from home-built receivers using a Raspberry Pi, SDR dongle, an antenna and an internet connection.



Screen capture from FlightAware

YCARS was recently approved for a free, professional grade FlightFeeder to be installed on one of our towers. The kit includes the feeder device, antenna, filter and cabling. Our device will likely be receiving

and processing aircraft VHF signals from >200 to 400 miles away. FlightAware was excited about our organizational mission, our remote clubhouse location and ability to install the device on our tower.



Building your own flight tracker and installing one at your home is not only an interesting project, but you'll learn about VHF signal propagation, have access to real-time flight information from your own flight tracking system and get free access to premium content FlightAware.

If you are interested in building your own ADS-B device using a Raspberry Pi, navigate to <https://flightaware.com/adsb/piaware/> or contact me directly at k4dqp@ycars.org. I'm more than happy to assist.

"Ask an Elmer"

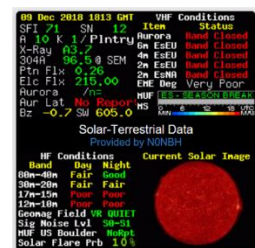
Ham Radio Advice and Answers

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 –

Predicting HF Propagation Based on Solar-Terrestrial Data – John Gendron, NJ4Z

One of the most often ask question of me by new Hams is; "How do I know what kind of propagation there is going to be today?"

That is a loaded question, because we know as experienced Hams, propagation and the conditions for propagation can change rapidly, and vary in different areas. This is especially true for 6 and 10 meters. My go to answer is "It depends, what band, what time of day and between what two points." I get a lot of befuddled looks, and some looks of frustration. What most new Hams do not realize understanding propagation is part science and part art. The science part is somewhat easy, there is plenty of data to help sort that out. The art, well that takes experience to learn what time of day to look for different points on the globe on differing bands and what season is better for what bands. No one knows for sure what propagation



will look like on any given day, but there is data that can be used to make an educated guess, and experience will give you more accuracy in that guess.

The Sun is the engine that drives electromagnetic wave propagation in the earth's ionosphere. The sun's radiation energizes the earth's ionosphere, creating positive ions and free electrons. When the ionization is high, the abundance of free electrons allows for the refraction of radio waves.

As we learned in our license study courses the ionosphere is made up of multiple layers of ionization. The layers all respond differently to solar radiation and to radio frequency waves. These layers are also not uniform in density of ionization. Think of it more like cotton candy than a solid surface, in certain areas the density will be higher and allow for higher maximum usable frequencies (MUF). With higher MUF, there is better propagation on more bands. Again, this tends to be a local factor and not homogenous throughout the ionosphere.

During the climb to the maximum (solar max) of the 11-year solar cycle, solar output and magnetism vary greatly. The variations in the solar magnetic field as it is switching polarity, creates areas of concentrated magnetic flux. These areas will appear darker than the surrounding area, because the magnetic flux inhibits convection and produces lower surface temperature. We call them Sunspots. The bright areas surrounding sunspots release extra radiation. This extra radiation is both good news and bad news for Hams. The extra radiation produces more ionization in the ionosphere and better propagation, but the increase in activity from sunspots and coronal holes releases more high energy particles from the sun. These high energy particle streams depending on speed and density can create disturbances in the Magnetosphere. The Magnetosphere is the magnetic field that surrounds the Earth created by Earth's spinning molten core. This magnetic field protects Earth from the intense solar radiation and gamma rays from deep space phenomena. As a dense and/or fast stream of particles interacts with the Earth's Magnetosphere field it can create geomagnetic storms (Solar Storms). Solar storms create high currents and increase plasma in the Magnetosphere. They can also create disturbances in the ionosphere, creating ionospheric storms. These storms greatly degrade HF propagation and can create radio blackouts.

For a better understanding of the mechanisms that drive Radio Wave propagation please visit: www.radio-electronics.com/info/propagation/radio_prop_list.html

For our purposes here we are going to talk about the four data points (the science part) that will help you most in beginning to understand how solar weather effects radio propagation. These data points are Sunspot number (SN), Solar Flux Index (SFI), and the two geomagnetic activity data points the K index and the A index. These 4 data points can be found on many websites on the internet. Most of the Amateur Radio Spotting clusters will have solar data listed. The site www.QRZ.com provides the solar-terrestrial data on its front page. www.hamqsl.com/solar.html is a wealth of information and has a Solar-Terrestrial data widget you can add to your own webpage or QRZ page. The National Oceanic and Atmospheric Agency (NOAA), has a specific area of their website dedicated to Solar / Space Weather and how it effects radio P\propagation, <https://www.swpc.noaa.gov>. NOAA also broadcasts Solar Weather Data at 18 minutes after the hour on WWV (5MHz, 10MHz, 15MHz and 20MHz). Additionally, the sites www.spaceweathernews.com and www.spacewaetherwoman.com are incredible sources to better understand solar weather.

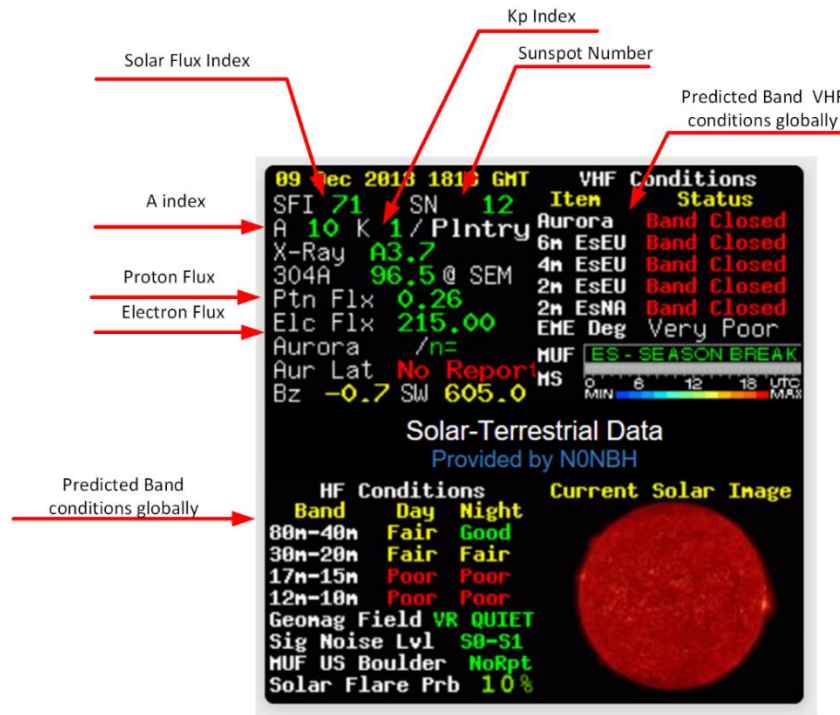


Figure 1 Solar-Terrestrial Data Widget with callouts

Having the solar-terrestrial data, we can now use that data to make informed predictions of propagation. The sunspot (SN) number is the number of sunspots currently on the solar surface. The higher values in sunspots should lead to higher radiation output from the sun and in turn higher levels of ionization of the Ionosphere. These higher-levels ionization leads to more free electrons, creating favorable conditions for radio propagation.

With an increasing number of sunspots, the Solar Flux Index (SFI) is the radio flux or noise the sun emits at 2800MHz (10.7cm) increases. The Solar flux is closely related to the amount of ionization and electron concentration in

the upper Ionosphere (F2) layer. Thus, it is a good indication of conditions for long distance radio communications. The solar flux index can range from 50 to 300. Low values of SFI will translate to low MUF and poor conditions for overall propagation. As the value of the SFI increases the MUF will rise, as will conditions for propagation. Although, high SFI values can translate into noisy bands and D-layer absorption. It is important to note that the ionization takes time, usually a few days of high SFI values will translate to good propagation.

K index to A index Conversion

K Value	A Value	Conditions
0	0	Very Quiet
1	1-4	Quiet
2	5-7	Unsettled
3	8-15	Active
4	16-27	Active
5	28-48	Minor Storm
6	49-80	Major Storm
7	81-132	Severe Storm
8	133-208	Very Major Storm
9	209-400	Catastrophic Storm

The two geomagnetic indices the K(p) and A(p) index are related. The K index is measured at observatories all over the globe. Each of the observatories has a calibrated magnetometer. A measurement taken at 3-hour intervals and the maximum deviations from geomagnetic quiet are recorded. A mathematic formula is applied to the deviation number and the K index for that location is determined. The K index can range from 0 to 9. As you increase in value the more severe the disturbance to the Magnetosphere and Ionosphere. The Kp (K planetary) is the average of all the 3-hour K indices taken globally. The A index is derived from the K

index. Table 1 shows the conversion of the local K index to the A index. The Index can vary from 0 to 400, and as with the K index the greater the value the greater the disturbance. This conversion allows for a daily average of the condition of the Magnetosphere and Ionosphere. The A index is the average of the converted 8 K index values over a 24-hour period. Being that the A index is for a 24 hours period it will be more

indicative of overall condition predictions vs the 3-hour Kp index. Keep in mind that a geomagnetic storm, disturbance in the Magnetosphere and a ionospheric storm, disturbance in the Ionosphere are very different. Ionospheric storms will be more adverse on radio communications than a geomagnetic storm.

Using these figures to interpret overall propagation is quite simple the higher sunspot numbers will normally lead to higher solar flux. The increase in solar flux over a few days period will produce greater ionization of the upper levels of the Ionosphere (E, and F layers) producing favorable conditions for the refraction of radio waves. This will allow for a higher maximum usable frequency. SFI numbers above 150 will vastly improve propagation and numbers above 200 will provide peak propagation. Lower numbers in the K and A indices will provide a more stable communication paths for RF propagation. As the K and A indices values increase the greater the instability will be and suppress the MUF, a solar or ionospheric storm at a Kp 7+ or Ap 81+ would cause an HF communications blackout.

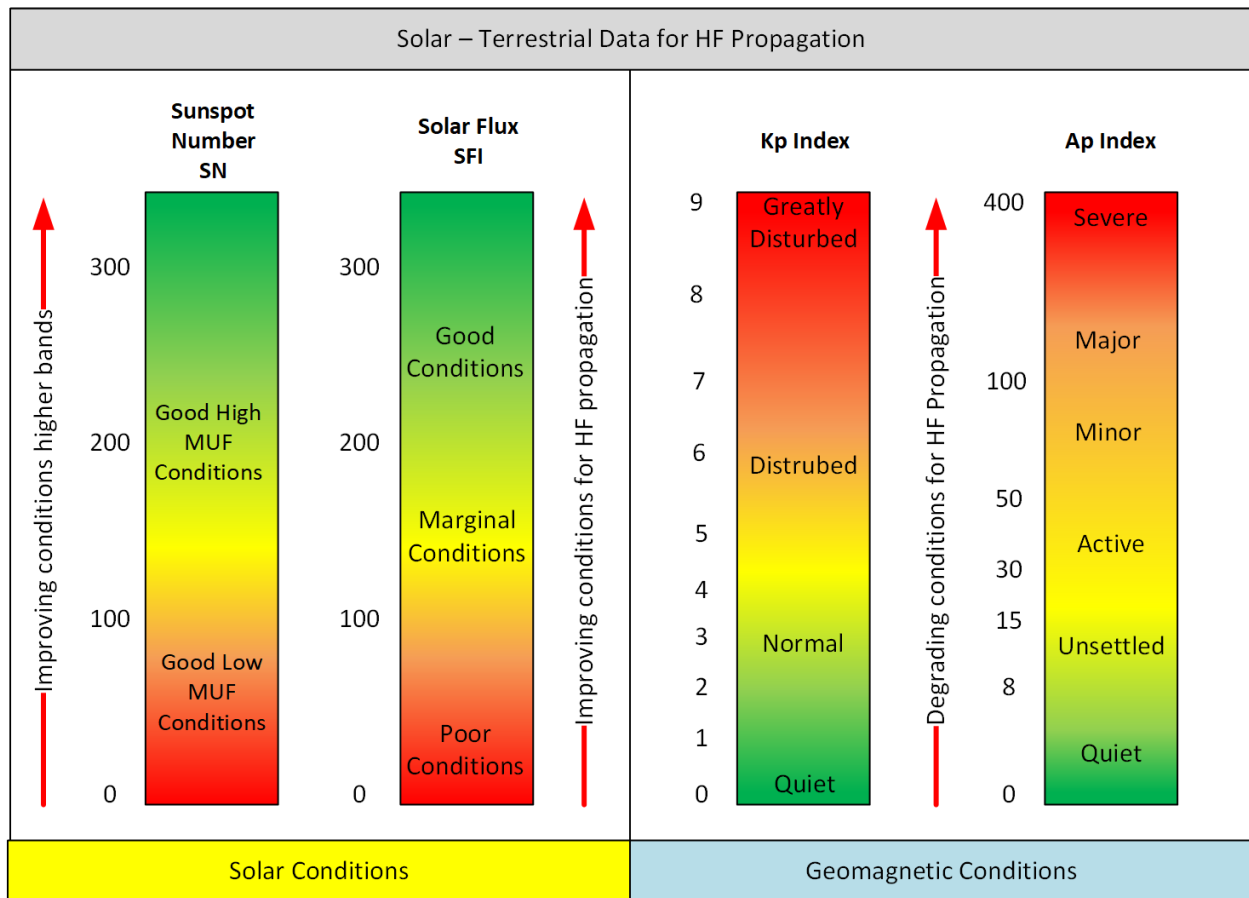


Figure 2 is a visual representation of the Solar Data and the expected conditions based on that data.

There several websites and software programs that are available to provide HF propagation from point to point, at differing times of day and on differing bands. These sites and programs are very useful for DX chasers who want to understand when and on what bands to work DX stations and the possibility of success for those communications. One of the best tools for HF propagation prediction is VOACAP (Voice of America Coverage Analysis Program) is free for download, easy to use and very accurate. <https://www.voacap.com>. Give it a try.

THE WORKBENCH

Ham Radio Projects, Tricks and Tips

Lightweight 12-Voly Portable Rotator – John Gendron, NJ4Z

After YCARS successful activation of Oconee State Park for the Parks on the Air – “Support Your Parks Weekend,” planning for the ARRL September VHF contest and POTA activation went into high gear. Steve, W3SPC, Darcy, K4DQP and I will be heading to Balsam Mountain Campground in Great Smokey Mountains National Park, to operate the ARRL September VHF contest and complete a POTA activation. At an elevation of a little over 5,300 feet (Mile High) Balsam Mountain Campground is the highest elevation drivable campground east of the Mississippi. It should allow for tremendous conditions on VHF and HF for the event.

Darcy, K4DQP has constructed a 6Meter Moxon antenna, that will sit atop a military mast. In order to rotate the antenna a small portable rotator is required. I was doing some research and came across a YouTube Video by KK6USY([This is the best and easiest way to make the 12 volt Rotor 2.0 for small light weight Yagi! - YouTube](#)) that showed the construction of a 12V light duty rotator. The heart of the rotator is a small 12v gear box motor. It is rated for 10RPM. The motor is housed in a one-inch PVC compression coupling. It is almost like it was made to fit in that fitting. I purchased the motor, a variable speed controller board and shaft 7mm shaft adapter to connect the shaft to the antenna. The parts list from amazon is below.



Motor: [Amazon.com: PLUMIA DC 12V 10RPM Gear Motor Centric Output Shaft 37mm Diameter Gearbox High Torque Electric Micro Speed Reduction Geared Motor : Automotive](#)



Controller: [LEDMOMO 1203BB 6V 12V 3A 80W DC Motor Speed Controller \(PWM\) Adjustable Motor Driver Switch - - Amazon.com](#)



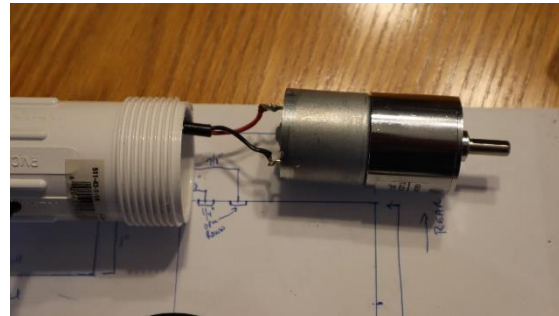
Shaft Adapter: [3 Pack 7mm Flexible Coupling Connector with DN25 Pipe Cap for Cup Turner Motor Kit- Plus 2 Wrench & 6 Screws: Amazon.com: Industrial & Scientific](#)



I used a 1" PVC with a threaded adapter to complete the motor housing. To mate a piece of 1-1/2" PVC used as a sleeve over the military mast, I connected a 1-1/2" to 1" threaded PVC reducer. The allowed for a mating of the 1" threaded adapter and the reducer.

A 1/4" hole was drilled midway down on the side of the compression coupling, for the power cable to escape the motor housing. I used some silicone to seal the opening around the cable. I used a 12V 5.5mm DC connector and soldered it on to motors power terminals.

The motor controller will be housed in a 4" x 3" x 1" box 3D printed by Steve, W3SPC. We will use 18ga 2 conductor cable to build a power cable from the motor controller to the rotator connection. The Controller will be wired with power pole connectors for the DC power connection. The PVC parts and 18ga 2conductor wire can easily be sourced from Home Depot, Lowes or most hardware stores.



This rotator can be adapted to many different masts with different adapters for PVC, metallic conduit or fence rail. It is an easy, inexpensive build that can be completed in an afternoon.

THE YCARS BONEYARD

A place to sell, trade or find Ham related Equipment

KN4KCD – Ron – FT-70DR/DE HT from Yaesu. It is NIB, never fired up, asking \$140.00. 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

K4Y TZ – the club has several items for sale – please see [YCARS Boneyard – Page 1 – K4Y TZ – YCARS](#) for details.

YCARS News and Updates

Be YCARS Aware

TEAM K4YTZ – Brings Home the Hardware

The York County Amateur Society contest team activated K-2908 Oconee State Park in South Carolina for the Parks on the Air "Support Your Parks Plaque Event" (July 17-18). Steve Czaikowski, W3SPC (captain), Darcy Pach, K4DQP and John Gendron, NJ4Z operated portable from the park for 42 of the 48 hours event. The team managed to make 1943 contacts for event, finishing first amongst all the club activators and first overall with the number of contacts for all competitors. Vicki Carnes W4NQX, activated two parks under the N4YTZ secondary callsign and made 108 contacts for the event. The team also has the distinction of completing a KILO in a 24-hour period logging 1017 contacts on 7/18/2021. A very nice plaque will be heading to the clubhouse very shortly.

Club Participation Day, September 11th 2021

The Club will be holding another Club Participation Day on Saturday September 11th, 2021 cleaning the clubhouse and attic, yard maintenance, finishing fence around A/C units and other undefined tasks. Start time will be 9am.

NEW YCARS MEMBERS
WELCOME TO THE
FAMILY

New members for
July/August 2021

[Jeremy Writz – AA4JW](#)

[YTD new members for 2021 -32](#)

Rock Hill Hamfest named ARRL SC Section Convention for 2021.

The Rock Hill Hamfest was awarded the ARRL SC Section Convention Honors. The Hamfest will be held on Oct. 2nd 2021. Volunteers will be needed for set-up, day of and tear-down for the event- more to follow during the September Business meeting.

YCARS Table at Shelby Hamfest, September 3rd, 4th and 5th 2021

The Club will have a table at the Shelby Hamfest. We will be promoting our club, and our Rock Hill Hamfest. We need members that are going to attend the Shelby

Hamfest to help man the booth and sell admission tickets and raffle tickets. Let's show the rest of the local Ham Radio community, what a fantastic and active club we are. If you are going to Shelby, please sign up for an hour to help staff our booth, we cannot just have 6 or 10 people manning the booth the entire time.

York County ARES – November Exercise

The York County Amateur Radio Emergency Services group will be holding an exercise in November more details in upcoming ARES meetings.

Local Hamfest Updates:

The Shelby Amateur Radio Club will hold the Shelby Hamfest, September 3rd through the 5th, 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

New Hams and Upgrades

Congratulations to all those who successfully passed examinations during our test session on August 15, 2021

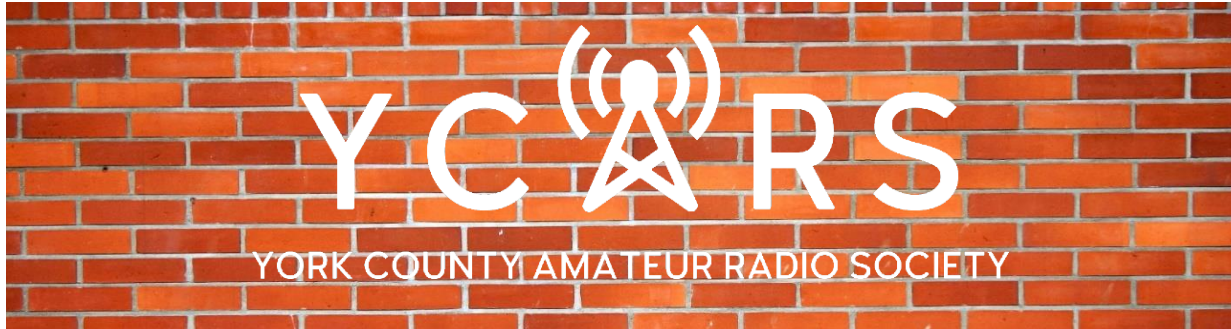
Welcome to Amateur Radio

Richard Lawson – Call Not Assigned

Congratulations on the Upgrade

KC2ODO/AG – John Sorrentino

KO4SRU/AE – Bill Poston



WALL OF ARROGANCE

Brent Case – K4BSC – Parks on the Air -Park to Park – 425

Wanda Case – KJ4JTH – Parks on the Air – Park to Park – 150

Vicki Carnes – W4NQX – Parks on the Air – Kilo award – Andrew Jackson SP

Vicki Carnes – W4NQX – Parks on the Air – Kilo Award – Worth Mountain WM

John Gendron – NJ4Z – Parks on the Air – Kilo Award – Oconee SP

K4YTZ – Parks on the Air – Kilo Award – Oconee SP

K4YTZ – Parks on the Air – Support Your Parks Plaque Event – Club Activation Champions

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 YCAR family please let us know.

The York County Amateur Radio Society

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