

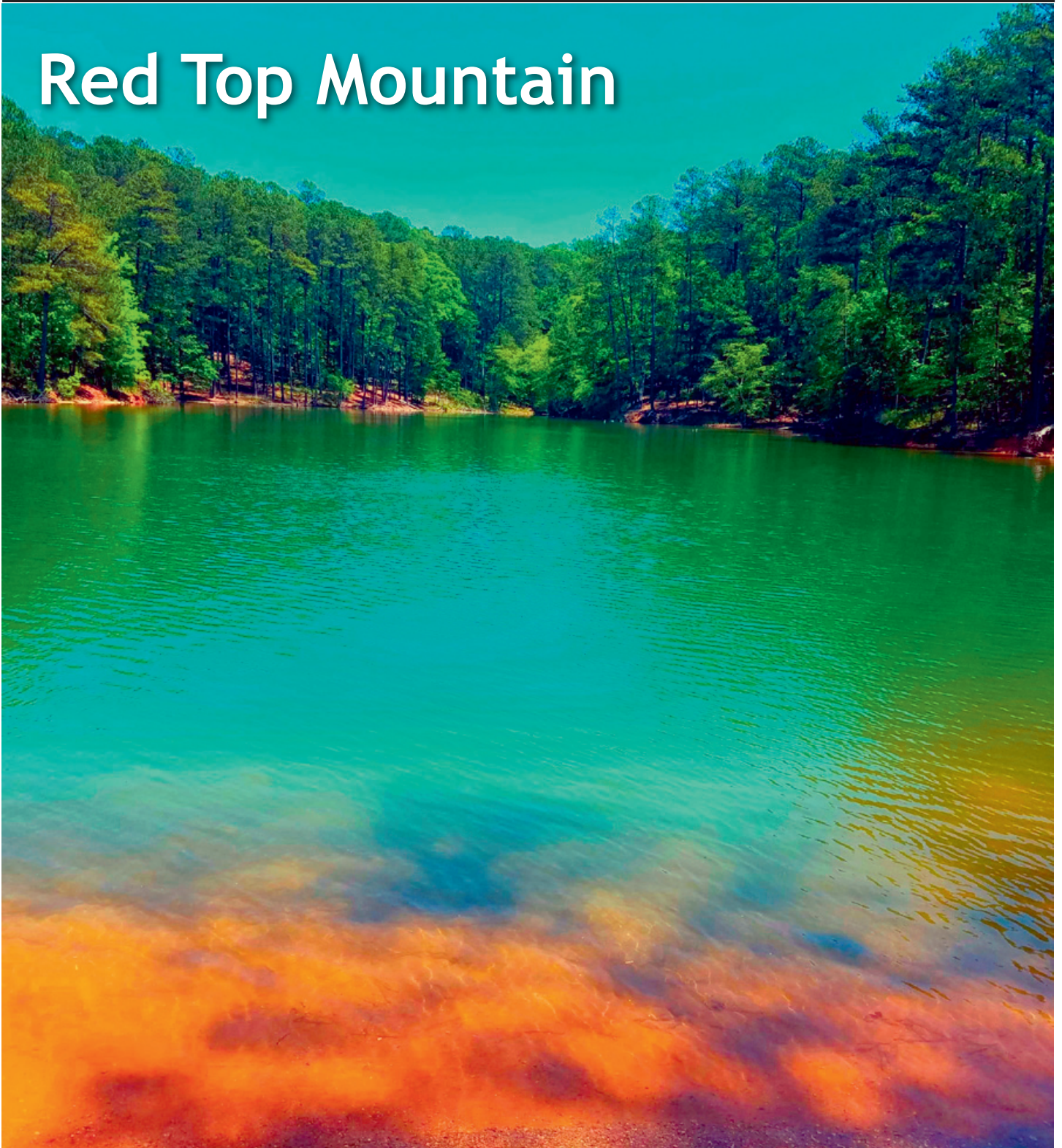
WX4CAR



Newsletter

February 2024 - Issue 6

Red Top Mountain





Message

from the President



At the January meeting I laid out the plan for club for 2024. We announced the theme for 2024 as “Ham Radio is a Contact Sport – Get Involved – Get Active”. In 2024 we want to have a number of opportunities for people to

do just that. If you are new to ham radio, or have mic fright, or just don't have the means to get on the air, these club events are made for you.

With Winter Field Day behind us, we look forward to spring and warmer weather. The first week of April (6th), the club will sponsor a POTA (Parks on the Air Event at Red Top Mountain. This is a perfect time to get on the air, earn some POTA points, and learn what can be done with remote operation.

What's the Point?

We also introduced the concept of a “point system” that will encourage people to be more active and participate in the growth of this club. We are getting a reputation around the Atlanta Metro area as the most friendly and active club. Let's keep that rolling in 2024! We will introduce the point system at the February meeting and let you know what activities qualify for points. We will tally these up at the end of the year and reveal who the most active members were in 2024. It should be fun.

New hams are vitally important to the club and to our sustained growth and vitality. Please be sure to treat our guests well, and help them to understand more about why you love ham radio. We will have a New Ham's Luncheon for the newcomers at the February meeting. We will have some “seasoned” members there to help and answer questions about the hobby. If you are a new ham (licensed less than two years) then you are invited to attend. It will be a simple gathering of new people who have questions and want to know what to do next.

Workshops are another way for people to learn. Hands-on is always better than any video or online article can ever be. In 2024 we are trying to organize a number of workshops that may appeal to different groups. However, at Field Day we will have at least one workshop activity to build skills and give you better appreciation for this great hobby. We will be talking more about that in the coming months.

Looking Ahead

Over the holidays I did some research on the biggest issues facing amateur radio. What I found did not surprise me much, but did raise my awareness of these as they relate to the CARS club. The top issues I found were:

- Declining participation in both clubs and on-air activities.
- Competition between technological advances that improve communications with other people and may decrease the need to radio and related direct methods.
- Spectrum scarcity. The government and private industry are thirsty for more spectrum.
- Less number of hams prepared for emergency communications that may be needed in a disaster.
- Low participation by youth.

I think you will see that the CARS club is attempting to fill some of these gaps with the activities and educational opportunities we provide. However, I am sure we can do even more. It just takes more involvement by you as a club member. Think about what you can do in 2024.

73,

Marty

KB4MG



Contesting

Contest Corner

February 2024

Vermont QSO Party

0000Z, Feb 3rd to 2400Z, Feb 4th

Minnesota QSO Party

1400Z-2400Z Feb 3rd

ARRL School Club Roundup

1300Z, Feb 12th to 2349Z, Feb 16th

CQ 160m Contest, SSB

2200Z, Feb 23rd to 2200Z, Feb 25th

North American QSO Party, RTTY

1800Z, Feb 24th to 0559Z, Feb 25th

DXpedition News

VK0AI Casey Station Antarctica

February 2024



VK0AW Davis Base Antarctica

Thru Feb 13th



8R7X Guyana

Feb 14th - Feb 23rd





GEAR

by Dave Jensen – W7DGJ

Summer isn't necessarily "antenna time" in Arizona. But, as any ham knows, it doesn't matter whether it's snow in Michigan or 110 degrees in the sun if you've got an antenna issue. When that homebrew dipole wasn't doing the job any longer, I decided to just buy something and get it up quickly. I hate to admit it publicly, but sometimes my need to get on the air is far stronger than my pleasure in fabricating antennas. While the old dipole was fine for my "100 Watts and a Wire" station, when operating at legal limit there would be some serious reconfiguring necessary.

A tower isn't in the cards because of my promise to my XYL that I would keep all my antennas "mounted on natural objects," and as camouflaged as possible. Picture an antenna mast springing out of a prickly shrub that stands no more than four feet high, and that will give you some idea of what I am up against in my piece of heaven here in the desert. All of our trees are extremely prickly and not the kind you see kids climbing in the summer. So, I engaged a local handyman to assist me with this installation. That's when I learned that you need to watch closely when even the handiest of the handymen are engaged in ham radio projects.

After doing the research, I had decided to buy an antenna that is built for a setup like mine, the Buckmaster (sold through both DX Engineering and Ham Radio Outlet). This antenna offers a 3000-watt rating with minimal height requirements ... 32 feet in the center and 10 feet on the ends. When it arrived, I was happy to see that it was built like something for the military. The center balun was very heavy duty (and physically heavy as well), and the 135' of wire and remaining components looked equally brawny. I swallowed my pride and contacted my handyman friend Gabriel, who has helped me with many household projects.

We had secured both ends of my new antenna (135 feet long) to their respective positions on



Juniper trees at the required 10' mark and installed a middle post which had now stabilized in its pad at 32'. I handed Gabriel a bottle of bright green Liquid Electrical Tape and described how I wanted to protect the coax connection under the Buckmaster's balun. I went about digging a trench, confident that my handy friend would be fine at the top of his ladder with the sole job of getting a good waterproof seal on the PL-259.

A few minutes later, I looked back and saw that Gabriel had unscrewed the PL-259 connection and was holding my \$200 run of coax in his hands while he painted the LMR-400 termination, inside and out, with bright green liquid tape. I could have soldered on three new PL-259's in the time it took me to clean out that green gunk from inside the formerly shiny new connector. From that moment on, I now handle all electrical elements of my antennas.



I'm enjoying the Buckmaster a great deal, but have since found another OCF (built just as well) produced by Palomar Engineers that could have saved me some significant coin. And for you antenna gurus, yes I know that OCF's often produce problems in the shack due to common mode. After playing with both the Buckmaster and the Palomar to reduce those issues, I wouldn't trade them for anything. 73 for now, Dave W7DGJ



Dave Jensen, W7DGJ, was first licensed in 1966 as WN7VDY (and later WA7VDY). Dave loved radio so much he went off to study broadcasting and came out with a BS in Communications from Ohio University. After working his way through the microphone business of Audio-Technica, he moved to Arizona and was later re-licensed as W7DGJ

*(Scottsdale). His column, **Tooling Up**, ran for more than 20 years in the website of the leading scientific journal, SCIENCE, and his column **Trials and Errors: Ham Life with an Amateur** continues to be a popular read each month on QRZ.com.*

Read Dave's column at <https://www.qrz.com/trials-and-errors>

Editor



Reports of Ham Radio's Death Are Greatly Exaggerated

Ham radio is dying. You've probably heard that, maybe even believed it. The data don't lie. Figures collected by the American Radio Relay League (ARRL) list about 755,000 U.S. licenses in place as of the end of 2023, up from 663,000 in 2008. While that may look like a healthy increase, it represents an annual growth rate of less than 1 percent. ARRL cites a number of reasons including the massive popularity of cell phones and the internet that compete for our attention. Moreover, amateur radio is seen as a hobby that primarily attracts older fans. The FCC no longer collects demographic information on licensees, but anecdotal evidence is clear.

Hope, however, is far from lost. Some forward-looking hams have seen success generating interest among the younger set. In December, students at a high school in Harbor Creek, Pennsylvania, participated in a program to communicate with astronauts aboard the International Space Station. In preparation for that event, 16 students tested for their license, including three who earned Extra-class privileges. Our own club member, **Cassandra Zielinski, KQ4JVI**, was inspired to bring that same experience to her students at Mountain View Elementary in Cobb County.

"They are fascinated with speaking to others and tracking satellites when there is no Wi-Fi or Bluetooth," she said. "They still have a hard time believing [they can speak to the astronauts] and they grow more excited about it every day." Mountain View students look forward to their space QSO later this year.



A Helping Hand

CARS president **Martin Buehring, KB4MG**, concurs that just getting a youngster on the air can create a lifetime connection – with a little help.

"If you are a new ham, you especially need help getting started," he said. "It's one thing to listen to a podcast or watch a YouTube video, but it is quite another to have an experienced person sit by your side and show you."

Several prospective new hams have had their first taste of the hobby at CARS-sponsored Field Day events. CARS has bucked the slow-growth trend, expanding membership from about 25 a few years ago to more than 130 today. Buehring says the club finds new members by offering monthly ARRL testing sessions and through its website. Last year, the club tested 58 applicants with 18 new Technician, 21 General and 10 Extra-class licenses issued.

"People seeking out amateur radio are already 'interested.' The real question is how to grow that interest," he said. Club activities including technical topics at monthly meetings and workshops for radio related projects help cement that interest.

ARRL Weighs In

On the national level, ARRL is expanding its outreach both to teachers and students by working with organizations like Scouts, 4-H and the Collegiate Amateur Radio Program.

"We are developing licensing materials and video courses taught by youth, focused on youth," said **Steve Goodgame, K5ATA**, education and learning manager at ARRL. "We are also building courses on the ARRL Learning Center that are of high interest to youth, including things like 3D printing for ham radio."



That's the kind of content that encouraged 12-year old **Frankie Liput, M7EQR**, to earn his license in the UK last summer. "I was attracted to ham radio by the fact that it is a technical hobby. I think some older hams don't quite understand what kids are like nowadays."

Buehring remains optimistic that radio's future is bright.

"The argument about the hobby dying has been around for many years," he said. "New hams bring an excitement and expectancy that is contagious."

Lee Hall, K4QO

ARRL Programs to Encourage Growth of Amateur Radio

- Working with Scouts, 4-H and other youth organizations
- New license material, video courses taught by youth
- Courses on new technology such as 3-D printing via ham radio
- Supporting ARISS (Amateur Radio on the International Space Station)

Number of U.S. licensed amateur radio operators

YEAR TOTAL LICENSES ANNUAL GROWTH RATE

2005	661,272	
2015	733,594	1%
2023	755,109	0.37%

**HAM
RADIO** 
IT'S A CONTACT SPORT

**GET INVOLVED
GET ACTIVE**

Expert



Ask An Expert

Ask an Expert is a column we have begun where club members can ask questions that may require some expertise and research to answer. We hope this column will be helpful and educational for everyone.

In January we received a lengthy but thoughtful question from **John Hearn (KZ4AX)**. I have reworded the question for length while trying keep the main idea.

Question

Resource material (books, articles, online sites) seems to depict frequencies (electromagnetic waves) in a 2 dimensional way. I do not understand how these can be flat. Are they not circular and move circularly?

How are these different than sound waves or ocean waves? They are thought to be three-dimensional and have X,Y,Z components.

This is one of those things that I got to thinking about when I played with a Slinky in the store, at 64 years old. The Slinky, when viewed from the side goes through positive and negative phases, but when looked at it lengthwise it is also circular through it phases. So, I thought about frequencies (light, sound, radio). And then, I thought about ocean waves. Being an old surfer (longboard only), ocean waves also have positive and negative phases.

So, are radio frequencies just existing in two dimensions, or do they exist in the X-Y-Z?

Answer

Thank you for your thoughtful question, John. Most people don't even give any thought to this topic. We take many things for granted and just assume they work because they work.

You asked about how radio waves are the same or different from other waves. Well, in a word, they are very different. Sound waves require a "medium" by which to travel. We are most familiar with them traveling through air. Air is a gaseous mixture that is mostly nitrogen and oxygen and sound can travel

through air by compressing the gas. If you listen underwater in the ocean, you may hear whale or porpoise noises being transmitted through the water, which is another medium. Steel and other metals are very good conductors of sound waves. However, in the vacuum of space, there is no sound. Radio waves on the other hand, travel nicely through the vacuum of space.

It turns out that physicists and mathematicians have worked on the behavior of electromagnetic waves (EM waves) for 2+ centuries. It was electromagnetism that was first observed by Hans Ørsted in 1820. He discovered that an electric current in a wire could deflect a magnetic needle nearby. This discovery demonstrated a connection between electricity and magnetism, laying the foundation for the study of electromagnetism.

In 1864 James Clark Maxwell developed the mathematics of electromagnetics and the behavior between the electric and magnetic fields. I have always found that amazing. These equations are the basis for designing things like antennas. It is real high-level math and requires calculus to understand. Heinrich Hertz (yes we named frequency after him) confirmed Maxwell's equations through experiments.

Later, Guglielmo Marconi successfully applied the principles of electromagnetics to transmit the first radio signals in his quest to develop the wireless telegraph. In 1901 he made a successful transatlantic transmission and the rest is history.

With that background, electromagnetic waves are made of two fields, one electric and the other magnetic, pulsing at 90 degrees from each other (x,y component) and travel in the z direction with a length determined by the frequency. See Figure 1. We generally talk about these waves in both frequency and wavelength. The z dimension is the wavelength. These travel at the speed of light in free space.

We can only theorize about how EMwaves look. We can measure them, see their effects, and even know how to steer them, but we can't see them. You asked

about if they are circular. Because we can't see them we can only guess based on behavior. You are familiar with the term "polarization". You see this is action with VHF/UHF radios and repeaters. These are all vertically polarized because vertical antennas are the reasonable way for handi-talkies (HT's) and mobile radios to orient their antennas. When EMwaves travel short distances, like line of sight, they keep their polarization, as there is nothing to interfere with it. However, if EMwaves encounter the ionosphere, as do HF signals, the reflection and refraction will twist the polarization. This is why both horizontal and vertical antennas work in the HF band. So, yes, they can and do twist.

It also turns out that physicists have different "models" for EMwaves depending on the application and analysis they are trying to do. Engineers tend to work with EMwaves as vectors. This works best for the mathematics. SimNEC and similar programs can show near-field patterns that give you an idea what the antenna is doing. These diagrams are based on vectors (which have magnitude and direction). Figure 2 shows the radiation plot for a dipole antenna. This is 3 dimensional behavior.

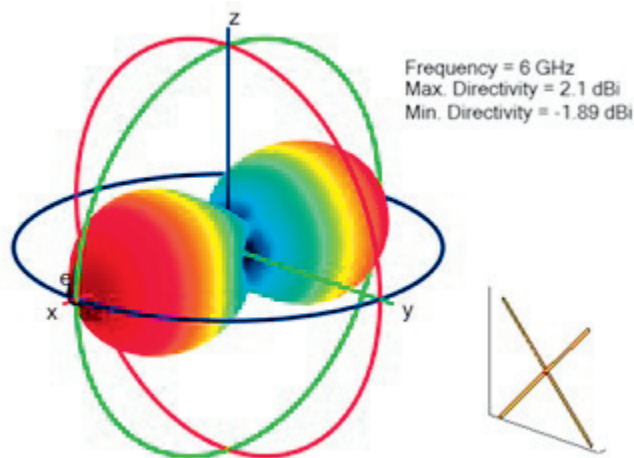


Figure 2 Antenna Pattern for dipole

Light is an EMwave and is part of the electromagnetic spectrum as well. So, does that mean our eyes are antennas? Well, sort of because we do receive light of certain frequencies and convert them to electrical signals our brain can process. Working with light, scientists like to think of light as a particle called a photon. When these "photons" strike a photosensitive surface they cause a reaction to occur. Think photography, but also CCD imaging devices. We engineer these products and applications by treating light as a particle. This is just another rabbit hole I won't go down, but thought I would throw that in for additional knowledge.

In summary, your questioning about EMwaves is normal and inquisitive. This is what ham radio is about; it prompts us to ask questions about how this technology works and how we can master it. I hope this answer makes sense to you and can give you an appreciation of how complex EMwaves can be. By using best practices, hams can work with RF (EMwaves) and mostly get them to behave.

Electromagnetic Wave

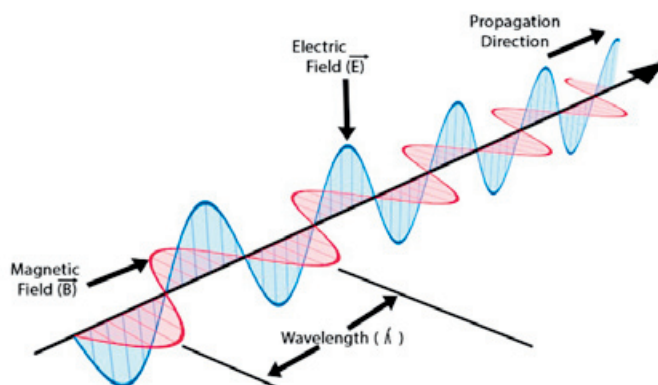


Figure 3 Electromagnetic Wave

Resources



WX4CAR Resource Links

Website - <https://www.wx4car.org>

Contact Us - <https://www.wx4car.org/contact-us.html>

Membership - <https://www.wx4car.org/membership-form.html>

CARS Club Technical Programs - <https://www.wx4car.org/technical-monthly-programs.html>

Club Activities - <https://www.wx4car.org/club-activities.html>

POTA Corner - <https://www.wx4car.org/pota-corner.html>

ARRL FIELD DAY - <https://www.wx4car.org/field-day.html>

Ham Fests - <https://www.wx4car.org/amateur-radio-events.html>

CARS Groups.io - <https://groups.io/groups>

ARRL Testing Info - <https://www.wx4car.org/testing2023.html>

New Ham Kit - https://www.wx4car.org/uploads/8/3/7/7/83773582/wx4cars_intro_to_new_hams-7apr2021.pdf

Ham License Upgrading - <https://www.wx4car.org/obtaining-a-license.html>

Technician Ham Cram Study Guide - https://www.wx4car.org/uploads/8/3/7/7/83773582/2022-2026_technician_pool_study_guide.pdf

Club Apparel - <https://www.hamthreads.com>

CARS Club Badges - <https://www.thesignman.com/clubs/carsga.html>

POTA Supplies - <https://www.clubgearonline.com>

Contesting Links

ARRL Contest Calendar - <http://www.arrl.org/contest-calendar>

Contesting Calendar - <http://www.contesting.com/>

CQ Contest Calendar - http://cq-amateur-radio.com/cq_contests/cq_annual_contest_calendar/cq_annual_contest_calendar.html

SolarHam Site - <http://www.solarham.net/index.htm>

Space Weather - <http://www.spaceweatherwoman.com/>

Contest Calendar - <https://www.contestcalendar.com>

Other Links

ARRL - <http://www.arrl.org>

Sky Warn - <http://skywarn.org>

QSO Today - <http://qsotoday.com>

Cherokee EMA - <http://cherokeega-ema.org>

Georgia ARES - <https://www.gaares.org>

Ham Radio Work Bench - <http://hamradioworkbench.com>

On All Bands - <https://www.onallbands.com>



WX4CAR

CARS Officers for 2024:

President:

Martin Buehring – KB4MG

Vice President:

Chad Cone – KY4KP

Secretary:

Mark Schulze – KO4IFY

Treasurer:

James James – KE4HMS

Cherokee County

Emergency Coordinator:

Rob Bruderer – W1JKU

Email–club.wx4car@gmail.com

Time & Location of Meetings:

Meetings are the second Saturday of each month at 10:00 am Eastern Time.

*William G. Long Senior Center
223 Arnold Mill Road*

Woodstock, Georgia 30188

Our meetings are open to all visitors. You do not need to be a member or have a license to attend. Come for the fellowship and technical programs.

We also have a combined ARES meeting at the same time. ARRL FCC Testing is at 1:00PM following the meeting.

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**GET INVOLVED
GET ACTIVE**

Mission Statement

The mission of the Cherokee Amateur Radio Society is to promote the hobby of amateur radio to the Cherokee County residents and surrounding communities. It primarily serves to provide education, FCC testing, public service, and fellowship to people with the common interest of amateur radio.

Cherokee Amateur Radio Society is an organization of FCC licensed amateur radio operators (also called Hams) that meet and share the hobby, educate people about amateur radio, as well as support our local community in times of disaster. We are located in Cherokee County, Georgia and have club call sign **WX4CAR**. We are an ARRL Affiliated Club.

The club also participates with ARES, and the Cherokee County EOC when severe weather gets close to the area, and we help with local public service projects. The members of the club also dedicate some of their time to promote and help new hams to develop their skills and knowledge on Amateur communications modes and to be better operators. We are a very active club and participate in ARRL Field Day every year. If you are located in Cherokee County or the surrounding area, we would like to invite you to participate.