

Nacogdoches Amateur Radio Club

2013 CLUB OFFICERS

Pres: Mike Brown - KF5KEY

VP: John Cechin - W5FWR

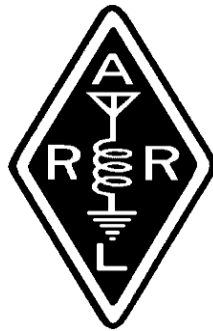
Sec/Treas: Army Curtis - AE5P

Visit our web site at

<http://w5nac.com/>

MISSION STATEMENT

The Mission of the Nacogdoches Amateur Radio Club is to support and promote Amateur Radio by public service, offering training to unlicensed interested parties and licensed Amateurs, mutual support of other Amateurs, engaging events that promote Amateur radio to the general public and other Amateur radio operators, and continuing fellowship by regularly scheduled organized meetings and events.



JULY MINUTES

The July meeting of the Nacogdoches Amateur Radio Club (NARC) was held as scheduled on July 3rd. **Vice President John W5FWR**, opened the meeting at 7:00 p.m. in the Parish Hall of Christ Episcopal Church. Fifteen members and five guests were present. Each person present introduced themselves. Minutes of the previous meeting were approved as corrected. The Treasurer's report was estimated.

Army AE5P and **Bill N5YA** gave reports on their respective Field Day operations.

Marshall K5QE reported on the June VHF Contest. K5QE entered as a Limited Multi for this contest, and Marshall reported they scored about 415K points.

Marshall K5QE reported their next 6 meter grid expedition will be to EL84 a little north-west of Key West Florida. They will be operating from a chartered fishing boat with a crew of seven.

Meeting adjourned at 7:23 p.m.

Show and Tell: Jim WA5GVQ showed off his freshly restored Drake T-4XC by WD5HFN. Very nicely done.

Program: The first annual NARC Ice Cream Social was held, along with a birthday celebration for

Dr. Tom W5TV. Lots of ice cream, but special note has to be made of the home made peach ice cream brought by Bob and Virginia Knibb. Wow!

FROM THE PRESIDENT

It seems like the time to write a newsletter grows shorter and shorter each month. I have come to the conclusion that I would have made a very poor living as a writer. This last month has involved me in quite a number of things, but none of them have to do with ham radio.

Let's see...at the last VE session, we had quite a crowd of applicants taking tests. I can't ever remember having seen so many people taking tests at one time. In addition, I think that everyone passed the exam he/she was taking. So congratulations to all the new hams and to all those who upgraded their licenses. It's great to have new blood in the ham world.

Oh, and Army, AE5P, has finally gotten his new Flex Radio 6700. It took over a year to finally get that rig, and I feel that he showed a great deal of patience. It seemed like every other week or so he was getting the message, "We're just about to ship the new 6000 series!" and then another month or two would pass. When we talked to the Flex representatives at the Ham-Com in Plano, they assured him that they were "just about to ship." Well finally, the check was really in the mail and he received this new electronic wonder. I hear that it is so advanced that it now has Army's permission to use the car at night....You may read "envy" here.

And as fate would have it, I was under the weather for the last meeting and missed the First Annual Nacogdoches Amateur Radio Ice Cream Social. It was my understanding that a great time was had by all. I'm sure that you fine folks

have put back a tub or two of ice cream in the freezer for those pitiful few who weren't able to attend. I am nothing if not subtle....

If you aren't tuning in to the NARC ARES/RACES net on 146.84 on Monday nights at 8:00 PM and the SKYWARN net on 147.32 on Thursday nights at 8:00, then you are missing an opportunity to talk with some fine folks as well as utilize the 2 meter band. It seems like there is very little going on there, and here is the chance to utilize some of that neglected ham gear that's just sitting around the shack. Please give us a shout...we'd love to have you.

I was contesting on the HF bands this past Saturday, and I really had a blast. Made a great number of US contacts, and then began to work 15 and 20 meters. There was Havana, Cuba, Honduras, Bradbury, Australia, Mexico City, Mexico, Medellin, Columbia, and many others on the log in

just a few minutes. The bands were really cooperating. Amazing what you can do with 100 watts and a wire....

Well, as I said, I really have had little time to devote to radio this past month, so I'll make this one short. I'll spare you my usual bucketmouth dribble. Hope to see you all Wednesday, August 7th for the monthly meeting.

73 to all....

KF5KEY - Mike

Email:

michaelleebrown@hotmail.com

MY 2 CENTS FOX WILLY ROGER

July, slackers just a bunch of slackers that's what I call it. A great July program was planned toiled over and scheduled not to mention the many members that contributed to the program and you don't even bother to show up, not even a RSVP, slackers. The July program was a great success, in spite of the slackers. The

July Ice Cream Social is now an annual event and those who did not attend will not; I repeat will not get a **gold star** besides their names in the attendance book. Having said that the few, the cream as it were, had a time that was great, not only was the ice cream sweet and good, but the fellowship was of the best there was to be had. July is the un-official start of the hot season, with that in mind it was felt appropriate time to have this event, the bulk of the fun parts, JANUARY & JUNE VHF contests, the double J's, SES, FIELD DAY, RIVER RUN and HAMCOM just to mention a few. Of course the club still has four big events to go, ELECTION OF 2014 OFFICERS IN NOVEMBER, SEPTEMBER VHF CONTEST, AUSTIN'S SUMMERFEST and the XMAS PARTY AND WHITE ELEPHANT SALE. I don't know about you but July seems to be in the middle of a hams event calendar, another good reason for the ICE CREAM SOCIAL.

A trip to the back yard shows the word tree feeling the heat of summer and little was produced this last month.

Well now **AE5P** has had his new toy for a bit now and he reported that he made contact on 75m with his neighbor a half mile away, see what a lot of money and many years of being a HAM can achieve, I hope to be one of those one day. Now all the parts fall in to place, AE5P is going to Austin Summerfest to talk to Flex Radio people, everything is clear now, maybe Army can shed some light on his new SDR when he gets back from Austin perhaps in September?

Speaking of programs, K5QE is in the books for August; Marshall is going to tell us all what goes into building a first class VHF contest station and maybe some on his DX trip. As always K5QE will be happy to have an open Q&A time.

So come one come all and learn, our club members

have so much knowledge accumulated that all you have to do is ask, that's what this hobby is all about, sharing. By the way, any volunteers for October and or the November meetings? You all know that when you give a program that it makes you feel good to pass on some of the information that you have, you know that it will enrich other lives.

I believe it is time to give someone else the soap box, I know that's what I said last time, but it still holds true.

Remember: keep your powder dry and your head below the horizon.

Happy Trails

73 Enjoy

What do you think, let me know?

73,
John Cechin W5FWR

Carrots4ever2u@suddenlink.net

CONGRATULATIONS

To **Ralph WD5RAH**, on his upgrade to Extra.

VE TESTING

Our next VE testing is scheduled for Wednesday, August 21st at 7:00 p.m. in the Parish Hall of Christ Episcopal Church. Applicants should bring a picture ID, the original and a copy of their current Amateur license, the original of any CSCE's and \$15 to cover the cost of the exam(s). Correct change is always very much appreciated. 73 de AE5P
email: ae5p@arrl.net

CLUB NETS

Remember to join us each week for the 2-meter nets sponsored by NARC. Each **MONDAY** is the

NARC ARES/RACES net, at 8:00 p.m. on the club's 146.84 repeater (PL 141.3). Second, on **THURSDAY** evenings at 8:00 p.m. is the **Deep East Texas Skywarn Emergency Weather Net** on the 147.32 repeater (PL 141.3). Please join us for one or both. We are always looking for folks who would like to become net control operators. If you are interested, please contact any of the existing net controls. We will be pleased to help you in any way we can.

NEXT MEETING

The next meeting will be on **Wednesday August 7th** at 7:00 p.m. in the Parish Hall of Christ Episcopal Church. The church is at the corner of Starr and Mound Streets in Nacogdoches. Please come join us and bring a friend.

BASIC SIGNAL PROPAGATION

PART 4

by

Thomas Atchison W5TV

Previously we discussed ground wave propagation. This propagation refers to radio waves that travel in the Earth's lower atmosphere. We would now like to talk about those radio waves that leave the Earth's lower atmosphere and use the Earth's ionosphere for their propagation. These radio waves are commonly referred to as **sky waves**.

First, we need to realize that radiation from the Sun provides the primary ionizing agent for Earth. The Sun emits a varying intensity of ultraviolet radiation and X-ray radiation which are the primary ionizing agents in solar energy. The upper part of the Earth's atmosphere is called the ionosphere. This is a region where the air pressure is so low that free electrons and ions can move about without getting close enough to recombine into neutral atoms. A radio wave entering this region is affected in the same way as a radio wave entering a medium of different dielectric constant. That is, the direction of travel of the radio wave is altered.

Ultraviolet (UV) radiation from the Sun is the primary cause of ionization in the outer regions of the atmosphere; however, there are other types of radiation such as X-rays, gamma rays, and extreme ultraviolet radiation (EUV). This radiated energy breaks up, or photoionizes, molecules of atmospheric gases into electrons and positively charged ions. Physically, this ionization occurs in several relatively dense regions or layers that are approximately parallel to the Earth's surface and anywhere from about 25 miles to over 300 miles above the Earth. Ionization in these layers is usually at a maximum at the center of a layer and it tapers off as you move to the outer edges. Also, the height and the intensity of the ionization varies depending on the time of day, the season of the year, the distance between the Earth and the Sun, and variations in solar activity.

The lowest known ionization layer is called the D layer. It occurs between about 37 and 57 miles above the Earth. The atoms in this layer are broken up by sunlight. Because of the density of atmospheric molecules at this altitude they quickly recombine. This means that the ionization in the D layer is dependent on sunlight. It begins at sunrise, peaks at about midday and disappears at sundown. Radio waves passing through the D layer cause electrons to move and the motion creates collisions between particles that are so frequent that a major portion of their energy is used up as heat. That means that a major portion of the wave energy is absorbed by the D layer. The probability of collisions depends on the distance an electron travels under the influence of the radio wave; therefore, the wavelength becomes important. Since the 1.8 MHz and 3.5 MHz bands have the longest wavelengths, radio waves on these

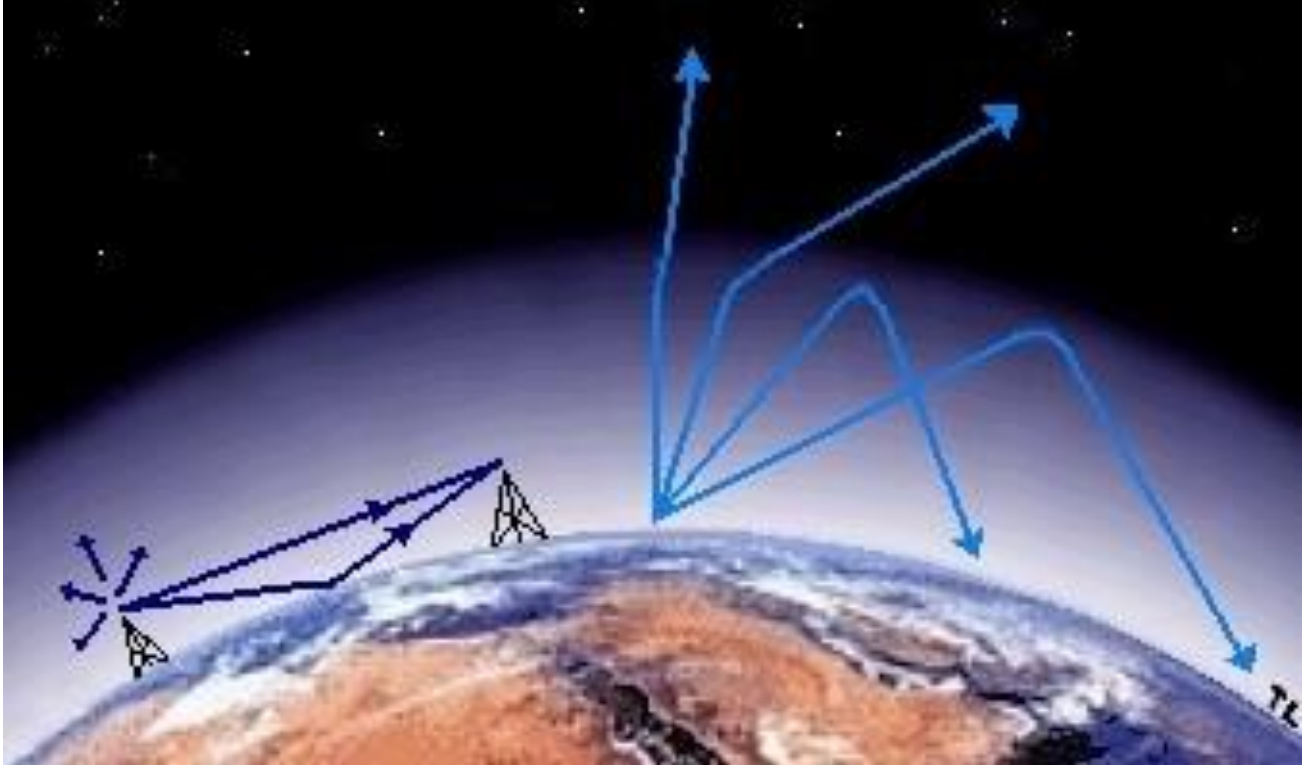
bands suffer the highest daytime absorption loss. Because of this absorption loss, these bands seem to 'go dead' during daylight hours. This absorption is less at 7 MHz and very slight at 14 MHz. The D layer is ineffective in bending HF waves back to Earth; therefore, its role in long-distance communication by amateurs is largely a negative one.

The next ionization layer is called the E layer. It occurs between about 62 and 71 miles above the Earth. In this layer ionization varies with the Sun angle above the horizon, but solar ultraviolet radiation is not the only ionizing agent. Solar X-rays and meteors entering this portion of the Earth's atmosphere play a part in the ionization of the E layer. Just as the D layer, the E layer absorbs wave energy in the lower frequency amateur bands but, because the density of molecules is less, the absorption is not as great.

The next ionization layer is called the F layer. It occurs between about 100 and over 300 miles above the Earth. At heights above 100 miles, ions and electrons recombine more slowly, so the observable effects of the Sun develop more slowly. The F layer has the ability to reflect radio wave energy back toward the Earth. This F layer is not simple. Its density depends on the season of the year, the latitudes, the time of day, and, most of all, what the Sun has been doing over the past several hours or days. During the day the F layer may split into two layers. The lower and weaker layer is called the F_1 layer and it occurs at about 100 miles above the Earth. The higher and stronger layer is called the F_2 layer. At night the F_1 layer usually disappears and the F_2 layer drops in height.

The degree of bending of a wave path in an ionized layer depends on the density of the ionization and the length of the wave (inversely related to its frequency). The bending at any given frequency will increase with increased ionization density. For a given ionization density, the bending decreases with frequency. This means that there are two extremes. If the density of the ionization is sufficient and the frequency is low enough, even a wave entering the layer perpendicularly will be reflected back to Earth. Conversely, if the frequency is high enough or the ionization decreases to a low enough density, then the wave will not bend enough to return to the Earth's surface. That is, the radio wave will go out into space. Most of the time, the effects of ionization are somewhere between these two extremes.

Now consider the elevation radiation pattern of a particular antenna. We consider the various lobes of the pattern and the angle they make with the Earth. If we have a major lobe that has a low angle of radiation from our antenna then that wave will not need much bending by the ionization layer to be able to return to the Earth. As the angle of radiation increases, the more the wave must be bent to be able to return to Earth. The density of the ionization layer determines the amount of bending at a particular frequency, therefore, we can see that there should be a particular angle such that the transmitted wave will return to Earth, but any higher angle will allow the wave to escape into space. Such an angle is called the **critical angle** of radiation. That is, the critical angle of radiation is the highest angle of radiation from our antenna that will allow the transmitted wave to return to Earth.



In the above diagram we can see a representation of a ground wave on the left and a representation of sky waves in blue on the right. Notice that the high angle waves are not returned to Earth; however, the lower angle waves do return to Earth and can be used for communication purposes.