January 2010 **Volume 01-2010**

Nacogdoches Amateur Radio Club

2010 CLUB OFFICERS

Pres: Rusty Sanders – KD5GEN

VP: John Jordan – N5AIU

Sec/Treas: Army Curtis - AE5P

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.

JANUARY MINUTES

The January meeting of the Nacogdoches Amateur Radio Club (NARC) was held as scheduled on January 6th. **President Rusty, KD5GEN**, opened the meeting at 7:00 p.m. in the Parish Hall of Christ Episcopal Church. Each person present introduced himself. Minutes of the previous meeting were approved as published. The Treasurer's report was read.

Unfinished Business:

The antenna still needs to be installed at the Nacogdoches Recreation Center.

The Telpac Node needs some work at the Fredonia Hotel.

New Business:

President Rusty – KD5GEN, made a short speech. He views his position as a facilitator rather than a leader. Talked about things the club can do. Maybe as a group go to Belton, etc.

Vice President John – N5AIU, asked for volunteers for programs etc, or input on topics.

John – N5AIU, reported that there is now no amateur radio class at the McMichael Middle School.

Our **EC, Ronnie - KE5LWV**, asked that we make sure and get the number of net participants

posted to hamlist so he can tally it for his report.

Discussion of the telpac node at the Fredonia. Was indicated that this was removed for repair. **Mark - W5TXR** indicated that he can get permission for this to go on the Bergman tower near Central Heights. Rusty told him to contact Army and discuss it.

Rusty indicated that the club needs a PIO. Asked for volunteers and since there were no volunteers, please think about it and it would be discussed at the next meeting.

Rusty said that it is time for the shuttle special event station. Do we want to have it and most wanted it. **John N5AIU** said the school is reserved for it. **John and Rusty** will coordinate efforts for this. It is scheduled for the date of Feb 6 with IHOP at 7, antenna raising at 8 and kickoff at 9. **John KC5MIB** will contact his friend at ARRL and see if we can still get the word out about the event. It will be 2 HF stations and a 2 meter station set up. **Rusty** will furnish one radio and will use the school's radios. School antenna will be used along with the butternut antenna. **John KC5MIB** will furnish a computer along with **John N5AIU's** computer. Pizza will be ordered. **John and Rusty** will coordinate the drinks.

Discussion of Belton in April. **Rusty** threw out the idea of possibly a group attending and if there was enough the possibility of the club renting a van. Discussion of motels was had.

Field day will be June 26 and 27. Preliminary field day committee will be **W5TXR** and **KE5ZNJ** with others appointed next meeting. They will determine site which will probably be the airport and will use the city trailer.

Robert KD5FEE mentioned the Geospatial center is no longer downtown but is located on the top floor of the College of Education building. They have mentioned that they would like a radio station located there. The Dean has agreed to having an antenna on top of the building.

KD5FEE and **W5TXR** both have a set of telpac nodes. **KD5FEE** has some computer problems with his at the current time.

K5QE said the VHF contact will be on Jan. 23-24. Asked for rover volunteers.

Mention of the N. A. QSO party on 16 and 17.

Meeting adjourned at 7:34.

Program was a presentation of the hamexpedition that **K5QE** made to south Louisiana in May.

Oscillations From The Chair

I must say that I am certainly glad the first meeting of the year is history. I was quite nervous behind the gavel

and not having our esteemed Secretary/Treasurer there for guidance.

In preparation for the Columbia Special Event station on Feb. 6, I realized that we must get the word out to all the hams in Texas and Louisiana who assisted in some form or fashion in 2003. To notify them of the event and to invite them to participate either in person or over the air, I drafted a little info letter. Army, AE5P, helped in correcting some brain fizzes that I had and I was able to mail this to all the clubs in NTX, STX, and that state to our east.

You may remember way back when for many of us, the English or literature teacher may have made you compose an essay on the adage that "No Man Is An Island". I have now developed a different take on that and I must say, "No club is an island". Since I sent this info letter out, I have had replies from the Northern Ohio DX Association, M5AKA in England, KD8DEG in Michigan, and KE7FEG in Scottsdale, AZ. I was amazed at the coverage that we are getting on this special event station. There will be people out there listening for the call sign W5NAC – Nacogdoches on Feb. 6. I sure hope we have some great conditions on that day and can make contacts with many of these stations. One club interfacing with other clubs spreads the word not only as a memorial and remembrance of the shuttle event but puts our area out on center stage to the world.

On another note, I was monitoring the SATURN frequency of 14.265 a day after the quake in Haiti. Messages had been sent out from numerous sources regarding the special emergency frequencies that were being used and asking hams across the world to make sure and use diligence in avoiding operating near the frequencies. I was really surprised that some ham operators knowing still operated their nets close enough to the emergency frequency that interference was caused. I cannot imagine that not one of those operators did not get the message and get their group to move away from their normal net frequency. I never actually heard any emergency transmissions come from Haiti to the net but had someone tried to call, the nearby group could have cause issues with the traffic.

Once again, I am trying to re-learn the code and build my speed up so I can actually get 'on the air'. I happened to find a real neat site or what appears to be a neat site if my 'puter' would quit shutting down when I am opening the program. I think it may have something to do with System 7. The site is http://lcwo.net . This stands for "Learn CW Online". From what I gather, you register for free and as you receive the code, you type in the character. You can set the speed and what characters you want. For

now, I will stick with the other program I have downloaded.

We have the Columbia event coming up along with field day. Anyone wanting to volunteer for some activity during these events, do not be shy, step forward and participate. The pay is not so good but the experience is priceless.

Finally…
From the ARRL, this tidbit of ham history. "The Q Code came into being internationally in 1912 to overcome the language problems involved in communications by radio among ships and shore stations of all countries. The original list of 50 adopted by international agreement in London contain many which are still familiar to amateur operators-QRN, QRM, QSO, the traffic operator's QRK, QSY and QRV - are now nearing the century mark of continuous usage. QSL still has the official 1912 definition despite the changed informal usages it is subjected to in amateur parlance."
I hope to see all of you at the next meeting, Wednesday, February 3.

73 until next month.
KD5GEN- Rusty

email:
rusty.sanders@att.net

VP's CORNER

The program for January presented by Marshall, K5QE, was really great. It certainly demonstrated what hams are willing to go through to get a grid on the air. Kudos to Marshall and his group for this effort. Our February program will be presented by Army AE5P. It will be on the subject of software defined radio. I know this will be interesting to all. Don't miss it.

This past weekend was the January VHF contest. We had three rover groups that went out together. We ran a total of ten grids over the weekend. Propagation was really bad during the contest and contacts were few. Army (AE5P) and Jonathan (KE5PQI) took out the white rover. Lon (AE5BN) and I (N5AIU) were in the red rover. Bill (WSKF) took his car solo. Despite the lack of contacts we had a good time and enjoyed good fellowship.

In the red rover, we had some upgrades since the previous times out. Lon and I had both purchase a set of Heil Headsets. No more tangling up the mic cords from the two radios and getting confused on which radio you were actually transmitting. We could monitor both radios at the same time. All we had to do was flip a switch to which radio we were going to transmit, which operator was going to transmit, and either use a footswitch or press a button to transmit. This worked great and was super cool. Kudos to Army for building this for us. This made our operations much simpler. I am sure you will hear more from others at the February meeting.
The Columbia Special Event is coming up the

first Saturday of February at McMichael Middle School from 8:00 am for antenna set up until about 3:00 pm. Come and be a part of the fun and fellowship.

73 de John N5AIU

email: jjordan@nacogdoches.k12.tx.us

VE TESTING

Our next VE testing is scheduled for Wednesday, February 17th 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 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 February 3rd 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 bring any show and tell items you might have received over the holidays.

NEWEST HAMS

Richard Blake – Lufkin

Brandon Christopher – Lufkin

Charles Anning – San Augustine

No calls had been issued at the time of writing this newsletter, but they are expected to be by the time of our next meeting. Please welcome them to our fraternity and assist them in any way you can.

BASIC ANTENNAS

PART 15

by

Thomas Atchison W5TV

In previous articles we have discussed a multielement directive array that is familiar to most hams, the yagi array. Let's go back and look more generally at multielement directive arrays. An element in such an array is usually an electrical half-wavelength long. Variations from this occur because in some types of arrays we want an element to show either inductive reactance or capacitive reactance so that it will serve as a director or a reflector. In previous articles we have considered elements that were parallel to one another. We now want to consider elements that are collinear i.e. end-to-end.

A simple collinear array consists of two electrical half-wavelength elements mounted end-to-end and fed in the center with a transmission line (Fig. 1).

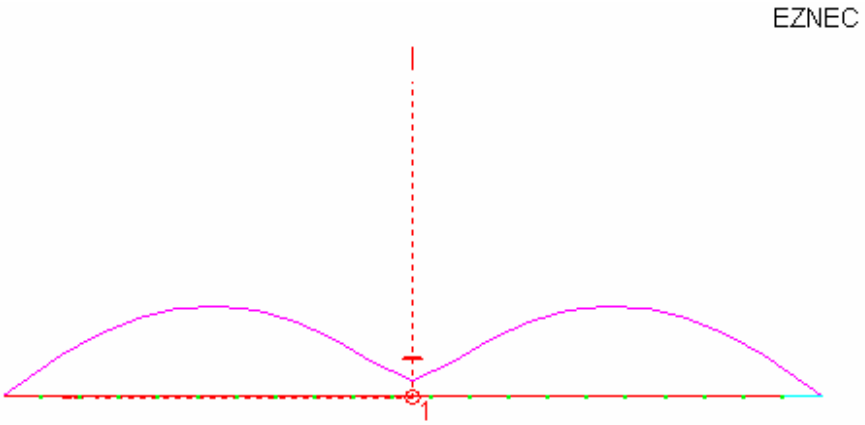


Fig 1

Here we are feeding the array at the point marked 1. There is a half-wavelength wire extending on each side of the feed point. The pink curves represent the current on the antenna. The current distribution has a full loop on each half-wavelength as you would expect. This is usually called 'two half waves in phase' because the currents are in phase.

If we design this antenna to operate at 14.1 MHz then each half wave is 33.2 feet so the total length is 66.4 feet. The radiation pattern for this antenna is in Fig. 2.

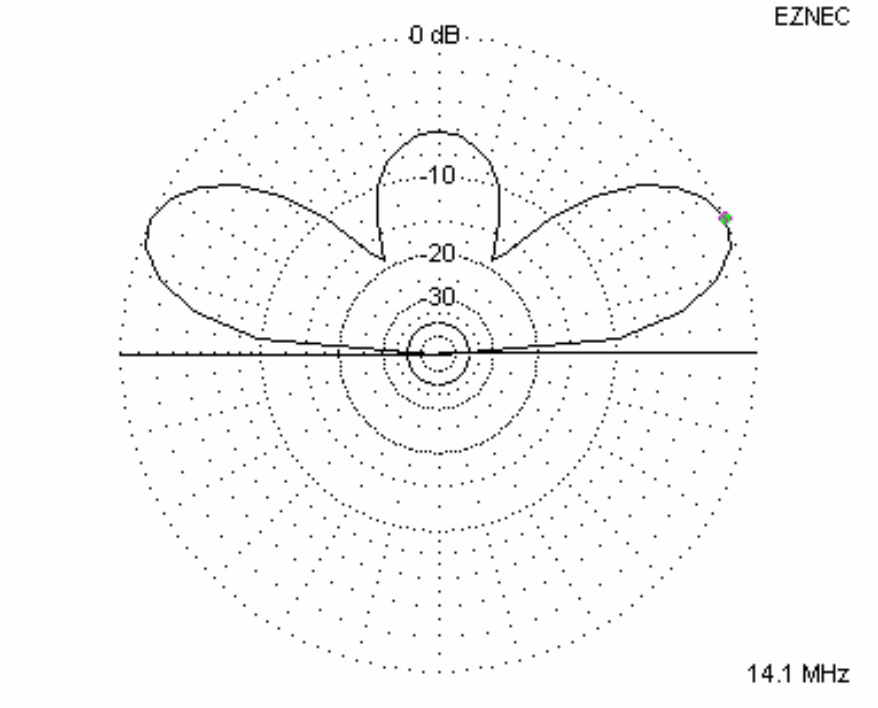


Fig. 2

Here we are looking into the end of the wire so the radiation pattern is broadside to the antenna. The angle where maximum radiation occurs is about 25 degrees. This simulation was for an array built of #12 wire located 40 feet above ground. The impedance at the feed point will vary depending on the conductor size, height, and other factors, however, it will be in a range from 4000Ω to 6000Ω. The antenna can be fed with open wire transmission line with very little loss. We would need a matching device to connect to a 50Ω source.

The simple collinear array as described above gives a gain of a little less than 2 db over a half-wave dipole. It is possible to obtain slightly more gain by an easy change in the array. If we make each element a little longer than a half wave-length this will increase the spacing between the two in-phase half-wave sections at the ends of the

wires. The section in the center will have a small amount of current of opposite phase. Studies have shown that a good length for each element is 0.64λ. An array of this sort is called an extended double Zepp. The gain of this array is about 3 db over a half-wave dipole.

For an extended double Zepp at 14.1 MHz a wave-length is 66.4 feet long. Therefore each element will be $0.64(66.4) = 42.5$ feet. Again, open wire transmission line and a matching device will permit efficient use of this antenna. An extended double Zepp antenna is modeled in Fig. 3.

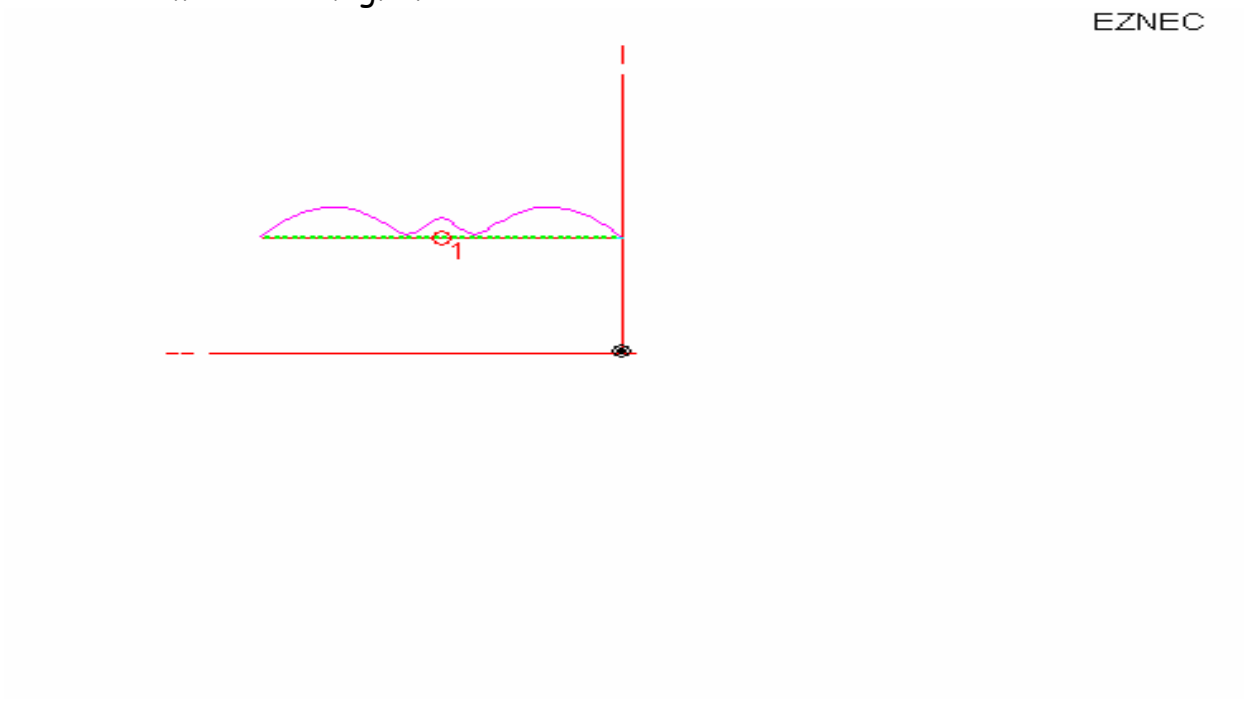


Fig. 3

The larger loops of current are on the half-wave segments of each element and the small current loop is on the wire between the two half-wave elements. The radiation pattern is maximum broadside to this array and is similar to the one in Fig. 2.

Radio Propagation
Part I

Troposphere (VHF-UHF) Ducting Basics

Do you ever wonder why sometimes you hear a distant station or repeater on 2 meters, 1.25 meters or 70 centimeters and think to yourself 'This is supposed to be a line-of-sight communications'?
There are many radio signal propagation effects associated with the ionosphere, the troposphere plays an important role too.
Well…. sometimes the normal limits on LOS (line of sight) range are exceeded as a rule.
One of the primary reasons for this is an effect called "*ducting*." VHF and UHF waves traveling through the atmosphere travel slightly slower than they do in free space, and that is because the density of air slows them down. The denser the air, the slower the wave speed through it. Under normal conditions, the density of air is the greatest at the surface of the earth and gradually reduces in density with altitude. Under fair, dry, and moderate weather conditions; the slight variations in air density have negligible effects on the path of radio waves passing through it. Frequently there are precipitous changes in air density due to weather fronts passing over an area or the heavy moisture burden of rain clouds. In such cases VHF and UHF can bend or duct between air layers of different densities.
Sometimes this ducting bends the radio waves downward so that the radio waves tend to follow the curvature of the earth. In such cases the LOS range is considerably greater than the optical LOS range.
This type of wave propagation is difficult to predict and impossible to predict accurately furthermore, it is not practical to plan on it for range improvement. When ducting conditions do exit, they generally do so for hours at a time.

Facts:

- ✓ Ducting caused by certain weather conditions can sometimes increase the range of VHF and UHF waves.

- ✓ VHF and UHF range is usually limited by physical wave shadowing of obstructions such as buildings and mountains.

- ✓ VHF and UHF frequencies cannot make use of skywave or ground wave propagation and depends almost exclusively on the direct wave. This restricts their use to line-of-sight communications.

- ✓ HF propagation can be LOS through ground waves or direct waves and BLOS (Beyond line-of-sight) though the use of sky waves.

- ✓ LOS range is greatly improved with increased height of either (or both) transmit or receive antennas.

- ✓ Diffraction of VHF and UHF waves can bend around sharp edges such as window frames or sharp ridges.

- ✓ Multipath distortion is caused by waves arriving at a receiver from more than one path. (If the emission is digital the multipath causes bit collisions)
- ✓ Radio wave propagation at VHF and UHF frequencies are primarily affected by local area topography (hills and valleys) and atmospheric conditions.

Types of Propagation

Line-of-Sight (LOS): Range, typically less than 20 miles, is limited by terrain obstructions and/or earth curvature.

- ✓ Range is also a function of operating frequency, power level, and antenna height.
- ✓ Offers possibility of high data rate transmission.
- ✓ Restricting range reduces adjacent area interference and eases frequency reuse requirements.

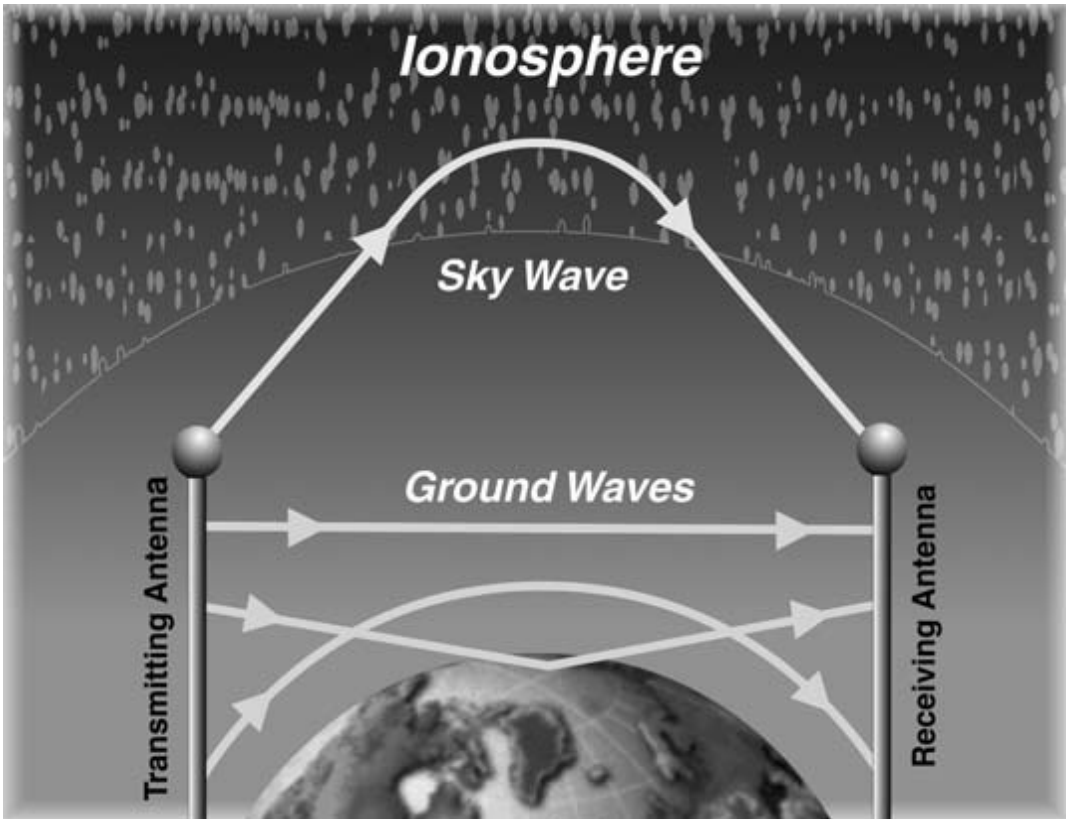
Ground (surface) Wave: Useful range is up to 30 miles on land, 180 or more miles over the water.

- ✓ Range depends on operating frequency and terrain obstructions.
- ✓ Requires vertically polarized antennas.

- ✓ Historically used for voice communications. Data rates are generally high, but may have some limitations depending on waveform used.

Beyond Line-of-Sight (BLOS): Range to about 250 miles using Near Vertical Incidence Skywave (NVIS).

- ✓ Can be used where satellite communication is not available.
- ✓ Terrain obstruction not a limiting factor, HF can communicate over mountains etc.
- ✓ Requires horizontally polarized antennas.
- ✓ Frequency range generally restricted to < 10 MHz.
- ✓ Operating frequency often dependent on ionospheric conditions and Solar Cycles.



Recommended good reading on Tropospheric Ducting and other types of propagation:

ARRL Handbook
Radio Propagation – Principles and Practice (RSGB) By: G3YWX

I also recommend the ARRL Radio Frequency Interference (EC-006) on-line course.
Last year I took the course on-line and it was great.
$70.00 well spent!

W5TXR
Mark A. Lacy

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