May 2012 Volume 05-2012

Nacogdoches Amateur Radio Club

2012 CLUB OFFICERS

Pres: Rusty Sanders – KD5GEN

VP: Mike Brown – KF5KEY

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.

MAY MINUTES

The May meeting of the Nacogdoches Amateur Radio Club (NARC) was held as scheduled on May 2nd. **President Rusty KD5GEN**, opened the meeting at 7:00 p.m. in the Parish Hall of Christ Episcopal Church. Nineteen members and three guests were present. Each person present introduced himself. Minutes of the previous meeting were approved as published. The Treasurer's report was read.

Old Business:
The club UHF repeater is in need of repair. The club 147.32 VHF repeater needs cavity filters installed to prevent desensing by the County Fire Repeater at the same site.

New Business:
Bob K5ME reported that he worked the Florida QSO Party.

The Armed Forces cross-band test is scheduled for May 12.

The Texas Simulated Emergency Test is scheduled for May 5. It is expected that most comm will be digital. A local 2M net will be run by our EC, **KD5FEE**.

Bill WK5F, showed his version of the tri-band quad designed by Wayne N6NB. Bill plans to use this antenna on his latest rover build. Plans and materials are available for

others who wish to also build one.

Meeting adjourned at 7:51.

OSCILLATIONS FROM THE CHAIR

73 to all. Another month has passed and many exciting things will be occurring in the month of June.

For those of you going to Ham-Com, be prepared to spend some money and come back with some goodies for show & tell in July. For those of you participating in the Neches River Rendezvous, may a cool front come through and moderate the heat. Field Day is a big event for the club and we need a lot of participation to make this a success. Please come out and join us for this event. Bring along a friend, relative, and neighbor and let them see what Amateur Radio is about.

In reading through the current *QST*, I came across an interesting article on page 96 regarding the Society of Wireless Pioneers. This was a group of people whose position has virtually vanished. They were stationed on ships of all types and they provided communication for the ship's captain and crew. Originally, this was by means of code transmissions and later by voice. This position has faded away in most instances with modular concepts, digital communications and satellite communications. This is the only thing that worries me on a cruise, is the system really fail-safe? Do they have someone who can really diagnosis the problem and replace the correct module to allow the ship to navigate properly and not tip over!

Back in my college days, I use to monitor a ship to shore radio operator located in New Orleans. Ship radio operators would place calls through this operator who hooked them into a phone patch. I have heard many calls regarding everything from when the ships were expected to dock, what items were to be loaded or off-loaded, equipment needed for the ship and last but not least, one very irate wife of a merchant sailor who had discovered his affection for one of her friends. This was a very amusing phone patch that never used any foul language but she worked him over verbally.

In the latter part of the article, there is a mention of a web site that is available to record those silent keys of the amateur ranks. I did a quick glance of the website and did not see any names of former NARC members listed. I will not be able to attend our next meeting but I would like to know your thoughts on us compiling information on SK's of our club and Nacogdoches and send these in to be entered into the database.

This would entail contacting a family member and obtaining basic bio information and if possible a picture of the

deceased. Along with this process, we should obtain permission from the family to gather and present this data. Amateur radio has been a part of Nacogdoches County and East Texas for a very long time and I feel those folks should be remembered.

I would like to know your feelings on this proposal and submit those people you may know of that are now SK's. Here is a listing of those that I can recall.

John Jinkins WA5MAW
Albert Fisher AC5Z
Dan Cassell KM5LU
Kenneth Hughes KK5BE
Howard Hinton KI5KR
Kelly Gilkinson McLaughlin KE5AKV
Travis Newton KD5GRK
Frank Blackburn WB5WLX
Ken Lilly WM5J

Please set aside time in your schedule to come to the meeting and offer your thoughts to how our organization can be better.

KD5GEN- Rusty

email:
rusty.sanders@att.net

FROM THE VICE PRESIDENT

Hello again to all of you. It seems impossible that a month has passed, but here we are again with June creeping up on us. And what a June it will be....here's a partial list of what is happening in June:

1. Let's begin in May, the 29th: Primary elections... please vote. Do you really want another four years like the last?

2. June 2 - the Neches River Rendezvous. If you haven't volunteered yet, please do. Help still needed.

3. June 2 and 3: Special Event Station from Seawolf Park, Galveston. Brazos Valley ARC operating from radio rooms of the submarine, USS Cavalla and the DE, USS Stewart 10- 80 meters on SSB and CW. Being an old submarine sailor, I had to put this one in.

4. June 6 - NARC monthly meeting at 7:00 PM at Christ Episcopal Church.

5. June 8th and 9th: Ham-com at Plano. Hope to see you there.

6. June 20 -NARC monthly test session. 7:00 PM at Christ Episcopal Church.

7. June 23 and 24: The annual Field Day operating once again at the airport. Please come and bring a friend. Great chance to introduce prospective hams to the hobby. Let's make this the very best Field Day ever.

Now I know that I have missed many of the events that are occurring, so please come to the meeting on the 6th of June and let us know what I've missed.

As I am writing this, I am listening to a Flex 1500 SDR radio. This is my first opportunity to use one of the SDR's, and I must admit, I am totally impressed. Even with as little as I know about these marvels, I truly believe that I have never

heard a receiver with such clarity. And the ability to isolate one station from another is nothing short of miraculous. No more having to buy and install hardware type filters. You have at your fingertips an almost limitless supply of filters and the cost...What cost? Included in the purchase price. I can't wait to learn more about these types of radios. At this point, the only problem with this radio is its operator's lack of knowledge, but I am studying.

WARNING: There is one HUGE drawback to this type of radio. While showing this radio to my wife, she asked the question, "You mean that you are doing EVERYTHING with just that little box and your laptop?" I immediately puffed up and proudly announced, "Yep...amazing isn't it!?!" To which she replied, "Well...yes, that is amazing, but the even more amazing thing is that now you can get rid of all that huge accumulation of radios and piles of junk that you've gathered over the years and replace them with that one little box...."

It's obvious that wives know nothing about electronics.....

Hope to see you at many of the events during the month of June.

73 to all....

KF5KEY – Mike
Email: michaelleebrown@hotmail.com

VE TESTING

Our next VE testing is scheduled for Wednesday, June 20th 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 June 6th** 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 ANTENNAS

PART 43

by

Thomas Atchison W5TV

Transmitter output is usually connected to an antenna via a transmission line. This transmission line may be coaxial cable, ladder line, open wire line, a twisted pair of wires, or some other medium. We usually think of a cable as a transmission line when it has a length greater than λ/8 at the operating frequency where:

$$\lambda = 984/f_{MHz}$$

For example, a wavelength at 144-MHz is:

$$\lambda = 984/f_{MHz} = 984/144 = 6.8 \text{ feet.}$$

A connecting cable is a transmission line if it is longer than 6.8/8 = 0.85 feet or 10.25 inches.

Since a transmission line is constructed using wires then each wire has associated inductance, L, which we can think of as distributed over the length of the line and in series with each line. There is also capacitance, C, between the two lines that is also distributed over the length of the line and can be thought of as shunted across the line. These distributed L and C create an impedance that is characteristic of the line. This impedance is called the characteristic impedance or surge impedance of the transmission line and is usually designated by Z_O. If the line is perfect, that is, if the conductors have no resistance and there is no leakage between them, then the formula for the characteristic impedance is

$$Z_O = \sqrt{\frac{L}{C}}$$

where L and C are the inductance and capacitance, respectively, per unit length of line. Practical values of Z_O for parallel-conductor lines range from about 200 ohms to 800 ohms. Coaxial lines are typically between 30 ohms and 100 ohms.

Let's begin our discussion by considering a transmission line that is infinitely long. Suppose the line is perfect (has no loss) and suppose we introduce an alternating voltage across the input terminals. This voltage creates an alternating current in the line that propagates along the line forever. Now suppose we cut this line at some point and introduce a pure resistance across the cut that has the same value as the characteristic impedance of the line, Z_O. Then the line would appear to be an infinitely long line as far as the current is concerned. That is, the current would be completely absorbed by the load. No current would be reflected back down the line. A transmission line terminated by a resistance that is equal to its characteristic impedance is called a nonresonant transmission line.

The preceding discussion shows that to achieve maximum power transfer over a transmission line the line impedance, Z_O, must match the load impedance. If a line is terminated in a resistive load that is equal to the characteristic impedance of the line, then the system is matched. In this case power is transferred outward along the line from the transmitter until it reaches the load (antenna) where it is completely absorbed. The current in such a line is equal to the applied voltage divided by the characteristic impedance, and the power in the line is given by either

$$\frac{E^2}{Z_O} \quad or \quad I^2 Z_O .$$

Now let Z_L denote the impedance of a load that terminates our transmission line. If $Z_L \neq Z_O$ then some of the current will be absorbed by the load and some will be reflected back along the transmission line. In this case we call this a mismatch of the transmission line to the load. The more the load impedance differs from Z_O, the greater the mismatch. If the transmission line has a short at the load end then $Z_L = 0$. On the other hand, if the transmission line is open at the load end, then $Z_L = \infty$. In all other cases, Z_L may be complex, that is, it may be composed of both resistance and reactance.

The reflected current (voltage) is combined with the incident current (voltage) to form standing waves of current (voltage) along the line. These standing waves of current (voltage) vary along the transmission line from a minimum to a maximum value,

however, their nodes remain fixed. As we discussed in a previous article, the SWR of the transmission line is defined to be

$$SWR = \frac{E_{MAX}}{E_{MIN}} = \frac{I_{MAX}}{I_{MIN}}$$

where E_{MAX} is the maximum voltage,
E_{MIN} is the minimum voltage,
I_{MAX} is the maximum current, and
I_{MIN} is the minimum current.

The reflection coefficient is usually denoted by the uppercase Greek letter gamma, Γ, and it is defined in terms of the load impedance and the characteristic impedance of the transmission line as follows:

$$\Gamma = \frac{Z_L - Z_O}{Z_L + Z_O}.$$

As we said above, the load impedance may be a complex number having both amplitude and phase, therefore, Γ may be a complex number. If the transmission line is a high-quality, low-loss line, at low frequencies, then the characteristic impedance, Z_O, is almost completely resistive. We assume that this is true.

The amount of power lost due to reflection is a function of the reflection coefficient (Γ) and the standing wave ratio (SWR). These are determined by the amount of mismatch between the source and load impedances. If the load contains no reactance (if the load is purely resistive), then we can express the SWR as a function of the load impedance, Z_L, and the characteristic impedance of the line, Z_O. This is as follows:

$$SWR = \frac{Z_L}{Z_O} \quad if \ Z_L > Z_O \ and$$

$$SWR = \frac{Z_O}{Z_L} \quad if \ Z_O > Z_L.$$

For a perfect match $Z_L = Z_O$ and the SWR = 1.

For a half wave dipole the load resistance is $Z_L = 75\ \Omega$. If we use a transmission line with $Z_O = 50\ \Omega$ then the SWR is given by

$$SWR = Z_L/Z_O = 75/50 = 1.5.$$

You can also compute the magnitude of Γ from the SWR value using the formula

$$|\Gamma| = \frac{SWR-1}{SWR+1}.$$

If we calculate the magnitude of the reflection coefficient for the dipole discussed above we have

$$|\Gamma| = \frac{SWR-1}{SWR+1} = \frac{1.5-1}{1.5+1} = \frac{0.5}{2.5} = 0.2.$$

In this case, the reflected voltage and reflected current are equal to 20% of the incident voltage and current. The reflected power is proportional to the square of either the voltage or the current as mentioned above. Therefore, the reflected power is $(0.2)^2 = 0.04$ times the incident power. In other words, the reflected power is 4% of the incident power. This means that 96% of the power will reach the load (antenna).

Many people say that an SWR of 2:1 or less is reasonable for an antenna system. Let's examine that possibility. If we use an SWR of 2 then the reflection coefficient is 1/3 = 0.333 and we see that the reflected power is $(0.333)^2 = 0.11$ times the incident power. This means that the reflected power is 11% of the incident power. Therefore, 89% of the incident power will reach the load. Getting 89% or more of your power to the antenna is certainly acceptable. Of course this assumes you have no loss from the transmission line itself. In a real transmission line there is loss because the conductor has resistance and there is leakage between conductors. This is a topic for future discussion.