April 2007 **Volume 4-2007**

Nacogdoches Amateur Radio Club

Pres: John Chapman – KC5MIB

VP: Andy Delgado – KE5EXX

Sec/Treas: Army Curtis - AE5P

APRIL MINUTES

The April meeting of the Nacogdoches Amateur Radio Club (NARC) was held as scheduled on April 4th. Thirty-two members and seven guests were present. **President John, KC5MIB**, 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 corrected. Treasurer's report was read.

Please welcome our newest member, **Stuart Wood, KC5ELA**. Stew was a member of NARC many years ago, and we are most pleased to have him now officially re-join the club. Incidentally, Stu has just upgraded to General and has a new vanity call of **W5GSW**. Congratulations Stu and welcome back to the club.

Field Day is scheduled for June 23 and 24. There will be a breakfast at IHOP at 7:00 a.m. on June 23, followed by the antenna party and set-up at Pecan Park at 8:00. **Andy, KE5EXX**, is the man in charge.

The Regional Simulated Emergency Test (SET) was held with good participation locally. Some action items were identified for follow-up.

Skywarn spotter training was held as scheduled. There was a good turn-out and excellent training.

Reminder of the June VHF contest June 9 and 10. K5QE is looking for operators at his contest station in Hemphill. Experience not required. Marshall also has loaner equipment available for rovers.

Central States VHF Society convention in San Antonio July 28-29. Several members are planning to attend.

Heartbeat Pregnancy Center 5K run this coming Saturday, 7:30 a.m. at TJR.

Columbia Geospatial Center is looking for suggestions on equipment for an Amateur Radio station for their facility. **Army, AE5P**, will work with **PR Blackwell, KC5COQ**, their director.

Kent and **Andy** report the new WinLink antenna now installed on the roof of the Fredonia Hotel. Equipment to be installed as soon as time permits.

Kent reports the weather station has been received for the 32 repeater. Installation to be scheduled.

John, N5AIU and **Bert, AC5Z**, set up a portable HF station for the Dads and Lads Day at Camp Purtle on March 31. A number of contacts were made for the scouts there.

ARES ID cards. Bring $4 to the next meeting and **Andy, KE5EXX** will take your picture and make your ID card.

Red Cross is doing shelter training, and has asked **Kent, KD5SHM**, to do a presentation on ham radio.

Meeting was adjourned at 8:55 p.m.

Show and Tell:
Marshall, K5QE showed off some new heliax connectors he has acquired.

Army, AE5P, showed an "All Band Power Meter" he built from a kit by DEMI.

Andy, KE5EXX presented the final results of the 2007 NARC QRO WAS contest.

A short program on written message handling was presented by **AE5P, W5TV** and **N5AIU**.

PRESIDENT'S CORNER

Maliciously stolen from the ARRL E-Letter:

"…ARRL reiterates its recommendation that members carefully review any consent document permitting a private organization to conduct a background investigation on that person. The current Red Cross background check consent form does include permission, without further consent from the volunteer, to conduct a consumer report and/or an investigative consumer report. The Federal Trade Commission and Federal statutes define investigative consumer reports as including a mode-of-living check as well as certain credit checks.

ARRL will not suggest what organizations or agencies should or should not be supported by volunteer Amateur Radio communications. ARRL does wish to facilitate the provision of volunteer services, however."

Many of you have already read this and probably more than a couple of times. The Memorandum between the ARRL and the American Red Cross will be reviewed this summer. I have talked to Chris Imlay, ARRL's General Counsel about other radio and broadcast related items.

I will tell you, he is a straight shooter. I don't have a crystal ball. Even my best guesses aren't always the best. My guess on this one: the ARC won't come off their stance. As the ARRL has suggested, use your own best judgment and just like the warning to shoppers, *caveat emptor,* let the "buyer" beware.

Field day is just around the corner and it sounds like everything is falling into place for that weekend. The weather has been more or less cooperative, so let's hope we get all sorts of nice rain with no nastiness involved.

I look forward to seeing everyone at the next meeting and please bring your Belton goodies.

73 to all,
John Chapman
e-mail: kc5mib@arrl.net

V.P.'s ELEMENT…

Technology…isn't it grand!

I'm writing this to you as we are on the way to the NASA Space Center in Houston. I've got my laptop. I've got my Treo 650 (PDA and cell phone in one). I've got my VX-5R. My wife has her cell phone. Andrew has the portable DVD player. We're all tech'd up.

If I had a TNC with me we could do Winlink/AIRMAIL. If I added a GPS we could do APRS. We're going to be in and around Houston, if I had a newer Icom radio we could do DStar.

I'd love to rig up for HF Mobile, but since we're in my wife's car, that is out of the question. Perhaps someday she'll see the light…Probably not.

The next monthly meeting of the Nacogdoches Amateur Radio Club is May 2, 2007. We will be discussing many things, probably the biggest being Field Day this June. For our program, we will be revisiting Winlink/AIRMAIL, with an emphasis on AIRMAIL. We will setup one or more of our Orange Boxes, the club's portable antenna and a laptop connected to a projector. We will install AIRMAIL on the laptop, demonstrate how to discover what serial port you need to select, and get on the air digitally through the W5NAC-10 TELPAC gateway. Hopefully we will also be able to demonstrate station to station AIRMAIL.

Now back to NASA. This is our second trip in about 6 months. We liked it so much at Christmas we bought a family membership. (Of course with Andrew hoping to grow up and be an

Astronaut, you can imagine we will make many more trips in the future.) I have to tell you how encouraged I am to see some of the training going on at the JSC Training and Mockup Facility. There are complete mock ups of the International Space Station and enough pieces/parts to make up 2 complete Space Shuttles. There is an area of the facility dedicated to training crewmembers how to repair damaged thermal tiles while in flight. I've included a picture.

Speaking of pictures. Don't forget we will be taking pictures for ID cards at this meeting. Bring $4 and a smile.

See you Wednesday!

73 de KE5EXX
email: ke5exx@arrl.net

VE TESTING

Our next VE testing is scheduled for Wednesday, May 16th 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 $14 to cover the cost of the exam(s). Correct change is always very much appreciated.

73 de AE5P

email: ae5p@arrl.net

TRAINING MATERIALS

The club has purchased several copies of the latest ARRL "Now You're Talking" books, which provides everything a person needs to be able to pass the Technician class Amateur Radio license exam. Anyone may "borrow" one of these books for a $20 deposit. When you return the book in good condition, you will get your deposit back. Interested? See **Army, AE5P**.

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.

NET ETIQUITTE

We have many new operators checking into our nets, and I certainly want to do everything possible to encourage them to continue their participation. There are a couple of items that may not be real obvious to a new operator however, and I hope maybe these comments will prove helpful.

Most of our nets are "Directed Nets". This means that ALL transmissions are to be directed to the net control station. You should not direct any comments to another station checking into the

net without first getting permission from the net control operator.

While not strictly required by the FCC rules, it is always very helpful if a station will give their callsign when they first begin a transmission. The rules DO REQUIRE that all stations give their callsign at the END of their transmission. Unfortunately, I hear a lot of stations that do not always do this.

All of our repeaters have a "courtesy tone". Here is how you use it:

When a station stops speaking on their radio and releases their PTT switch, there will be a short pause of about 1 second before the repeater gives the "courtesy tone". The repeater will continue to hold its signal on the air for several seconds more before it drops completely.

If another station wants to "break in" to an ongoing conversation, they should wait until the person speaking stops, and then immediately say "break" before the courtesy tone sounds. There is only a one second pause there, so you have to be quick about it.

The persons using the repeater should always wait until they hear the courtesy tone before they start speaking. Don't jump the gun and start speaking before the courtesy tone is heard. However, it is NOT necessary to let the repeater drop its signal completely before you start to speak.

I hope this helps maybe just a little. Let me know if more on this topic would be useful.

73 de AE5P

NEXT MEETING

The next meeting will be on Wednesday May 2nd 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. Hope to see y'all there.

Basic Electronics Part Fourteen By Thomas Atchison

When electrons move through a wire they produce a magnetic field. The magnetic field extends outward from the wire. The field is stronger close to the wire and it gets weaker as you move away from the wire. Larger currents produce stronger magnetic fields.

If the wire is bent into several circles next to each other, the magnetic field around each piece of wire adds to the force of the pieces on either side creating a stronger magnetic field. The magnetic force lines wrap through the center of the cylinder of wire and around the outside. A coil of wire used in an electronics circuit is called an inductor. An electric current through an inductor creates a magnetic field.

An inductor may consist of coils of wire that are stiff enough that they remain in the coiled position. Such

inductors are called air-core. Some inductors consist of coils of wire wrapped around a piece of iron or a rod containing powered iron. This is called an iron-core inductor. If we have an air-core inductor and in iron-core inductor with the same number of turns of wire and the same current, the iron-core inductor will produce a stronger magnetic field than the air-core inductor.

Many electronic circuits use a special type of inductor core called a toroid. A toroid is an inductor wound on a core that curves into a donut shape. Toroid cores are available in many powdered-iron and ferrite core materials. Remember the magnetic field produced by an inductor goes through the center of the coil. The magnetic field from a straight coil curves back around outside the core, because magnetic-field lines form a closed loop. A magnetic field inside a toroid core doesn't have to loop around outside the core since the toroid forms a donut. In this case, because the donut closes back on itself, the field stays completely inside the core. This is one of the advantages of using a toroid inductor.

Some electronic circuits require an inductor with a magnetic field that can be changed. If we have an air-core inductor, we can change the magnetic field by attaching a lead to the inductor at a turn that is not at the end of the inductor. This is called tapping the inductor. We can attach leads to any point in the coil and in some circuits we can have multiple taps that are accessed using a multi-position switch. This is common in antenna tuners or in radio frequency amplifiers. We can also make an adjustable inductor with a powdered-iron or ferrite core that moves in to or out of the center of the coil. We can wind the coil on a form made of ceramic or other material. Then a slug or piece of ferrite core material is threaded into the ceramic form. A screw adjustment allows us to adjust the position of the material in the coil. This changes the magnetic-field strength.

The inductance of a coil is a property that relates to the magnetic-field strength produced by the coil. Inductance is represented by a capital L. The basic unit of inductance is the henry, abbreviated H. A 1-henry inductor is physically very large so we use the millihenry (mH) which is 10^{-3} H or the microhenry (μH) which is 10^{-6} H in most electronic circuits.

Four main factors help determine a coil's inductance. These are as follows:

1. Number of turns,
2. Spacing between turns,
3. Coil diameter, and
4. Type of core material.

If we wind more turns in a coil, we increase the inductance. If we space the coils further apart, we decrease the inductance. If we wind a coil with a larger diameter, we

increase the inductance. The fourth factor affecting inductance is the type of core material in the center of the coil. Permeability is a measure of how easily a magnetic field goes through a material. Permeability also tells us how much stronger the magnetic field will be with that material inside the coil. Permeability is usually given as relative permeability. This means the value compares the material with the permeability of air. If a ferrite material has a relative permeability of 50, then a coil with that material as a core will have 50 times more inductance that a similar coil that is air-core.

We now come to the question of the purpose a magnetic field has in an electronics circuit. Suppose we place an inductor, a battery, and a switch in a circuit, as in Fig. 1.

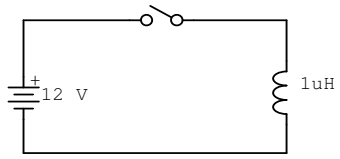

Fig. 1

When we close the switch, current begins to flow in the circuit and this flow of electrons causes a magnetic field to build around the inductor. This magnetic field will reach the strength set by the current and inductance, and it will not change as long as the steady current continues. If we open the switch, breaking the circuit, the magnetic field collapses. This collapsing magnetic field induces a voltage across the inductor, trying to maintain the current. As a matter of fact, as the magnetic field was increasing, there was also an induced voltage that tries to oppose the current. That is why the current increases gradually when we first close the switch. In general, the induced voltage of a collapsing magnetic field has the opposite polarity to the applied voltage when the magnetic field was increasing. The magnitude of the induced voltage depends on how rapidly the current changes. If we have a strong magnetic field built up in an inductor and we suddenly break the circuit, there is a large induced voltage across the inductor. This large voltage tries to maintain the current through the inductor. This induced voltage can be many times larger than the original applied voltage. It could be so large that we have a spark jump across the switch contacts as they open. This can be seen if we use a knife switch in the circuit.

Now consider the circuit in Fig. 2.

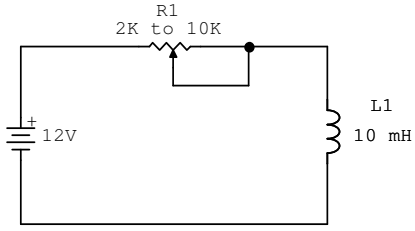

Fig. 2

The inductor is a piece of wire so it has very little resistance to this direct current. We can use Ohm's Law to calculate the circuit current. If we set the resistance to 5K ohms, then $E=I\,R$, and we can solve this for the current.

$$I = \frac{E}{R} = \frac{12}{5000}$$

Therefore:

$$I = 2.4\,x10^{-3}\,A = 2.4\,mA\,.$$

There is a magnetic field around the inductor with this current through the circuit. If the current doesn't change, the magnetic field remains constant. If we adjust the resistor to increase the resistance, the current begins to decrease. The inductor reacts to this change by returning some of the energy stored in its magnetic field. This returned energy produces a voltage across the inductor that tries to keep the same current flowing through it. The current does decrease, however, as the magnetic-field strength decreases. The inductor prevents the change from occurring instantly. The new current maintains a smaller magnetic field. If the resistance is increased to 10K ohms, the current decreases to 1.2 mA. How do we know this? What would happen if we decreased the resistance to 2K ohms?