

# Nacogdoches Amateur Radio Club

## 2018 CLUB OFFICERS

Pres: RM Blake - K5AGE

Vice Pres: Jack York - KG5POU

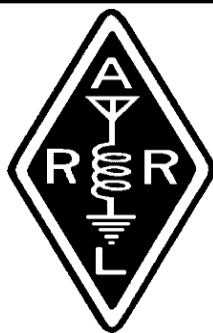
Sec/Treas: Army Curtis - AE5P

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 and having fun.



## OCTOBER MINUTES

The October meeting of the Nacogdoches Amateur Radio Club (NARC) was held as scheduled on October 3rd. President RM K5AGE opened the meeting at 7:00 p.m. in the Lunch Room of Christ Episcopal School. Twelve members and two guests were present. Each person present introduced them self. Minutes of the previous meeting were approved as published. The Treasurer's report was read.

Several contests, both recent and upcoming were discussed. The September

ARRL VHF contest, the CQWDX RTTY contest, and the Texas QSO Party were all discussed.

Short discussion on comments on recent ARES proposal from ARRL made by AE5P on behalf of the club, and by our EC KC5MIB

**President RM** appointed **Army AE5P**, **John KC5MIB**, and **Andy KE5EXX** to the nominating committee. The committee is charged with developing a slate of club officers to be voted on at the November meeting.

**Army AE5P**, as Secretary/Treasurer of the club, made a motion to reduce club dues from \$24 per year to \$20 per year. After discussion, the motion passed. New dues

will become effective for 2019.

Meeting closed at 7:22 p.m.

Program: **Jerry Goodson W5BFF**, the NTX SEC and ASM, presented an excellent program on the recent proposed changes to the ARES strategic plan. Jerry thanked the club and our EC for sending written comments to ARRL on these proposed changes.

## FROM THE PRESIDENT



## November Meteor Showers

Monday, November 12<sup>th</sup> from midnight to dawn should be a fine night to view the "peak" of the Northern Taurids meteor shower. This is traditionally a weak shower, with only 5 meteors per hour at the peak. But, we have a young moon setting early and the debris that produce these meteors are larger than average. This large grain size produces large and colorful fireballs. Best viewing time is 1am local.

Another meteor shower peak will be the Leonids on November 17<sup>th</sup> with 15 meteors per hour. A bright moon will set around midnight on this day, so best viewing will be 3 or 4am local time. As the names of these meteor showers imply, look to the Taurus constellation for the Taurids shower and the Leo constellation for the Leonids shower

73 de RM Blake K5AGE  
[k5age@fastmail.com](mailto:k5age@fastmail.com)

## From the VP Chair

### IN THE PURSUIT OF 80 M

This band has been interesting to listen to but I need to do more than that so... Time to build a new antenna!

I have been a fan of the dipole, that is no secret. It is efficient and easy to make. However, this is not plan A for the 80 meter band. The plan is an elevated vertical using aluminum wire with the radials at 10 feet. Time to broaden my horizon in antenna building.

At this point I have a shortcut available in the installation and his name is Ralph Hollingshead, drone pilot extraordinaire. He has helped several fellow HAMS with antenna raising using those piloting skills, no doubt honed with many hours of practice. He is though,

only one of several assets in the club with the skills and penchant for HAM work. Army's expertise is second to none in all things HAM and has also been of great help to me personally and no doubt if there is a problem he can troubleshoot it.

But... The experience of doing it yourself I see is an invaluable teacher and lends to a sense of accomplishment as well. So now what to do? Think, Think, Think as a wise old sage, Winnie the Pooh said on occasions that required serious contemplation and a decision matrix.

I am really leaning on using my 3 foot model rocket to pull the string up and over the pine trees in the backyard. Just the chance to brush up on my Trig and bring out the scientific calculator not to mention that Luke would love to see Dad launch a rocket powered by C series engines in the backyard is worthy of attempt. Now just need

to get a string release set up on the rocket and I am sure this won't be a problem but to choose ... mechanical or electronic. What could possibly go wrong??

To be continued....

73 de Jack York

KG5POU

[gtjakco@yahoo.com](mailto:gtjakco@yahoo.com)

## NOTES FROM OUR EC

The 2018 Hurricane season will end this month; we have 30 days until it ends. There are no hurricanes in the Atlantic.

I checked into the Hurricane Research Division's website. They have a lot of neat data there. They started recording hurricane data in 1851. From 1851 - 2015 (last time it was updated) there were only 6 hurricanes in November. I'm not a weather forecaster. Taking a wild guess I expect we probably won't see much

more activity for the rest of the season. But, I've been wrong before so you never know.

October was wet! If my math is correct we had over 12 inches at the plant, some of you may have measured more. The official numbers in Lufkin showed they had received 14.40 inches. We had the usual warnings, Attoyac Bayou flash flooding, Neches and Angelina river flooding, and tornado watches. Thankfully, we didn't have to respond. It's been interesting, to say the least.

How prepared are you for winter? One forecast I heard, said warmer and dryer, another warmer and wetter. Make your best guess, put the bones in the cup, shake and see what falls out.

Have you made your final winter preparations, winterized the antenna farm, checked the generator, winterized the car, new batteries in the smoke detector? November 4 we fall back

from Daylight Saving Time and that is a great time to put fresh batteries in the detectors.

ARES:

If you missed the October meeting, you missed visiting with Jerry Goodson, W5BFF. Jerry is an Assistant Section Manager and the Section Emergency Coordinator (SEC) My reports are passed up to him and then on to the ARRL.

Jerry discussed the ARES planning document for updating ARES. I won't go into the whole of the discussion. Let's just say there were some problems deploying an ARES team to support a disaster and this prompted the proposal to fix the errors and go forward.

I hope you have taken the time to read my and Army's comments to the working group's proposal. Jerry gets to see all of them and through his contacts to talk to other SECs. Our comments were very similar to others across the country. We

shall see how the League handles it.

Remember to check into the weekly nets on the 84 and 32 repeaters. It gives us a bit of practice operating on a net and hopefully prepares us in case we have to set up for an event.

73 de John Chapman  
KC5MIB  
[kc5mib@arrl.net](mailto:kc5mib@arrl.net)

## VE TESTING

Our next VE testing is scheduled for **Wednesday November 21 at 7:00 p.m.** in the Lunch Room of Christ Episcopal School (Our usual meeting place).

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](mailto:ae5p@arrl.net)

## NEW HAMS

We are pleased to report that four more students at Huntington High School successfully passed their Technician exams. New call signs include KI5CAP, KI5CAQ, KI5CAR, and KI5CAS. If you hear them on the air, please make them feel welcome.

## TWO METER CLUB NETS

Remember to join us each week for the two 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.

## NEXT MEETING

The next meeting will be **Wednesday November 7th at 7:00 p.m.** in the Lunch Room of Christ Episcopal School (Our usual meeting place). Election of club officers will be held. A program is planned.

## DECEMBER MEETING, CHRISTMAS PARTY AND WHITE ELEPHANT AUCTION

December means not only our NARC monthly meeting, but also our Christmas Party and White Elephant Auction.

All of this will be held on **Wednesday December 5<sup>th</sup>** beginning at **6:00** in the Christ Episcopal School Lunch Room (our usual meeting place). Dinner is pot luck with the club furnishing drinks and paper goods. After a very short meeting, we will hold our popular White

Elephant Auction with all proceeds benefitting the club. Bring a White Elephant gift, wrapped or not, and ideally accompanied by a note giving a clue as to what it is.

The auction is always the most fun when lots of folks are bidding on the goodies, which can be ham radio, electronics, computer related, or "something completely different" as Monty Python used to say. There are always several wrapped gifts especially intended for the ladies that you don't want to miss.

**The entire family is invited and most welcome to attend. Plan now to join us for a fun evening.**

## UPCOMING EVENTS OF NOTE

Mark your calendars for the following events coming up in the next few months. Full information on these events and much more can be found at <http://www.contestcalendar.com/contestcal.html>

Items in RED are NARC Club Events

ARRL Sweepstakes -  
CW

Nov 3-4

ARRL Sweepstakes -  
SSB

Nov 17-19

CQ WW DX - CW

Nov 24-25

ARRL 10 Meter

Dec 8-9

## Solid State Devices - Part 1

by

Thomas Atchison, W5TV

Most of the equipment we have today utilizes devices such as semiconductor diodes, transistors, and integrated circuits. These are solid state devices that populate both our transmitters and our receivers. These are called solid state devices because they are constructed using semiconductor materials. A semiconductor is a crystalline solid with intermediate electrical conductivity between a conductor and an insulator. Semiconductors can be pure elements, such as silicon or germanium, or they can be compounds such as gallium arsenide or cadmium selenide. In a process called doping, small amounts of impurities are added to pure semiconductors causing large changes in the conductivity of the material.

The two basic types of semiconductors are called N-type and P-type. N-type material has extra electrons in the crystal structure, called donor or 'free' electrons, resulting in a negative charge in the structure. P-type material has space for additional electrons which are, in effect, acceptors or 'holes' for electrons. P-type material has a shortage of electrons therefore it has a positive charge. If we join an N-type semiconductor to a P-type semiconductor the P-type material will attract the electrons from the N-type material. Some free electrons from the N-type material cross the PN junction and fill some holes in the P-type material. This creates a region between the two semiconductor materials that has no holes or free electrons. Since the holes and electrons are 'depleted' this region is called a **depletion region** (Fig. 1). As some of the free electrons move into the depletion region and fill holes, the impurity atoms they come from become positively charged ions. As electrons fill holes in atoms of the P-type material these become negatively charged ions. The result is that the depletion region grows larger. The negative charge on the junction's P side increases and this repels more electrons that might try to cross the junction. The positive charge on the junction's N side also increases, and that attracts electrons back to the N material. The electric charges also prevent too many holes from crossing the junction into the N-type material. The device becomes electrically stable.



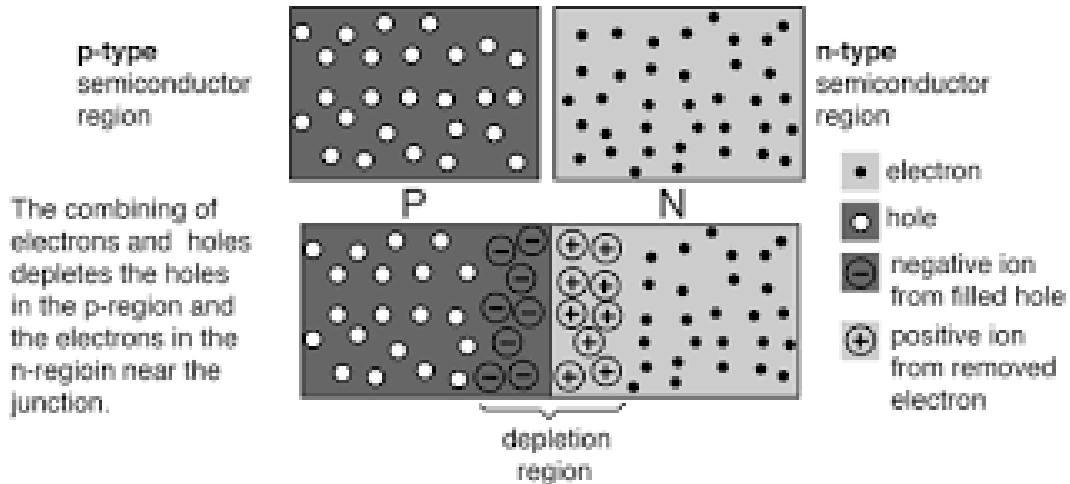
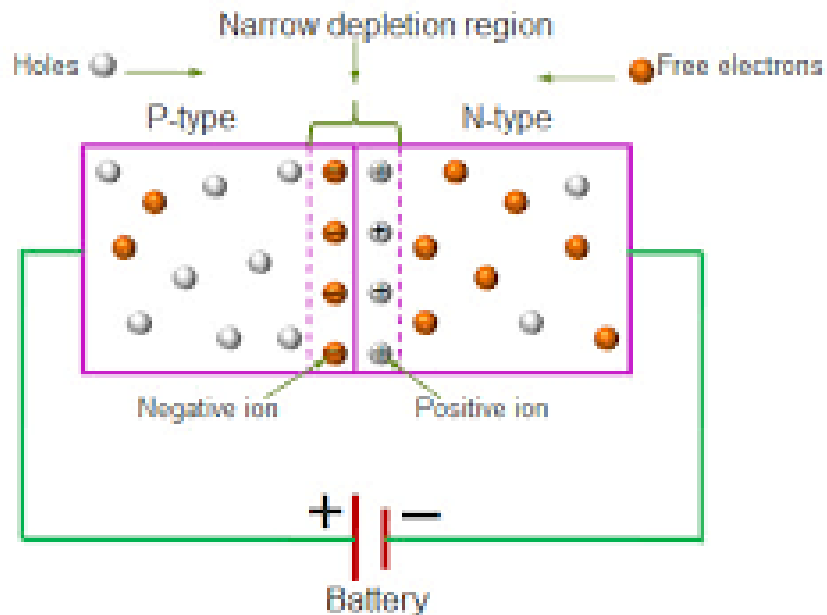


Fig. 1

Now suppose we connect a positive battery terminal to the P-type material and the corresponding negative terminal to the N-type material. This places a potential difference across the solid state device. If the battery voltage is high enough to push the charge carriers across the depletion regions then current will flow from the N-type material through the P-type material and back to the battery. In this case we say the solid state device is **forward biased** (Fig. 2).



**Forward bias**

Fig. 2

Now let's connect the positive terminal of our battery to the N-type material and the negative terminal to the P-type material as shown in Fig. 3.



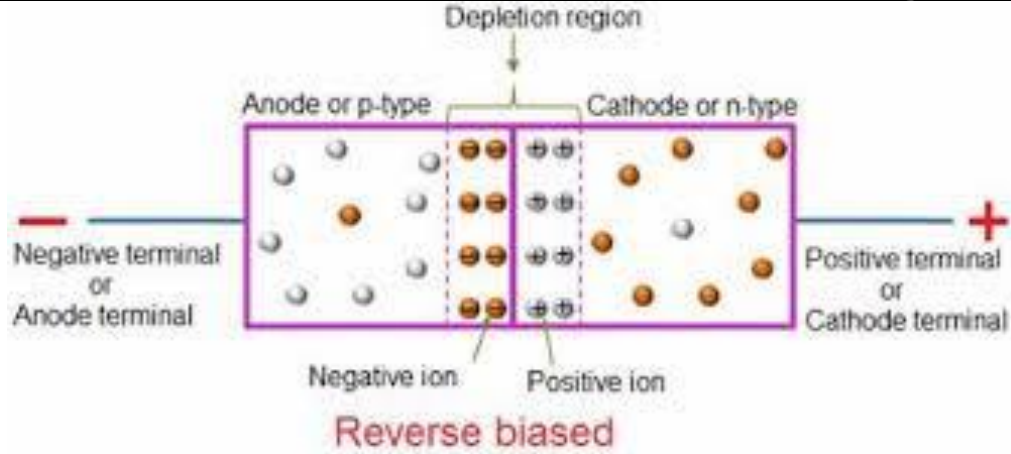


Fig. 3

The negative battery voltage repels any free electrons in the P-type material and attracts holes in the P-type material. The positive battery voltage repels holes and attracts electrons in the N-type material. This means that the depletion region gets wider because the holes and electrons are pulled away from the junction. This reduces the reverse current to a very small amount that is usually ignored. The forward current may be thousands of times larger than the reverse or leakage current.

If you will remember when we talked about diodes this was exactly the behavior we observed. That is, if the semiconductor is forward biased then current will flow; however, if it is reverse biased current does not flow. Following this discussion you see that we can represent our solid state device (diode) as shown in Fig. 4.

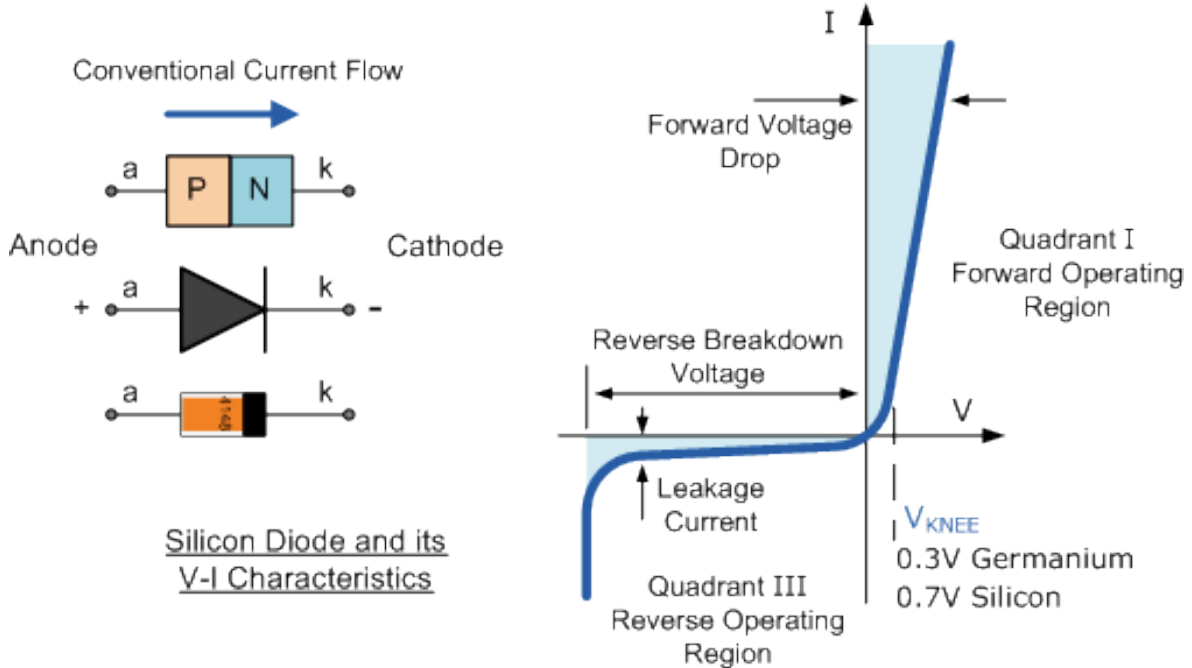


Fig. 4

Fig. 4 contains a lot of information concerning diodes. For example, the minimum voltage required to create the 'knee' of the diode is specified depending on whether Germanium or Silicon is used in the construction of the device.

One of the reasons for examining the construction of diodes is that we can use this information to open a discussion regarding the operation of basic transistors. That is, we can think of a bipolar transistor as the electrical equivalent of two diodes placed back-to-back, even though that is not the way we construct bipolar transistors. That discussion will occur in following articles.