October 2019 Volume 10-2019

Nacogdoches Amateur Radio Club

2019 CLUB OFFICERS

Pres: Jack York – KG5POU

Vice Pres: Bill Rascher – KT5TE

Sec/Treas: Army Curtis - AE5P

Visit our web site at

https://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.

SEPTEMBER MINUTES

The September meeting of the Nacogdoches Amateur Radio Club (NARC) was held as scheduled on September 4th. **President Jack KG5POU** opened the meeting at 7:00 p.m. in the Lunch Room of Christ Episcopal School. Thirteen members were present. Each person present introduced them self. Minutes of the previous meeting were approved as published. The Treasurer's report was read.

Contests: AE5P showed his certificate from this year's 13 Colonies Special Event. Army managed to work all stations in the event.

The ARRL September VHF contest is scheduled for the weekend of Sept. 14-15. A group of six club members including **AE5P, N6RH, KT5TE, W5TV, WB5IDY** and **KI5FIQ** plan to rove in the event.

The Texas QSO Party is now sponsored by the TXDXS who has changed the date from Sept. 28-29 to Sept. 14-15. Because of the conflict with the ARRL Sept. VHF Contest, it is not expected there will be any activity this year in TQP by members of NARC.

Discussion was held on ARRL NTX information sources, including the web site and groups.io email reflector. Details were published in the

September NARC Newsletter.

DETARC is planning a tailgate sale October 12 at Grace Baptist Church in Lufkin. **Chris Thomas WS5JET** presented information on the planned event and invited all to attend.

The monthly book raffle was won by **Tom W5TV**. The book for September was **"Magic Band Antennas for Ham Radio; 6 meter Antennas You Can Build" by Bruce Walker, N3JO**. As hard as Tom has been working on trying to complete his 6 meter WAS, this seemed especially appropriate.

Meeting closed at 7:53 p.m.

Program:

Army AE5P presented a program on Winlink, including a live on-air demonstration using the club's Winlink Gateway W5NAC-10. Army raffled off a Kantronics KPC3+ TNC which was won by **Steve WB5IDY**.

FROM THE PRESIDENT

"VOICES FROM THE E T-LAYER"

from CQ Magazine
January 2017

PART I RE-WRITTEN BY JACK YORK

Introduction:

The article was interesting and historic - two qualities that the NAC club enjoys. You won't believe the ending. Stay tuned!

In the article Mac, by his own account was a man busy with the needs of his family. His daughter would change the TX from normal programming to MTV. After Mac had settled back into his chair to watch, then his wife came in the room to change the TV again, to HER favorite reality show. The family wondered why he spent so much time in the HAM SHACK.

In the shack, there he would pour himself some hot coffee and enjoy where it was quiet and comfortable. It was there in the shack he would shut out the world from the chatter of busyness and focus on the chatter that made sense… the chatter of the HF world on his radio and laptop. There he would relax with other hams doing the same thing probably. In the shack Mac would sit and listen to the radio and follow with his laptop all the available contacts in the DX world. Still working on his last 35 DX contacts to complete his list, he turned to a DX spotter program , DX expedition, to see what was out there. He found three in North Africa: Ethiopia, Sudan, and Eritrea then rotated his Yagi accordingly to tune.

73 de Jack York

KG5POU

gtjakco@yahoo,com

FROM THE VP CHAIR

As October arrives I've been working non-stop to get the winter prep farm work completed. You know, the last hay baling, winter pastures in, and such. It's not that I'm trying to be timely, prepared, or want the calendar cleared for a little radio contesting. All this work is to be free enough to go to Florida for a little more diving at the end of September. The list for radio, house and farm work this fall is very long, but that will all have to done around preparing Jessica Ann Supreme for the Black Start CDT. I might even turn my radios on during the month of October. I guess it is good to be busy and having fun. My advice for everyone is to follow the example from a Clint Eastwood video; "Don't let the old man in." For me that means not to slow down and to have something you love to do each day. This fall try to get up and go outside with your radio.

73, Bill KT5TE

bill@watershipfarm.com

NOTES FROM OUR EC

26 Sep 2019: A little over 60 days until the 2019 Hurricane season is done. September, statistically the busiest storm month brought out Dorian, who tore up Bermuda, Imelda, who flooded Houston and much of the Gulf Coast and brought rains to East Texas and a few other storms. We still have a few more days so no telling what Mother Nature will bring us.

How many of you are participating in Winlink Wednesday? Follow up question, how many have the tools to do Winlink? If you are participating what are your observations, from stem to stern, especially from the newer hams? Yep, warts and all.

Winlink and NBEMS provide a way to more easily pass record traffic. So the question is, "John, what is record traffic? Anything where we may need a hard record. A tasking request, we need a bulldozer, a tasking order, we need an operator, status report, shelter population and the like. If we need a record these are some of the tools. It's far easier to build a message, fill out a form and send it. Passing a message verbally, may take a lot of time and not everyone speaks as clearly as the paid TV news talking heads. How many fills can you ask for before you throw your hands up in frustration?
If you have the equipment, get it connected and participate in Winlink Wednesday.

Don't forget our regular nets, Mondays ARES 146.84 tone 141.3, 8 pm CT and Thursdays SKYWARN 147.32 tone 8 pm CT

73 de John Chapman KC5MIB
jlchapman2@juno.com

VE TESTING

Our next VE testing is scheduled for **Wednesday October 16 at 7:00 p.m.** in the Lunch Room of Christ Episcopal Church School.

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.

More information is available on the club website at https://w5nac.com/about/testing/

73 de AE5P.

email: ae5p@arrl.net

NEW HAMS

At our VE testing session September, we had no applicants. Our group of VE's had an enjoyable social evening including a visit from Aaron KI5FIQ.

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 October 2nd at 7:00 p.m.** in the Lunch Room of Christ Episcopal Church School. A program is planned.

BOOK RAFFLE

Each month, we give away a book on a topic of interest to Amateur Radio operators. Everyone present at the meeting will receive one ticket. Additional tickets can be purchased at $1 per ticket, or 6 tickets for $5. A ticket will be drawn at the end of the meeting for the book of the month.

The book for October will be **"Dits and Dahs, the A(.-) B(-…) and C(-.-.)'s of Morse Code Operating" by Ed Tobias KR3E**. You must be present at the meeting to win.

ARRL INFORMATION

The latest news and information on the North Texas Section of the ARRL can be found at http://www.arrl.org/sections/view/north-texas and http://www.arrlntx.org/ .

It is recommended that all ARRL members in the NTX Section register at https://arrlntx.groups.io/g/section to receive email much like our own W5NAC-Hamlist email reflector. There are several sub-groups that some may want to join also for special interest topics.

If you are not yet an ARRL member, please see Army AE5P at any meeting. He always has ARRL membership applications with him. A portion of your first year's ARRL dues are donated back to the club when you join ARRL through NARC. See Army for details.

LUFKIN TAILGATE SALE

Hi this is Terry Moon W5PCJ. I'm a member of the Deep East Texas Amateur Radio Club and along with WS5JET are the event organizers for our upcoming tailgate sale on October 12th. We are looking at a time frame of roughly 8am until 2pm approximately. The address for the tailgate sale is Grace Baptist Church located at 5181 US Highway 69 N, Lufkin TX 75904. Coordinates are 31.399856, -94.792511.

We will be on property ourselves at 7:00 am to coordinate where sellers will need to park and set up. We are looking for anyone wishing to sell equipment to join us in making this tailgate sale a success. Those selling equipment will be responsible for their own snacks and drinks. We will be asking for donations to be given to Grace Baptist Church as we will be using their parking lot and it is in hopes of making this a yearly event and in ultimate hopes of this growing into an ARRL sanctioned hamfest in the future.

I will be posting this to any groups via Facebook in the East Texas area. Please tell anyone wishing to buy and or sell gear. Our talk in frequency will be the Lufkin W5IRP repeater, 146.940 negative offset with a 141.3 tone. Let's turn this into a yearly tradition for all the Hams in this corner of the state and work together to make this event a reality. Please don't hesitate to email me at w5pcj@hotmail.com or ws5jet@gmail.com with any questions.

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.hornucopia.com/contestcal/contestcal.html

Note that all dates shown here are local, CST dates while all contest logging uses UTC dates and times.

ARRL SEPT VHF

September 14-16, 2019

http://www.arrl.org/september-vhf

TEXAS QSO PARTY

Sept 14-15, 2019

http://www.txqp.net/

CQ WW RTTY

Sept 28-29

http://www.cqwwrtty.com/

TAILGATE SALE LUFKIN

Oct 12, 2019

w5pcj@hotmail.com

CQ WW SSB

Oct 26-27, 2019

https://www.cqww.com/rules.htm

ARRL SWEEPSTAKES CW

Nov 2-4, 2019

http://www.arrl.org/sweepstakes

ARRL SWEEPSTAKES SSB

Nov 16-18, 2019

http://www.arrl.org/sweepstakes

Receiver Noise

by

Thomas Atchison W5TV

We will assume that receiver noise means broadband radio interference either natural or man-made. Generally, natural noise comes mainly from atmospheric discharges which are always taking place somewhere in the world and are propagated by the ionosphere. Some natural noise also comes from outer space and is usually called galactic or cosmic noise. This latter noise sounds like white noise and is more of a 'hiss' than anything else. The remainder of the significant noise is man-made.

Noise is present in all RF circuits and it limits many aspects of the performance of receivers. Noise can enter a receiver from many sources both internally and externally. That is, noise can enter the receiver from the antenna or it can be generated by various stages of the receiver. The noise floor of a receiver provides a guide to the level of the minimum signal that can be received. Noise is always present on a radio even when no signals are present.

The noise floor is a measure of the signal created from the sum of all the noise sources and unwanted signals within a system. If we are operating on frequencies below about 30 MHz, the level of noise from the antenna may be relatively high. In this case, we do not need to have a receiver that has a remarkably low noise floor. On the other hand, if we are operating in the VHF/UHF range where the level of received noise is much lower, then a low noise radio receiver is very useful.

The sensitivity of a receiver may be defined as the minimum input signal required to produce a specified signal-to-noise ratio (SNR) at the output port of the receiver. Since noise is generally the limiting factor in this process we may use the signal to noise ratio to describe the difference in level between the signal and the noise for a given signal level. This is usually determined by the performance of the front end RF amplifier stage. Noise introduced by the first RF amplifier will be added to the signal and amplified by subsequent amplifiers in the receiver. That makes it very important to have a low noise amplifier in the first amplifier.

The signal to noise ratio is given by

$$SNR = \frac{P_{signal}}{P_{noise}},$$

where P_{signal} is the power (watts) of the signal of interest and P_{noise} is the power (watts) of the unwanted background noise.

If we want to convert the power in watts to dB we use

$$P_{signal,dB} = 10\log_{10}(P_{signal}) \text{ and } P_{noise,dB} = 10\log_{10}(P_{noise}).$$

We can then express the signal-to-noise ratio in terms of dB as

$$SNR_{dB} = 10\log_{10}(SNR) = 10\log_{10}\left(\frac{P_{signal}}{P_{noise}}\right) = 10\log_{10}(P_{signal}) - 10\log(P_{noise}).$$

This means that

$$SNR_{dB} = P_{signal,dB} - P_{noise,dB}.$$

Looking at this last equation we see that SNR_{dB} is the difference between the signal of interest in dB and the noise level in dB. For example, suppose we have an input signal from a calibrated RF signal generator of 1 uV potential difference and we measure the noise floor at -120 dBm. Since 1 uV potential difference is equivalent to -107 dBm, then

$SNR = (-107) - (-120) = 13$ dBm.

A graphical representation of this concept is shown in Fig. 1.

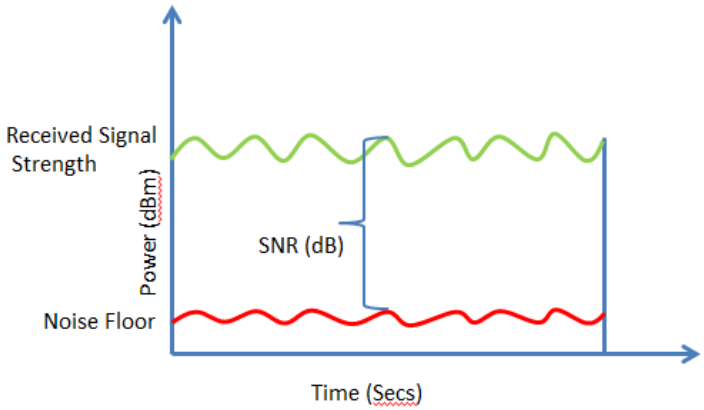


Fig. 1

When measuring signal to noise ratio there are two basic elements to the measurement. One is the noise level and the other is the signal. As a result of the way measurements are made, often the signal measurement also includes noise as well, i.e. it is a signal plus noise measurement. This is not normally too much of a problem because the signal level is assumed to be much larger than the noise. In view of this some receiver

manufacturers will specify a slightly different ratio: namely signal plus noise to noise ($\frac{S+N}{N}$).

In practice the difference between this ratio and the SNR is not large.

REPEATERS – PART THREE

by

Army Curtis AE5P

As you know, repeaters are required to receive and transmit at the same time. This can be quite a challenge.

We would like to locate our repeaters with the antenna(s) as high in the air as possible. Our local repeaters for instance have antennas that are up 270 – 300 feet. That makes for a rather long transmission line and that can result in some rather high losses. To mitigate the high losses, repeaters will often use large heliax for their transmission line. Our repeaters use 7/8" and 1-1/4" heliax to keep losses low. Your normal RG-58 or RG-213 type of coax has way too much loss to make it useable in this type of application. It is interesting to note here that the LMR types of coax are not recommended for full duplex service, as the foil shield can exhibit internal micro arcing from the transmitter power and result in noise in the receiver.

Okay, that can take care of the loss problem. But how do we manage to transmit and receive on just one antenna and one coax **at the same time?**

Several methods are available, but the most popular is the use of a duplexer. A duplexer is normally a set of tunable cavity filters that can be adjusted to provide high loss on one frequency while providing low loss on another frequency.

This is a typical '4 can' duplexer of the type used on our 2 meter repeaters. Two of the 'cans' are connected between the antenna and the receiver and are tuned to provide very high loss on the frequency of the transmitter. The other two 'cans' are connected between the antenna and the transmitter and are tuned to provide very high loss on the frequency of the receiver.

Remember that our 2 meter repeaters operate with a difference of 600 KHz between transmit and receive frequencies (the offset). A good set of duplexers will allow the radio to operate receive and transmit simultaneously with no degradation, but this comes at a rather high price. A good set of VHF duplexers will often cost close to $2,000.

So, is there another way to accomplish our goal of using our repeater 'full duplex'? Two other methods come to mind.

One is to use separate antennas for transmit and receive and locate them for maximum isolation. Locating two antennas properly spaced one directly above the other can provide a fair amount of isolation, but requires a high tower, two antennas and two sets of transmission lines. This can be rather expensive if you don't already have the needed material.

Another way is to use two separate sites, one for transmit and one for receive and provide a method to link the two sites together. This method is not normally used on 2 meters but can be common on 6 meters or 10 meters where duplexers are prohibitively large and expensive.

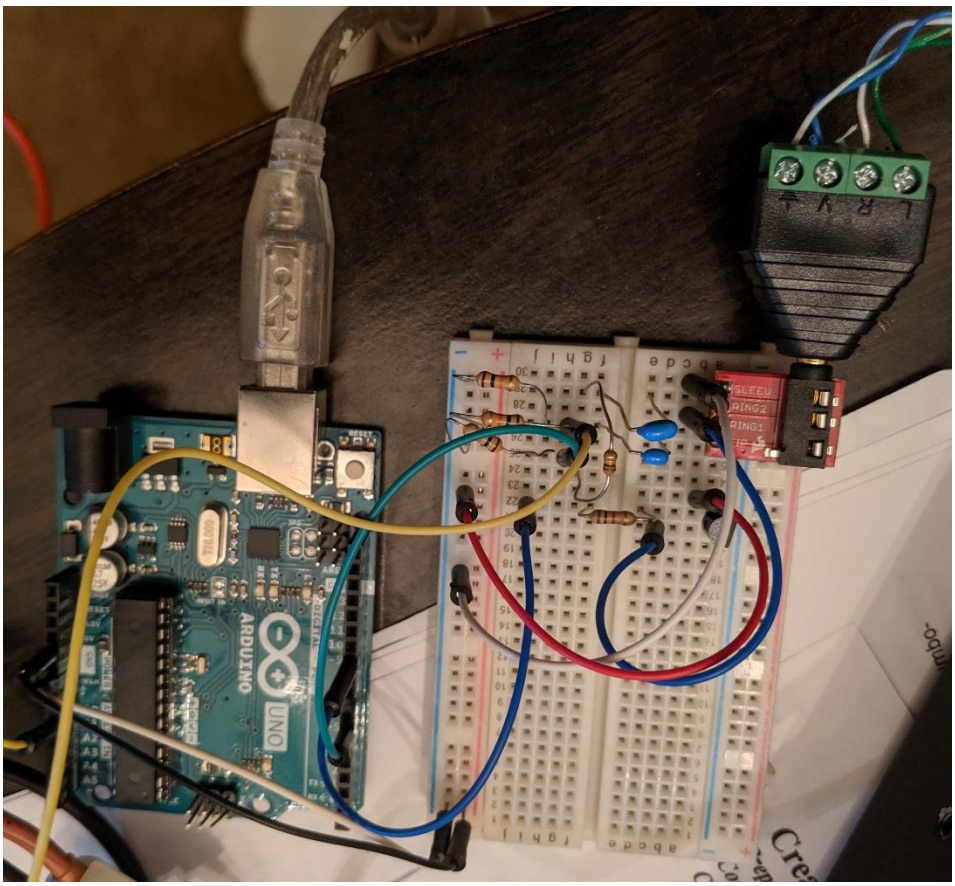
Another interesting note here is that while we have been primarily discussing 2 meter repeaters here, the duplexer for 70 cM operation is much smaller and less expensive than the VHF variety. But there always seems to be a downside. At 70 cM, transmission line losses are much higher than at VHF, increasing the importance of using the appropriate type of coax between the radio and antenna(s).

We will continue this next month. Stay tuned.

Winlink and the Homebrew TNC

by Aaron Baker KI5FIQ

After our August meeting I had the thought coming home if I could use an Arduino microcontroller board. After doing some quick Googling I found that multiple people had done it before and, thankfully, had posted their schematics online. (http://www.m0pzt.com/blog/arduino-kiss-tnc/) I had most of the parts already in stock, and after a few setbacks of ordering the ones I needed for my radio (always check the pictures before ordering, you might end up with five extra special phone jacks that you may never use). Setup on the breadboard was easy and took about 30 minutes. I was able to attempt to connect to the Winlink repeater. Unfortunately, I haven't been too successful with connecting, but the problem solving is the fun part of homebrewing anything! Once it gets going I hope to go even further and even get some sort of PCB made for it, perhaps even try the one made for the Raspberry Pi. The electronics hobbyist in me has enjoyed every ounce of this project and I hope it intrigues someone else to try it as well.



First Time Rover

by Aaron Baker KI5FIQ

The September VHF Contest was my first time doing the roving thing and I must say, that was a fun experience. It was fun driving around making contacts, missing U-turns and getting stuck in ditches (Thanks WB5IDY for rescuing me!) I've been told I've been tasked with finding new spots for when we are in Logansport, and I think I've found a few leads. But in all seriousness, I enjoyed the weekend and the food and can't wait to do it again.