

# Nacogdoches Amateur Radio Club

## 2021 CLUB OFFICERS

Pres: Bill Rascher - KT5TE

Vice Pres: Steve Bartlett-WB5IDY

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 1st. **President Bill KT5TE** opened the meeting at 7:00 p.m. in the Nacogdoches City/County Emergency Operations Center off FM 3314. Self-introductions were made by members and guests present. Minutes of the previous meeting were approved as published. The Treasurer's report was read.

**Roger KOYY** has announced that he will be moving into Assisted Living next month, and is selling most of his ham gear as well as yard and garden equipment. Roger has posted a list of items including asking prices on Hamlist.

A report on the August VE test session was made.

Discussion on several contests held since the previous meeting.

Discussion held on the upcoming ARRL September VHF contest. Several club members indicated interest in participating in a rover pack.

Upcoming contests discussed included the **Texas QSO Party** and the **CQ World Wide RTTY** contests.

Two books were raffled off,. **Steve WB5IDY** received Oscilloscopes for Radio Amateurs and **Aaron KI5FIQ** received Learning CW.

Remember: everyone present at a meeting will receive a raffle ticket at no charge. Multiple books may be raffled off. You must be present to receive a raffle ticket.

Meeting closed at 8:12 p.m.

### Show and Tell / Program:

**Army AE5P** showed off his new electric three wheel scooter which can be quickly folded up into a roll behind suitcase. It uses Lithium batteries which are approved by the FAA and TSA.

## FROM THE PRESIDENT

After a hot dry September maybe October will still continue to be warm and dry. Now, I need those conditions to bale the last 10 acres of Bahia for our barn. Unfortunately our square baler has had constant problems this year, and the one thing you can't have is a baler with problems when using a gravity based accumulator.



A solution might be to put cameras at the knotters and on the accumulator.

Maybe before next year I'll make some mounts for

a pair of cameras. Right now the only camera is on the back of the tractor facing the equipment attached. Great for dark conditions since 90% heat reduction film on the windows of the cab are too dark to see anything at dusk or even under lights.

I was talked out of using clear film all around the cab, wow, big mistake. The color of ceramic film has almost no impact on heat reduction. Just a little privacy I don't need in the middle of a hay field. Psychologically it may make you feel a little cooler, but the ceramic film also reduces radio waves. So cellular phones drop a bar or two, and unlike a car there are no windows to roll down. If you are having trouble communicating with your HT or phone in a vehicle try rolling down a window. That has worked for me during one of our VHF roving expeditions.

Parks on the air (POTA) just keeps getting better.

Since loading HamRS on all my devices I find POTA is my first go to for QSOs. It's nice to be able to talk to another person instead of clicking with a mouse. Just about every computing platform is covered by the developer. Their website is;

<https://www.hamrs.app/>

The POTA websites are <https://parksontheair.com/> and <https://pota.app/#/>

Be sure to give the three little stacked bars in the upper left hand corner of the web page a click. Lots of options... HamRS integrates this website into their application, so it is easy to get to all the information in one program.

October is a great time of year to head to a park and have little fun activating. Especially if you have built a pocket size radio like the KX1 and a cell phone. Great outdoors activity for CW

operators who have a radio like the KX3. Are you reading this K5ME? :-)

Hope to see you and everyone else at the meeting...

73, Bill KT5TE

[bill@watershipfarm.com](mailto:bill@watershipfarm.com)

## FROM THE VP CHAIR

### Tech Tips

#### What about HF Antennas?

So you passed your Technician test and are working on your General, or maybe you just got your General ticket, congrats! Either way, you probably have found a HF rig and are listening to voice communications on 10 through 80 meters. After finding a radio, you started looking for antennas to use for the lower frequencies. What is the best antenna? Well, as one Elmer told me, "**it is the one that works for you!**" In reality, you will get as many answers to that question as there are radio operators!

In your dream world, your spouse authorizes the purchase of a 100 foot tower with a series of stacked Yagi beams on a big rotator that light up Europe like you were next

door. Unfortunately, most of us don't have the funds or real estate for such an antenna farm and resolve to use a simple wire antenna. The good news is wire antennas can be very good and super economical and still let Europe know you exist.

Wire antennas can be built in your garage or purchased from a number of quality vendors. Antenna designs vary from basic Dipoles and end fed wires to interesting geometric shapes. One such antenna is a simple End Fed Half Wave (EFHW). Unlike a basic dipole that typically has equal legs with an impedance close your feed line, an end fed delivers your signal into the end of a wire where impedance is high. To match your coax impedance, it uses a 49:1 matching transformer which is mostly wire wraps around a torrid core with a small capacitor. One of the advantages of the end fed half wave antenna is that it operates at both odd and even multiples of a half wavelength making it

functional on several bands. Many EFHW wires can reach a reasonable SWR on 10 through 80 meters. Usually, an inline tuner is still helpful to finalize a good match.

By feeding at the end of the radiator instead of at a balanced center point, you can get common mode currents into the feed line which produces RF in the shack. To counter this, I suggest a choke located on the feed line near the antenna. I also have an independent ground at the feed point. Some may debate the merits of grounding an EFHW antenna and if doing so acts as a counterpoise or not. The feed line or coax can act as the other side of the antenna. Antenna theory aside, I have had very good success with a ground rod at the antenna and a quality line isolator or choke located at about 20 feet back in the feed line.

Some will say this antenna design is less than desirable, but with 100 watts and a 132' EFHW at

70 feet in the air, I have contacted over 70 countries with reasonable reports up to 9000 miles away. The antenna and choke cost less than \$200 and I can switch between all bands, 10 meters to 80 meters, at will. Maybe the 100 foot tower is in my future, but until then it **"is the one that works for me !"**

Several EFHW antennas with good reviews:

<http://www.ultimax-antennas.com/index.html>

<http://www.parelectronics.com/end-fedz.php>

Build your own:  
<http://www.arrl.org/end-fed-half-wave-antenna-kit>

73

Steve Bartlett  
WB5IDY

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## NOTES FROM OUR EC

It's official: Fall has finally arrived with the same Texas weather confusion. It's hot, not so hot, getting cool, rainy (maybe), dry or the correct answer is D all of the above

We are into the last 2 months of the 2021 hurricane season, which officially ends 30 Nov. There are 2 unused names in the primary list and 6 supplemental. Depending when the newsletter is published, those numbers may change.

Nicholas was a bust, but that's okay. The NTX ARES was very busy keeping tabs on him and keeping the ECs up to date.

I looked over the NWS hazardous weather outlook, which seemed typical of this time of year, chance of rain, thunderstorms rain, etc. No early requirement for ham radio services.

However, tornadoes and some ugly weather can always occur with the conditions are correct for it to happen. Now if we can get some gentle rain to beat this dry season.

Let's shift some gears, other preparedness things. What's in your tool box? Do you have a small tool bag to take out? Can you solder? Do you have a soldering station and the necessary materials? Can you tie a knot, more than an overhand or square knot or your shoe laces? I know some of the fishermen in the group have a good grip on that one.

Why do you ask, John?

Sometimes we have to do a little more, can you throw a couple of wires to suspend a dipole? Can you build up a coax cable or solder up a splice? I have it on good authority there may be something at the next meeting about soldering.

Think it is time to close this down. Please don't forget our regular nets. If

you don't participate at least lurk and listen, especially you new operators and get a feel for how the net operates.

**ARES Net:** Monday 8:00 pm local 146.84 (PL 141.3)

**SKYWARN Net:** Thursday 8:00 pm local 147.32 (PL 141.3)

National Hurricane Center:  
<https://www.nhc.noaa.gov/>

NWS Shreveport:  
<https://www.weather.gov/shv/>

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

## VE TESTING

The September VE session had no applicants.

Many thanks to VE's Rusty KD5GEN, Ralph N6RH, Mike AA5HH, Mike W5NXX, Robert KD5FEE and Army AE5P.

Remember that we give VE tests the third Wednesday of EVERY month. For the latest information always check the club website at:

<https://w5nac.com/ve-testing/>

73 de AE5P.

email: [ae5p@arrl.net](mailto:ae5p@arrl.net)

## TWO METER CLUB NETS

Please join us each week for the two meter nets sponsored by NARC. All stations are welcome to check into the nets.

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

Our next meeting will be Wednesday October 6th at the City/County Emergency Operations Center off FM3314. Meeting starts at 7:00; doors open at 6:30. Come early for a little socializing before the meeting.

We will have our monthly book raffle, with everyone present receiving a raffle ticket without charge. One ticket will be drawn and the winner will be given a book on a ham radio subject. There may be more than one book given away this month.

A program is planned that all should enjoy.

## 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.

### CQ WW SSB

Oct 30 - 31, 2021

<http://www.cqww.com/rules.htm>

### ARRL Sweepstakes

#### CW

Nov 6 - 7, 2021

<http://www.arrl.org/sweepstakes>

### ARRL Sweepstakes

#### SSB

Nov 20 - 21, 2021

<http://www.arrl.org/sweepstakes>

### CQ WW CW

Nov 27 - 28, 2021

<http://www.cqww.com/rules.htm>

Check out the many contests listed on the Contest Calendar link shown here. There are many State QSO parties and 'Parks-On-The-Air' events that may be just right for you. Check 'em out.

## Frequency Modulation

by

Thomas Atchison W5TV

Many of us use frequency modulation (FM) on 2 meters. I want to talk a bit about what FM is and how it works. When we push the transmit button and talk into the microphone how does the voice information get from my transmitter to a receiver so it can be understood by someone? The operational word here is modulation. The radio signal is altered (modulated) by my voice when I speak. That modulated radio signal is an electromagnetic wave that travels to the receiver through space and the receiver demodulates the signal to extract my voice from the radio signal. My voice is then routed to a speaker where it can be understood by the other person.

Frequency modulation is one way of combining a voice with a radio frequency so the above can be done. In this case, the audio signal from my voice varies the frequency of the RF signal in such a way that the information (audio signal) can be recovered at the receiving end.

When you push the microphone button to talk, your FM transmitter emits a range of several thousand hertz of different frequencies and not just the singular frequency value to which you have tuned the transceiver. The displayed frequency is a reference value called the **carrier frequency**. With FM the emitted signals will vary in frequency both higher and lower than the carrier frequency by several thousand hertz. The full range of the frequencies emitted is called the **bandwidth** of the signal. For example, suppose you tune your 2 meter FM transceiver to 146.52 MHz and you speak into the microphone. Suppose the transmitter emits signals representing the modulated audio of your voice from 146.526 MHz down to 146.514 MHz. Then the bandwidth of your signal would be **146.526-146.514=0.012MHz=12KHz**.

Specifically, frequency modulation is the encoding of information in a carrier wave by varying the instantaneous frequency of the wave. The difference between the frequency of the carrier and its center frequency is varied according to the amplitude of the audio signal as shown in Fig. 1.

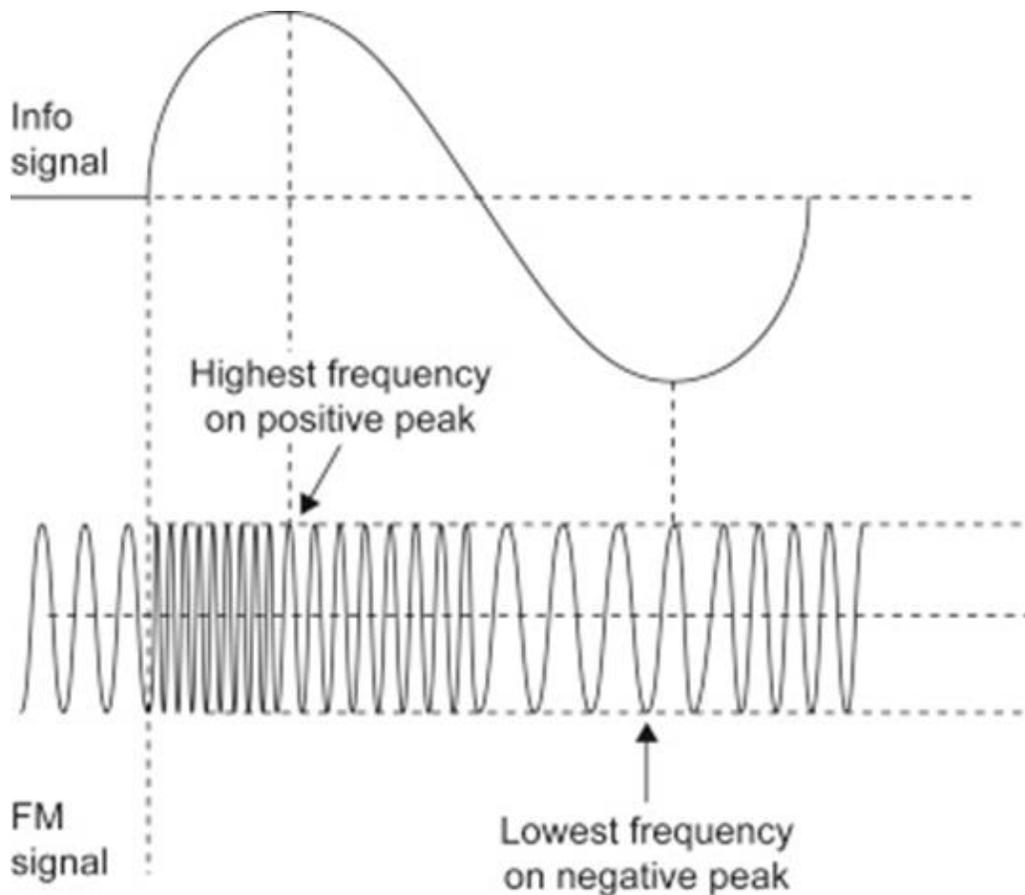


Fig. 1

**Frequency deviation** is the amount of frequency shift each side of the unmodulated carrier frequency which occurs when the transmitter is modulated. It is usually measured in kilohertz. When a symmetrical modulating signal is applied to the transmitter, equal deviation each side of the resting frequency is obtained during each cycle of the modulating signal. The total frequency range covered by the FM transmitter is sometimes called the **swing**.

Frequency deviation is important because it determines the bandwidth the FM signal will occupy in the spectrum. Less deviation means that more channels can fit into the same amount of frequency spectrum. In amateur radio we use narrowband FM with a deviation of  $\pm 5$  kHz. The channel spacing is dependent upon location. In the United States it can be 15, 20, or 30 kHz depending on the region. The  $\pm 5$  kHz means that the deviation can range from 5 kHz above the carrier frequency to 5 kHz below the carrier frequency. In this case the swing is 10 kHz.

The following diagram shows frequency modulation (FM) compared to amplitude modulation (AM) (Fig. 2).

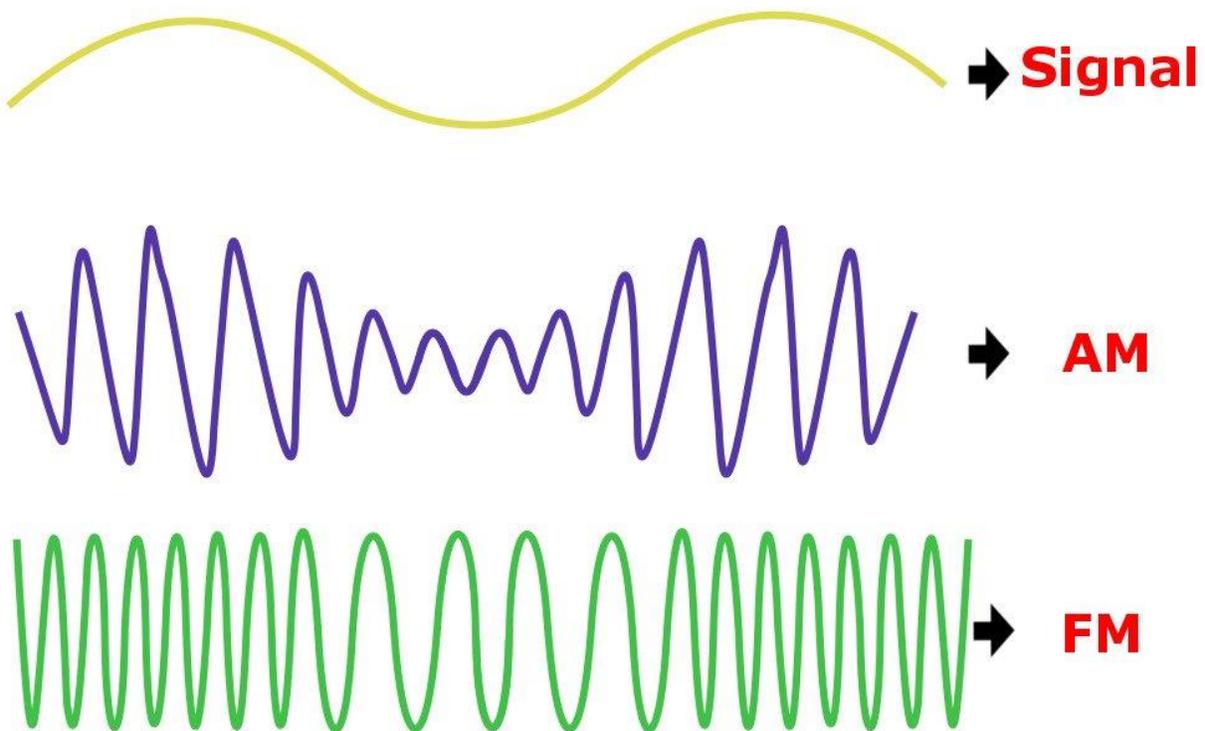


Fig. 2

The **modulation index** of an FM signal is the ratio of the deviation to the audio modulating frequency, when both are expressed in the same units.

For example, if the deviation is  $\pm 5$  kHz and the modulating frequency is 2 kHz, then the modulation index would be

$$\frac{5 \text{ kHz}}{2 \text{ kHz}} = 2.5$$

The **deviation ratio** is the ratio of the peak frequency shift obtained under full modulation to the maximum audio frequency to be transmitted. For example, if the maximum audio frequency to be transmitted is 3 kHz and the peak frequency shift is 5 kHz, then the deviation ratio would be

$$\frac{5 \text{ kHz}}{3 \text{ kHz}} = 1.67$$

The noise-suppression capabilities of FM are directly related to the deviation ratio. As the deviation ratio is increased, the noise suppression becomes better if the signal is stronger than the noise. But, as the noise approaches the signal in strength low deviation ratios allow communication to be maintained in many cases whereas high deviation ratios will not.

Since all the modulating information is carried as frequency variations and no amplitude changes are required, the signal can be passed through a limiter stage. This not only removes the major source of noise which is amplitude noise, but it also removes the major changes in signal strength resulting from mobile operation. This makes FM a good choice for mobile operation. We may talk about limiters in a later article.

## \*\*\*\*\* ANTENNA RAISING INCIDENT \*\*\*\*\*

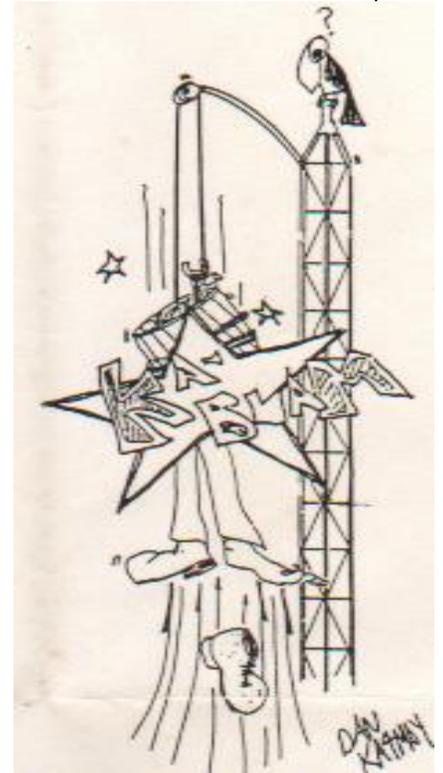
(EDITOR'S NOTE: This was found on a bulletin board in Fort Wayne, Ind. It is a ham's reply to a query from his insurance company.)

"I'm writing in response to your request for additional information for Block Number 3 of the Accident Reporting Form. I put "poor planning" as the cause for my accident. You said in your letter I should explain more fully, and I trust the following details will be sufficient."

"I am an amateur radio operator and on the day of the accident, I was working alone on the top section of my new 80' tower. When I had completed my work I discovered that I had, over the course of several trips up the tower, brought up about 300 lbs. of tools and hardware. Rather than carry the now un-needed tools and materials down by hand, I decided to lower the items down in a small barrel by using a pulley, which fortunately was attached to the gin pole at the top of the tower.

"Securing the rope at ground level, I went to the top of the tower and loaded the tools and materials into the barrel. I went back to the ground and untied the rope, holding it tightly to insure a slow descent of the 300 lbs of tools. You will note in Block Number 11 of the Accident Reporting Form that I weigh only 155 lbs."

"Due to my surprise at being jerked off the ground so suddenly, I lost my presence of mind and forgot to let go of the rope. Needless to say, I proceeded at a rather rapid rate of speed up the side of the tower. In the vicinity of the 40' level, I met the barrel coming down; this explains my



fractured skull and broken collarbone. Slowed only slightly, I continued my rapid ascent, not stopping until the fingers of my right hand were two knuckles deep into the pulley."

"Fortunately, by this time, I had regained my presence of mind and was able to hold on to the rope in spite of the pain. At approximately the same time, however, the barrel of tools hit the ground and the bottom fell out of the barrel. Devoid of the weight of the tools, the barrel now weighed approximately 20 lbs. I refer you again to my weight in Block Number 11. As you might imagine, I began a rapid descent down the side of the tower. In the vicinity of the 40' level, I met the barrel coming up; this accounts for the two fractured ankles and the lacerations on my legs and lower body."

"The encounter with the barrel slowed me enough to lessen my injuries when I fell on to the pile of tools, and fortunately only 3 vertebrae were cracked. I'm sorry to report, however, that as I lay there on the tools, in pain, unable to stand, and watching the empty barrel 80' above me, I again lost my presence of mind. I let go of the rope."