

# Nacogdoches Amateur Radio Club

## 2020 CLUB OFFICERS

Pres: Bill Rascher - KT5TE

Vice Pres: Steve Bartlett-WB5IDY

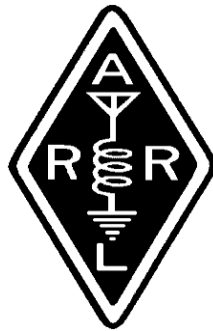
Sec/Treas: Army Curtis - AE5P

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.



## JULY MINUTES

The July meeting of the Nacogdoches Amateur Radio Club (NARC) was held as scheduled on July 1st. Because of the Wuhan virus, the meeting was again held as a virtual meeting using the club's 147.32 repeater. **President Bill KT5TE** opened the meeting at 7:00 p.m. Nine members and guests checked in. Minutes of the previous meeting were approved as published. The Treasurer's report was read.

Members were encouraged to try their hands in the many contests, even if just

for a few contacts. It's wonderful practice and a great way to improve your abilities in Ham Radio.

Recent contests included the CQ WW WPX CW contest, which is one of the best.

Field Day is scheduled for June 27-28. Members are encouraged to operate their own stations from home as a Class 1D. This year, the FD rules have been revised to allow Class D stations to make contact with other Class D stations for credit. Members who do operate during Field Day should include their association with Nacogdoches Amateur Radio Club when they send in their logs to ARRL.

Thanks to **Steve WB5IDY** for making facilities available at the North

Street Church of Christ for VE testing this month. Steve hopes we may be able to continue VE testing at that location in future months as well.

**Program: Army AE5P** presented information on Field Day operation this year. As noted previously, members are encouraged to operate from their home stations as a Class 1D entry. ARRL has modified FD rules for this year to allow Class D stations to contact other Class D stations for credit. Each member must include note of their association with Nacogdoches Amateur Radio Club when they send in their logs.

## FROM THE PRESIDENT

### In The heat of Summer

Unlike a few decades ago summers are getting tougher to keep working past lunch time. By afternoon, with a heat index over 100, who wants to sweat out their second set of dry clothes? It's more inviting to head to water (pool, pond, lake, etc) or A/C.

This year has meant limited trips to town so this is a great time to catch up on reading, darkroom projects, and of course anything with the radios. Usually there is more to read than there is time due to all the other activities and the reading piles up. So with that in mind you might enjoy reading Nuts and Volts, and to start you off how about an article about the story behind the transistor?

<https://www.nutsvolts.com/magazine/article/the-story-of-the-transistor>

How many of you remember Popular Electronics magazine or maybe the Electronic Experimenter's Handbook? Here is a link to PDFs of all the back issues of Popular Electronics;

<https://worldradiohistory.com/Popular-Electronics-Guide.htm>

And for the young kids in the crowd maybe Carl & Jerry from Popular Electronics starting in 1954?

<http://www.copperwood.com/carlandjerry.htm>

Some of the stories are in PDF format for an enjoyable quick read. With FT8 you can read and make QSOs, but don't try this with FT4. Near the bottom of the article you will find a link to print the stories at Lulu publishing. At Lulu publishing the stories are

grouped into 5 volumes from 1954 to 1964. Your kids or grand kids might find these short stories interesting, and maybe pique their interest in science & ham radio. Not a bad starting place? Read a few stories and you be the judge.

From the looks of how things are going the August club meeting will be on the 32 repeater. I'm looking forward to hearing from you at the net meeting.

73, Bill KT5TE

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## FROM THE VP CHAIR

### Fun with the sun

Nearly 30 years ago, we decided to upgrade a single room remote deer lease cabin to be "wife worthy" which would include heat, fans, lights, radio/TV, a shower with hot water, and a great outdoor kitchen. The Plan may have been one birthed around a campfire fueled by adult beverages, but a hunting group comprised of 4 Engineers and a Pharmacist would not be easily deterred. (Okay, the Pharmacist was in the group strictly for medical reasons ... ) The only problem was the nearest powerlines were a mile away and our young executive engineer salaries could not afford the cost to run poles and lines all the way into the camp. After some research, we found solar panels might be the solution.

We purchased a "large" 80 watt panel, a solar charge controller, and six golf cart batteries. We wired the cabin with 10 and 12 gauge wiring and installed lights, water pumps, a radio system, fans, and an inverter for 120v AC to run CPAPs, etc. It soon became a pretty sexy deer camp, except for the outhouse which was still not very wife worthy. Oh well, back to the campfire. Note: we also ran a gravity line from the pond 600' to the cabin and had a three stage filter and chlorination system for our wash water. Yep, Aggie Civil Engineers at work.

Today, you can purchase two 100 watt panels of higher efficiency at half the size for a lot less money. Solar controllers have also come a long way with multi-stage PWM and MPPT charging regimes. Lithium and AGC batteries have now become the standard, and last for years with almost no maintenance.

Today, I have three independent solar

systems in my boathouse on the lake. One 24v system to charge the trolling motor batteries on the pontoon boat, a second 12v system to charge the battery on the Jon boat and a third system to charge a small gel cell battery that runs a pump for the fish cleaning table, each with independent panels and charge controllers. These systems work so flawlessly, we forget that we don't have shore power at the dock. All three systems cost under \$500 total.

A solar system can be used to provide power in a remote cabin, a shed in the back yard, or simply to keep a battery charged on your trailer. We use a folding 160 watt solar panel system on our RV for dry camping. We can run everything, except for the air conditioning, off battery power, especially with the addition of LED lighting. It has a certain cool factor to boondock using mother nature as your power source, ... except during May through

September when the AC is a must. Hello Mr. Generator all night!!

All you need to get started is: a solar panel, charge controller, and a battery. Calculate the amp-hours you anticipate from your intended loads and pick a solar panel that generates at least 1.5 to 2 times the amps at peak exposure you think you will need. As the sun angle changes, the amperage generated by the panel changes thus you only average a fraction of the peak output of the panel unless you have an automated sun-following system that uses Freon tubes to turn the panel toward the sun all day. Nope, you can't afford that option. If you wish to run alternating current devices, you can get an inexpensive inverter, which delivers a square wave output but there is a notable efficiency loss in the conversion from DC to AC. Sinewave inverters are significantly more expensive and are only needed for sensitive electronic equipment. I

run televisions, radios, blenders, and fans on an inexpensive inverter all the time.

Monocrystalline solar panels are better and cost about \$1.00 per watt. Pick a charge controller that is sealed in epoxy (unless used indoors) with temperature compensation, and is in at least the mid-range price slot. The controller should be rated for more amperage than the panel/s output. I like RENOGY panels and MORNING STAR Controllers with PWM charging steps, but many quality brands exist. Either wet cell or gel deep cycle batteries are a must and may be the most expensive part of your system. Don't be tempted to use a lead-acid car battery as it is not intended for deep cycling and recharge.

Connecting the system is easy and today's charge controllers do all the heavy lifting. Even a Civil Engineer can do it. It is a fun and rewarding project, even if you only

make a small system just for emergency power.

No, I still don't hug trees

...

73, Steve WB5IDY

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[om](#)

## NOTES FROM OUR EC

It's not going to be a very long one this time around. Has everybody enjoyed the pop-up showers? As Army mentioned they're nice but the grass keeps growing.

I have been unable to keep up with Hannah and the other storms we had in July. Hannah made landfall south of Corpus Christi. According to some of my acquaintances down in the valley there is still lots of flooding and electrical services are still out in many places. If you have been down to the Rio Grande valley, from Brownsville to the north

and west, it is quite flat for a goodly distance. And no I have no idea if any ham radio assets or shelters were activated. Hopefully they can get back to some sense of normal.

A new tropical depression with a good (60%+) chance of developing into a storm or worse was located about 1000 miles east of the Windward Islands. The early plots put it into the Gulf of Mexico and again, I don't have much more than that. We will just have to wait and see what the models have to show.

COVID-19, SARS, Rona, whatever you want to call it has tagged at least one of us and a couple of other NARC members have been tested out of an abundance of caution. My only symptom was a slight fever that just cracked 100.5° the magic threshold set by the CDC. But again "out of an abundance of caution" upon reasonable medical advice I got tested and lost that contest and tested Positive. Just to allay any

worries that was my only symptom. I have since tested negative which in this case is a good thing and will test one more time before I return to work later this week (27-31 July). Robert, thanks for your offer of assistance. It was appreciated.

I hope everyone else is scrubbing up and masking up and keeping up with others that may be quarantined or self-quarantined. Keep up with any friends you have in care facilities, most remain locked down.

I think we'll close this one out. Thanks to everyone for checking into the nets. It has been refreshing to actually participate, not just listen and take the head count. Don't forget to check into our nets on Monday and Thursday. We will again have a virtual club meeting on the 5th, meeting on the 147.32 SKYWARN repeater, 7 pm.

Don't forget, sign early, sign often (just like voting in south Texas).

**ARES/RACES Net:**

Mondays 8:00 pm local time, 146.84, 141.3, neg offset.

**SKYWARN Net:**

Thursdays 8:00 pm local time. 147.32, 141.3, positive offset.

73 de John Chapman  
KC5MIB

[kc5mib@arrl.net](mailto:kc5mib@arrl.net)

**VE TESTING**

Thanks to Steve WB5IDY, we were again able to continue our VE testing on July 15<sup>th</sup>. Due to the Wuhan virus, we were forced to cancel the test sessions originally scheduled for March, April and May. Man is it ever nice to be able to resume testing. We met at the North Street Church of Christ and hope we may be able to continue there in future months.

The July VE session saw 5 candidates and produced one upgrade to Extra, one new General, and three new Techs. With offices

still closed at ARRL, it may be a few weeks before new call signs can be issued.

For the latest updates, please check the club website at:

<https://w5nac.com/about/testing/>

73 de AE5P.

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

**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 a virtual on-air meeting **Wednesday August 5th at 7:00 p.m.** on the 147.320 repeater (PL 141.3). All stations participating are asked to check-in giving their callsign and name when asked for. An on-air program is planned.

## 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.

### NAQP, CW

Aug 1, 2020

<http://www.ncjweb.com/NAQP-Rules.pdf>

### NAQP, SSB

Aug 15, 2020

<http://www.ncjweb.com/NAQP-Rules.pdf>

### ARRL ROOKIE ROUNDUP RTTY

Aug 26, 2020

<http://www.arrl.org/rookie-roundup>

### WORLD WIDE DIGI DX

Aug 29-30, 2020

<https://ww-digi.com/>

### ARRL SEPTEMBER VHF

Sept 12-13, 2020

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

### CQ WW RTTY

Sept 26-27, 2020

<http://www.cqwwrtty.com/>

### CQ WW SSB

Oct 24-25, 2020

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

### ARRL SS CW

Nov 7-9, 2020

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

### ARRL SS SSB

Nov 21-22, 2020

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

### CQ WW CW

Nov 28-29, 2020

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

## SPORADIC E PROPAGATION

by

Thomas Atchison W5TV

In the atmosphere around the earth there is a region that extends from about 50 km to over 500 km where some of the molecules of the atmosphere are ionized by radiation from the Sun. This produces an ionized gas that is referred to as the ionosphere. In the ionization process electrons are added to or removed from molecules to form negatively or positively charged ions and free electrons. The ions, of course, give this region its name.

During daylight there are usually four ionization regions present, the D, E, F1, and F2 regions. The D region is normally from 50 to 90 km, the E region from 90 to 140 km, the F1 region from 140 to 210 km and the F2 region above 210 km. The D region usually weakens the lower HF frequencies (160 m and 80 m) by absorption. Fortunately, at night, the D region almost disappears and this allows the lower frequencies to reach the higher layers and be refracted to more distant stations. The E, F1, and F2 regions, when they are present, refract HF signals depending on the radio frequency and the denseness of the ionization.

At times, more densely ionized clouds can form in the E layer. These clouds may form at any time, they may be large or small, and they may or may not persist. These are called **sporadic E layers**. The refracting ability of sporadic E layers depends on the frequency of the transmitted signal and the density of the ionization. Sometimes a sporadic E layer is transparent and allows most of the radio wave to pass through to the F layers and at other times it may refract the radio wave completely. In those cases where the refraction is not total but variable the result is fading of the radio signal. Basically, sporadic E skip is caused by patches of ionization in the E layer. It is possible that sporadic E layers can have a detrimental effect on HF signals. If the sporadic E layer has enough ionization to refract an HF signal it would prevent the HF signal from reaching the higher F layer and therefore shorten the distance that the HF signal would propagate.



The mechanism behind sporadic E is not well understood. It is thought that there may be several phenomena that could give rise to its formation. Here are some possibilities:

- **Meteors:** There is some evidence for believing that one phenomenon that gives rise to sporadic E is the entrance of meteors into the atmosphere. Typically meteors burn up in the E region, and there could be some connection.
- **Electrical storms :** These may extend high in altitude and there are electrical effects well above the clouds. It is believed these could supply energy for the formation of sporadic E clouds.
- **Auroral activity :** The occurrences of Sporadic E in the winter at night have also been linked to auroral activity. This is certainly the case for auroral sporadic E that is the result of energetic electrons entering the atmosphere from the magnetosphere.
- **Upper atmosphere winds:** Some theories suggest that shearing forces caused by the fast moving winds in the upper atmosphere may give rise to these intense clouds of ionization, particularly in temperature regions.

Sporadic E activity can occur any time, however, during the day there seem to be two main peaks of time when they occur. The first is midday and another is early evening. Sporadic E activity is usually greater in the summertime. In North America, we often experience sporadic E from June to August.

Regarding sporadic E refraction, the Maximum Useable Frequency (MUF) varies, but it is most commonly in the 25 to 150 MHz range. Communication distances range from 800 to 2200 km. The amateur bands that are most often affected are the 10 meter, 6 meter, and 2 meter bands; however, the 1.25 cm band may occasionally be affected. When sporadic E ionization clouds form, activity is normally heard in the lower part of the radio spectrum first. The MUF tends to rise depending on the level of ionization so higher frequencies begin to appear. That is, the level of ionization usually rises until it reaches a peak and then it falls away.

If you wish to pursue additional information regarding sporadic E propagation see the following URLs:

<https://www.electronics-notes.com/articles/antennas-propagation/ionospheric/sporadic-e-es.php>

[https://www.researchgate.net/publication/227207773\\_A\\_Tutorial\\_Review\\_on\\_Sporadic\\_E\\_Layers](https://www.researchgate.net/publication/227207773_A_Tutorial_Review_on_Sporadic_E_Layers)

## ON SECOND THOUGHT, I'LL TAKE THE STAIRS

By Wayne Burdick - N6KR

I have a friend about my age who got into amateur radio only a few years ago. Like many of us, he was enthusiastic about the technology. Intrigued with DX.

I showed him my station; we talked endlessly about gear. Later, I helped him put up a simple wire antenna.

Then, when his license arrived, he dove straight into FT8 and didn't look back. Within days, he'd worked all states, then DXCC. He'd bag a few rare ones over a light lunch, then pat his laptop on the back and congratulate his software app for its near-mythical ability to extract weak signals out of noise.

Within weeks, he'd mastered everything there was to know about this glorious new hobby.

Point. Click.

In this new world order, those of us who took the longer, slower path to ionospheric enlightenment -- and who still occasionally enjoy making waves by hand -- often fail to explain why.

I had failed to explain it to my friend. Even as hints of his boredom crept in, creating an opening, the best argument I'd made for trying CW was that he could do it without a computer. Coming in a weak second was the notion that CW was the original digital mode. For obvious reasons, I didn't bother with the classic argument about CW's signal-to-noise advantage over SSB.

I had all but given up.

Then, in a moment of delayed clarity, I decided on a different approach. I invited him to a weekday brunch. A bit of an escape. He willingly took the bait.

On the appointed day, arriving at his workplace, I bypassed the lobby's glistening elevators and climbed the four flights of stairs to his office. I insisted we take the stairs down, too.

"Why?" he asked. "And how'd you get up here so fast?"

I pointed out that I always chose stairs, when possible. That's why I wasn't out of breath. We hustled down, jockeying for position, and emerged on the ground floor invigorated by the effort.

"So, where are we going?" he asked. We'd been to every overrated twenty-dollar burger venue at least twice.

I replied that we'd be going someplace we'd never tried. My kitchen.

When we arrived, I put him to work chopping onions and broccoli and squeezing oranges while I whipped eggs into a froth and grated Swiss cheese. We ate our omelettes outside, in full sun and a cool breeze.

"What's for dessert?" he asked. "Isn't there a frozen yogurt place a two-minute drive from here?"

I had something else in mind. Back in the kitchen, I handed him a water bottle, then slipped on a small pack I'd prepared earlier.

We walked a mile or so through my neighborhood, admiring the houses' varied architecture, ending up (as planned) at a local park festooned with blackberry bushes. The most accessible branches had been picked clean, but with teamwork and persistence we were able to gather several large handfuls of fat, ripe berries, which we devoured on the spot.

We'd been poked and scratched but didn't care.

"Doesn't brunch usually end with champagne?" he wondered aloud, admiring his wounds.

Not this time. I pulled out two bottles of craft beer that I'd obtained from a neighbor in trade for repairing his ancient home stereo. Carlos had spent years crafting an American pilsner to die for, sweating every detail, including iconic, hand-painted labels.

My friend accepted the bottle, then tried in vain to remove the cap. Not a twist-off.

"Opener?" he said.

I handed him a small pocket knife, an antique without extra blades. He soon discovered it could not be used to remove the cap directly. He looked at me with a bemused expression, no doubt wondering what I had up my sleeve this time.

I pointed out that we were surrounded by white oaks, a species known for its hard wood. He got the message, smiled, and began hunting. Within seconds he'd collected a small fallen branch. I watched as he used the knife to fashion a few inches of it into a passable bottle opener. We popped the caps, toasted his new-found skill, and traded stories of misspent youth.

"Oh, one more thing," I said.

I pulled a KX2 out of my pack, along with two lengths of wire. Of course he knew everything there was to know about Elecraft, and me, so he wasn't surprised when I also pulled out the rig's attachable keyer paddle. We threw one wire in the closest tree and laid the other on the ground.

He didn't have to ask whether I'd brought a laptop.

We listened to CW signals up and down 20 meters, open to Europe at the time. As he tuned in each station, I copied for him using pencil and paper. He'd learned Morse code, but only at very slow speeds.

After making a contact, I set the internal keyer speed to 10 words per minute and dialed power output to zero, for practice purposes, then showed him how to use the paddle. He smiled as he got the hang of it. Sending the full alphabet was a challenge, but he got there. The KX2 decoded and displayed his letters, providing confirmation.

We'd blown through his allotted lunch break by a factor of three, so it was time to go. We coiled up the antenna wires, packed up, and walked back. As I drove him back to his employer, we made plans to get together again for a weekend hike.

I could have just dropped him off, but we went back into the lobby together. Out of habit, he stopped in front of the elevator. We watched the illuminated floor numbers flash: digital and predictable eye-candy.

"OK," he said. "I get it. This CW thing. It's slow, doesn't always work, and takes years of practice."

"Like hunting for your own food, or carving your own tools," I added.

"Or cooking from scratch. Or brewing your own beer. Or building your own radio. But you use more of your senses. Not just your eyes, but your ears. Your sense of touch."

I nodded. Listening; feeling. That was the radio I'd grown up with.

"Of course it's harder to work DX with CW than with FT8," I reminded him, playing devil's advocate.

"Is that what matters, though?" he asked, with a sideways glance.

A longer discussion for another day.

"Your call," I said.

He gripped my shoulder and smiled, then aimed a forefinger toward the elevator's glowing, ivory colored UP button, gilded in polished brass.

The path most taken. The easy way.

Point. Click.

"On second thought," he said, "I'll take the stairs."

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