November 2022 Volume 11-2022

Nacogdoches Amateur Radio Club

2022 CLUB OFFICERS

Pres: Bill Rascher – KT5TE

Vice Pres: Aaron Baker – KI5FIQ

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.

OCTOBER MINUTES

The October meeting of the Nacogdoches Amateur Radio Club (NARC) was held as scheduled on October 5th. **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 everyone present. Minutes were approved as published. Treasurer's report read.

The September OTA Challenge was won by **Aaron Baker KI5FIQ**. The Challenge was to work as many Texas Counties as possible in the Texas QSO Party. Congratulations Aaron.

The October OTA will be to make the most contacts in the CQ WWDX SSB contest 10/29 – 30. Rules for the contest are available on-line.

Meeting closed at 7:43.

Program: Army AE5P presented a program on working CW contests without knowing anything about CW. Instead, use your computer to send and receive CW for you.

FROM THE PRESIDENT

The month of October was a very busy month, and it disappeared quickly. November looks to be a busy month too with two sweepstakes contests and all. November can be a very good time to be outside with a radio. For me it usually means mixing deer hunting with the KX3/FT8 in the deer stand. Being in the stand is a nice peaceful time, but was cut short two years ago when a buck with nearly a 25" spread rack walked directly over to my stand in a straight line on the first day. He stopped 20 yards away and I had to wait for him to turn slightly to make the shot. Lauren thought I scared him to death since there wasn't a mark on him after his 30 yard run. But upon a closer look there was a tiny .30 hole on each side. The 2900+FPS ballistic tip 150gr 30-06 missed the ribs on both sides and the bullet never expanded. It took me a lot longer to setup everything in the stand than the time it took to shoot a deer. Last year I wasn't able to spend any time in the stand since we had just put a steer in the freezer. If I don't harvest anything this year I'll still have plenty of meat in the freezer since Lauren has processed plenty of her Champagne D'Argent rabbits. So this means this year I'll still go to the stand and be very picky with the deer I harvest. If I harvest anything at all. At least I will have peaceful quiet (QRM) time. It's not that my shack is noisy, but...

Hope to see you at our November 2nd meeting.

73, Bill KT5TE

bill@watershipfarm.com

FROM THE VP CHAIR

I feel like I say this every month, but can't believe the end of the month is already here. October was a busy month that I barely had time to sit down, relax, and breathe! As always, I enjoyed the Skywarn training put on by the folks at the weather service a couple of weeks ago over at the courthouse annex. There was a full house that attended, and even had a few club members there as well. My radio plans this upcoming month include to finally (hopefully) build my new portable end-fed half-wave antenna that I had bought awhile back that has been sitting on my coffee table for some time now. Anyway, enjoy your month and hope to see y'all at the meeting.

73 de Aaron Baker KI5FIQ

baker.barisax@gmail.com

NOTES FROM OUR EC

October is almost done. I guess you could say the "Holiday" season begins soon. All Hallows Eve (Halloween)Day seems to begin the season, then Thanksgiving, Christmas Eve and Christmas Day and finally New Years and all of its activities. After the season, I wonder where those little gremilins hide that take up the waist band of my pants.

I'll touch on this now and recap next Month. The 2022 Hurricane Season is nigh completed. We've been overly lucky this year seeing no hurricanes, but the drought reminds us how much we need the rain. Measured .4 inches of rain 25 Oct at the mill. More rain is anticipated over the next 10 days or so.

The Simulated Emergency Test will be completed after the newsletter is published. I will have a few thoughts when we gather for our next meeting. For this event let's keep it simple.

On a personal note, I am glad my schedule and duties will allow me to participate again with the club and work a little more as your EC.

See ya on the nets.

73 de John Chapman KC5MIB
kc5mib@arrl.net

VE TESTING

We had two applicants for the October VE test session.

Keith Thompkins from Conroe passed his Tech exam and is now KI5YNQ.

Daniel Gibbons from Texarkana passed his Tech exam and is now KI5YNR.

Congratulations to both Keith and Daniel.

Many thanks to VE's **Rusty KG5GEN, Ralph N6HR, Mike AA5HH, Mike W5NXK, Robert KD5FEE** and **Army AE5P**.

Remember that we give in-person 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

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

The next NARC meeting will be Wednesday November 2nd at the Nacogdoches City/County EOC. Meeting begins at 7:00; doors open at 6:30. Come early for socializing before the meeting. This will be election night for next year's officers, and we will be discussing how and where we hold our December meeting / Christmas Party.

We will also be discussing a possible major change to the way we hold our monthly meetings. If the club approves, we will move our business to an 'on-the-air' meeting a week or so before our 1st Wednesday meeting. The idea is to minimize business discussion at the regular meeting such that we can close the regular meeting by about 7:15, and move into a Program.

Now, assuming the club approves this change, then what topics do you folks want presented? It can be something very basic such as 'how to solder' to something much more technical such as 'arduino programming'. What would you like to see? What would you be willing to present?

Please attend and be part of the solution.

HAMLIST

Are you on Hamlist? Check it out and join at: https://w5nac.com/about/email-reflectors/

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 https://www.contestcalendar.com//contestcal.html

CQ WW SSB DX Contest
0000Z, Oct 29 to 2359Z, Oct 30, 2022
http://www.cqww.com/rules.htm

ARRL Sweepstakes – CW
2100Z, Nov 5 to 0300Z, Nov 7, 2022
http://www.arrl.org/sweepstakes

ARRL Sweepstakes – SSB
2100Z, Nov 19 to 0300Z, Nov 21, 2022
http://www.arrl.org/sweepstakes

CQ WW CW DX Contest
0000Z, Nov 26 to 2400Z, Nov 29, 2022
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.

VarAC for HF / FM Digital Chat

Jim Edmondson, N5JGE

This article will start with some perspective on the history of digital (or data) modes and then discuss the recent development of a new digital mode based on the Vara software modems in more detail. Digital modes have been used by hams in many different forms for a very long time. My working definition of a digital mode is one where the information is encoded by an electromechanical or electronic processing device before combining with RF (modulation) for transmission. At the receiver, the information is extracted from the RF (demodulation) and processed to a form understandable by the receiving operator. This excludes traditional CW which is "modulated" and "demodulated" by the operators themselves.

The first widely used digital mode was RTTY (radioteletype). This method evolved from landline teleprinters and was pioneered by the US Navy in 1922. After WWII, obsolete surplus equipment became available to ham radio operators and, in 1946, the first amateur RTTY transmission occurred on 2 meters. (Frequency-shift keying (FSK) was not authorized for amateurs on the HF bands until 1953.) The electromechanical teleprinting equipment used in early systems have been replaced today by digital signal processors, computers and digital displays. RTTY remains a very popular mode today, especially for contesting. The first RTTY contest occurred 6 months after the FCC authorized FSK on HF.

Further development of digital modes focused on reducing the bandwidth and adding error correction to make communications more efficient and robust. This resulted in many new "keyboard-to-keyboard" modes such as PSK31 based on phase-shift keying and various MFSK (multiple frequency-shift keying) modes such as Olivia, Domino, Contessa, etc. Essentially the same setup is used for all RTTY and these modes, just the software algorithms change to encode and decode the various signals.

When hearing the term digital mode, most hams today would think of FT8 (Franke & Taylor, 8-FSK modulation). FT8 is undoubtedly the most popular amateur radio operating mode currently in use. Before the development of FT8, PSK31 was the most common digital mode in amateur use. The primary reasons for FT8's popularity are its narrow bandwidth (although wider than PSK31), near automated QSO operation (this can start a lively discussion), error correction and ability to make contacts under very poor signal to noise ratio (SNR) conditions. Thus, even modest

stations and QRP operators can make contacts under conditions and over distances that would not be possible with SSB or even CW in some cases. Typical SNR sensitivities (2500 Hz bandwidth) for those modes are:

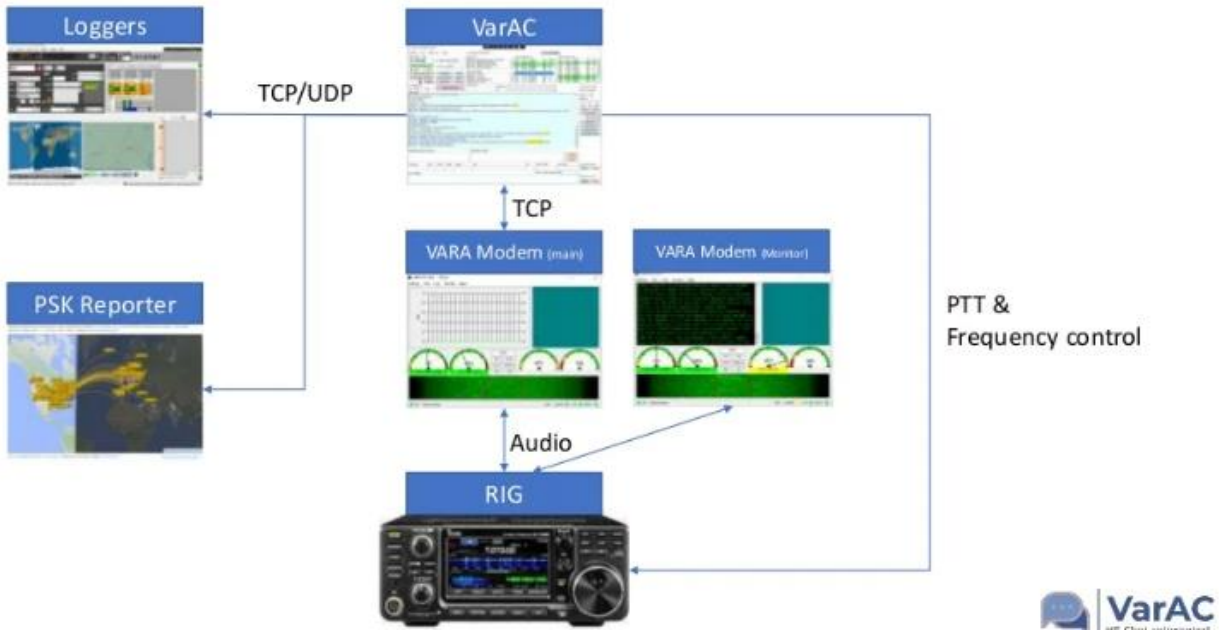
SSB	+10dB
CW	0 to -10dB typical, -15dB at best
FT8	-21 dB

The primary disadvantages of FT8 are the slow symbol rate (~5wpm), rigidly structured timing and minimalist QSO content where only callsigns, grids and signal reports are exchanged. While most previous digital modes were free-form keyboard-to-keyboard "rag-chew" modes, FT8 is not. An attempt to fix this was the development of JS8 Call which a derivative work based on the WSJT-X software. Directed calling, beaconing and message box system makes it more amenable to rag chewing and other amateur uses, but it is very slow and rigidly-timed like FT8.

VarAC is the latest digital communications mode for amateur radio. Irad Deutsch, 4Z1AC, released VarAC V1.9 Beta (the last beta version) for public use in October 2021. In exactly one year, he has released 18 updates and greatly expanded the capabilities of the application. VarAC is a point-to-point digital chat mode using the Vara software modem which provides good speed even under poor SNR conditions. Irad claims that it is ideal for QRP, portable and EmComm operations and can be used on HF, VHF, UHF and satellite (QQ-100) frequencies.

VarAC is free software that is only available for Windows operating systems (version 8.1 and above) with the .NET framework (version 4.x or above). Installation consists of creating a VarAC folder and extracting the downloaded files into it. For upgrades, you simply extract the newer Varac.exe file and copy it over the previous version in your VarAC folder. Links to the VarAC home page (with download tab) and the user manual are provided below along with an excellent presentation by Mike Richards, G4WNV, to the Radio Society of Great Britian (RSGB). There are many other internet resources to find out more about VarAC.

VarAC is the graphical user interface, CAT control and modem control software which links the Vara modem (HF or FM) and your rig. The figure below illustrates the data and audio paths for a typical HF setup.



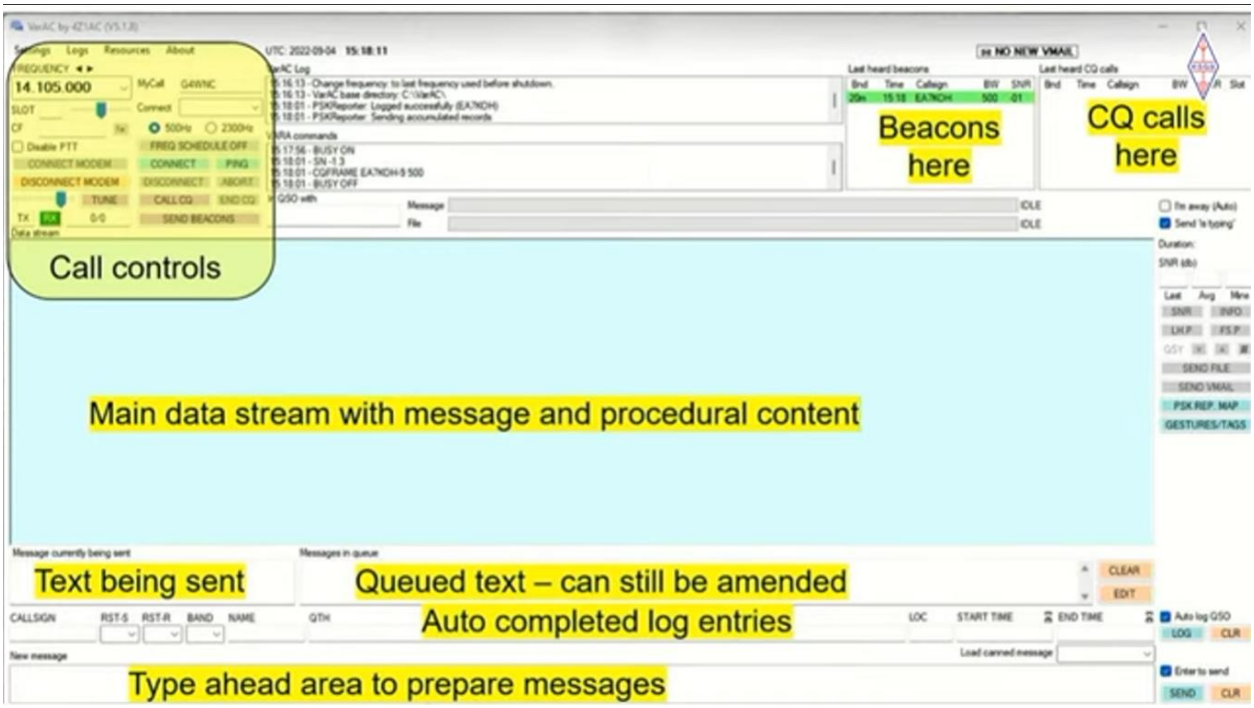
Note: Graphic is from the "VarAC Overview" presentation by Irad Deutsch, 4Z1AC and Gary Mitchelson, NC3Z linked below.

If you use Vara for Winlink Express email, you only need to install VarAC, point it to the Vara installations and establish rig CAT control to get started. The Vara modem creates an error-free connection to the other station and varies the modulation method to optimize data speed for the current SNR conditions. VarAC uses a 500 Hz bandwidth, so the free version of Vara is sufficient and that provides data speeds of 18 to 180 bps (~27 to 270 wpm) – much faster than RTTY, PSK31, FT8, JS8 Call and most other ham radio digital modes. (Keep in mind, that data rates can be slowed by the need to resend data for error correction.) Under good conditions, file transfers are also possible. As shown above, a second instance of the Vara modem can be used as a monitor to decode signals being received from QSOs that you are not a part of.

Establishing CAT control is straightforward if you have used other digital modes. An extensive list of rigs from the major and some minor manufacturers is provided by a dropdown list for both PTT and frequency control. VarAC can also use OmniRig or VOX to connect to your rig. If you have more than one rig, you can create profiles to easily start VarAC with the correct settings.

The graphical user interface is shown below. While it looks quite complicated, it is very logically laid out and easy to use with a little practice. I will describe some of

the key features, but please see the linked resources for more complete information on using VarAC.



Note: Graphic is from the "RSGB Tonight@8" presentation by Mike Richards, G4WNV linked below.

The "Call Controls" allow you to select the calling frequency for the band you want to operate on (80M through 6M built-in for HF). 20M and 40M seem to be the most used as you might expect. VarAC uses a channelized arrangement of frequency "slots" to reduce interference among ongoing QSOs. These 500 Hz wide slots are spaced 750 Hz apart with five below and 5 above the calling frequency.

When you initiate a CQ call, a popup box appears allowing you to choose among the 10 slots and calling frequency to make your call. Operators who receive your CQ call will see it in the box at the upper right corner. Along with the CQ caller's callsign are the band, time, bandwidth, SNR and slot number. Answering a CQ is as easy as double-clicking on the line in the CQ Box. VarAC automatically routes CQ replies to the correct slot without operator intervention. Right-clicking on a line in the CQ Box allows you to ping the operator, send a Vmail to them or do lookups on QRZ, PSK Reporter or in the VarAC callsign history.

Pinging allows you to make a connection to another station to exchange signal reports. This is very useful before attempting a QSO to make sure that the quality and speed of the connection will allow a good connection. Again, VarAC automatically uses the correct slot to contact the other station. Beaconing is another feature in the Call Controls area. This allows you to indicate that you are online and available for a QSO. Beacons transmit by default every 15 minutes and are automatically stopped after 24 hours. Beacons appear in the box to the right of the CQ calls. Right-clicking on a Beacon Call provides the same options listed above for CQ Calls. In both boxes, your previous contacts on the current band are unhighlighted (white in light mode or black in dark mode) your previous contacts on a different band are highlighted in orange, while potential new contacts are highlighted in green.

To conduct a QSO, either answer a CQ or double-click a callsign in the Beacon or CQ boxes. Normally a QSO will start with several "Canned Messages" which are similar to macros in other digital modes. There is a dropdown to select "Load canned message" in the bottom right of the VarAC main window just above the "New message" box. These will typically include your name, QTH, working conditions, etc. For a rag chew QSO, you type messages in the New message box. This can be done at any time during a QSO. Pressing enter in that box moves the text to the "Messages in queue" box. Messages there can still be edited until they move into the "Message currently being sent" box. VarAC alerts you when the other operator is typing a message, but this does not affect your ability to type or edit messages. One of the canned messages is usually a "73 message" used to end the QSO.

VarAC will auto-log your QSOs to several common logging programs including N3FJP, HRD and N1MM. The ADIF committee recently created new modes and sub-modes to log VarAC QSOs and you can select which mode and sub-mode you want to log under. Also, users can report the stations that they hear to PSK Reporter. This allows you to determine how well you are receiving and how well your signal is getting out. Clicking the button labelled "PSK REP MAP" opens PSK Reporter preset to show sent and received stations for your callsign over the past 6 hours on all bands.

Other features include sending and receiving "Vmail" to one or multiple recipients. This is useful for short communications where the other operator is not "on-line". The next time they open VarAC, they will be alerted to new messages in their mailbox. You can also draft messages off-line to be sent the next time that you on-line with VarAC. The system also has a relay feature. These are potential new methods for EmComm situations.

I recommend that you checkout VarAC, the newest digital mode. There is quite an active group using the 500 Hz protocol around the calling frequencies on 20M in the daytime and 40M at night. The mode can also be used on other legal amateur frequencies using either the free (170 bps) or non-speed limited (up to 7050 bps on HF), paid version of Vara. The latter would be especially useful for transferring large amounts of data.

Home | VarAC (varac-hamradio.com)

VarAC (usrfiles.com)

VarAC Overview (slideshare.net)

RSGB Tonight@8 - Back to the keyboard! by Mike Richards, G4WNC - YouTube