August 2025 Volume 08-2025

Nacogdoches Amateur Radio Club

2025 CLUB OFFICERS

Pres: Mark Phillips – KI5POH

Vice Pres: Dave Emmerling – NR5AT

Sec/Treas: Darrell Thornton – KI5PYQ

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

Dave, NR5AT, started them meeting off at 19:00. Introductions were made and minutes were approved. The treasury report was read.

Old business is 32 Controller programming. New business consisted of 13 Colonies and National Radar Coverage. Field Day results are 174 contacts. Breakout is 114 CW, 35 Phone, and 54 Digital. 43 sections were contacted. Meeting was adjourned at 19:17.

2025 DUES ARE DUE

Dues are just $20 a year and cover all licensed hams in a family. Please get your dues to KI5PYQ either in person or mailed to his home address. Sooner is better than later. Make checks payable to NARC.

SUPPORT YOUR CLUB

Are you a member of NARC? Do you check into one or more of the weekly nets on 2M? If not, why not? Do you participate in the club Fox Hunts? If not, why not? Do you participate in the club Special Events

K5C and K5T? If not, why? Let us know how we can get you involved in our club. Is there an event or program that you would like to see, let your club officers know.

FROM OUR PRESIDENT

I want to extend a big THANK YOU to everyone that helped set up, brought radios, operated the radios, provided food and snacks, spoke to the media, problem solved, packed up and everything in between! Our Field Day operation was a big success, and it would not have been possible without all of you that participated this year. Your efforts and commitment to the club are noticed.

Our next meeting will be on Tuesday, August 5th. I look forward to seeing you there.

I am thankful for each of you for being a Ham and being part of our club!

73, Mark KI5POH
KI5POH21@gmail.com

FROM OUR VP

Been on vacation in Colorado for the last two weeks. When you have been in the 70s during the day and 40s at night, it is hard to come back to Texas weather!!
Hope the summer is going well for everyone. Field Day was a success as always. Not a very big turnout this year, but the event was a success in my view nonetheless. THANK YOU to all the Field Day participants who DID show. Your efforts, help, and enthusiasm were certainly appreciated and made the day a success.
As I say, I've been out of pocket for a bit, so the radio part of my brain has been asleep, and so my article this week is brief. Jim AE5JE will be presenting a program on his antenna build at the August meeting. Jim put a lot of time, money, and effort into the system he has. Several members, including myself, were able to help Jim get his antenna up. But getting the antenna up is never the end of the project; there is a lot more to it. Jim always does a great job when giving a presentation. This should be a good one!
That's all for now. Hope to see everyone at the August meeting.

73, NR5AT
Dave Emmerling
Dke1955@duck.com

NOTES FROM OUR EC

Nothing at this time.

73 and see you on the air,
de John Chapman KC5MIB
Jlchapman2@gmail.com

VE TESTING

Larry Kinchen KJ5LKR from Crockett upgraded to General. Congratulations to Larry.

Many thanks to our VE team which this month consisted of Liaison Army AE5P, Data Entry Expert Ralph N6RH, and VE's Mike W5NXK, Mike AA5HH and Robert KD5FEE.

Our club sponsors VE testing for all classes of

of Amateur Radio licenses the third Wednesday of EVERY month at the EOC. Doors open at 6:30 and testing begins no later than 7:00.

Hope to see you at our next session on August 20. Questions? Please contact AE5P.

73 de AE5P.
email:
ae5p@suddenlink.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 20:00 on the club's 146.84 repeater (PL 141.3).

Second, on **THURSDAY** evenings at 20:00 is the **Deep East Texas Skywarn Emergency Weather Net** on the 147.32 repeater (PL 141.3).

Please join us for one or both.

HAMLIST

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

NEXT MEETING

The next regular NARC meeting will be TUESDAY August 5th at Nacogdoches EOC. Meeting begins at 19:00; Please plan to arrive early for socialization with the doors opening at 18:30.

We will have a short business meeting. The program will be hosted by Jim, AE5JE. He will be talking about his antenna build at his house.

Looking forward to seeing everyone there.

FOX HUNT

The Fox Hunts will be on hold for now. We currently do not have enough attendance to continue currently. If you would like to have another fox hunt, please let Darrell KI5PYQ or Mark KI5POH know that you would like to participate.

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
You will need to scroll to find the correct month.
Link to ARRL Contest Calendar
https://www.arrl.org/contest-calendar

Club Meeting Dates

Aug 5th 19:00
Sept 2nd 19:00
Oct 7th 19:00

Some Thoughts on Antennas and Feedlines

Jim Edmondson, AE5JE

In keeping with the antenna focus recently, here is a discussion of some antenna and feedline topics. First of all, let me make it clear that I am not an RF engineer, just an amateur radio operator. Because of that, I relied on research as well as my own experiences to write this article. I have always had a bit of a problem with calling an antenna resonant. An antenna is only resonant at one frequency. But we usually need to use antennas over a range of frequencies, so it is also important for the antenna to be "broad-banded" that is to remain close to resonance over a wide frequency range.

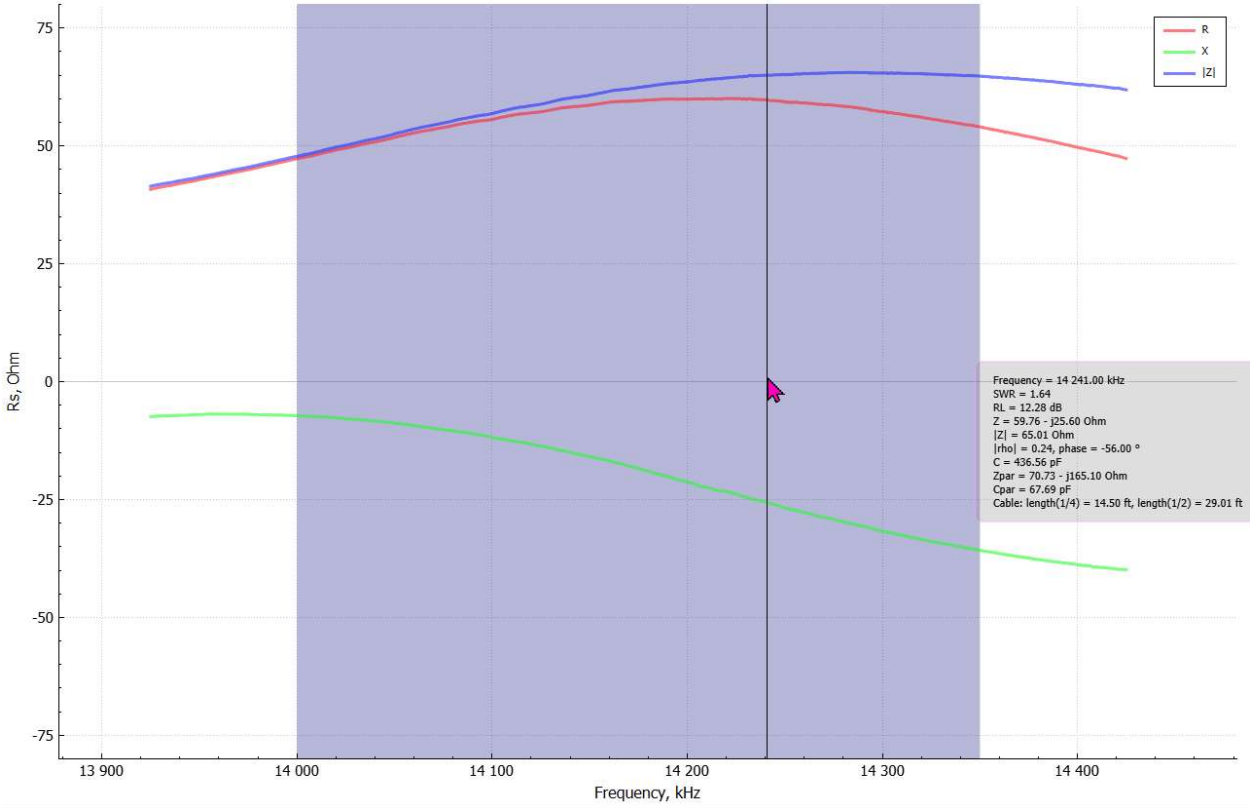
Many hams firmly believe that you must use resonant antennas and it is often stated that resonant antennas are best. The real situation is more complicated because as Dave Cassler (KE0OG) says about antennas – everything affects everything. Resonance is just one factor in antenna design / selection. Other factors may be more important depending on your use case. For example, DX'ers want a low take off angle and directionality, radiation pattern is important, some may choose to use an amplifier to compensate for losses in the antenna system, the local ham network participant may prioritize NVIS, space restrictions or HOA limits or cost may be deciding factors, etc.

What do we mean by resonance? Resonance is when the impedance of an antenna at a given frequency is purely resistive. For amateur radio, this means a 50 Ω resistance without any reactance (50 +/- 0j Ω). But what does resonance mean in a physical sense? Using a dipole as an example, for resonance, each leg is $\frac{1}{4}$ λ (wavelength) in electrical length. When the radio wave leaves and then returns to the feedpoint, it is exactly in phase with the next wave arriving from the feedline. Therefore, the energy is most efficiently transferred from the feedline to the antenna and radiated. A good analogy / explanation using a common real-world example is at this link.

If the antenna is not resonant, then some of the arriving energy is reflected back towards the transmitter. Upon reaching the transmitter, it is reflected back to the antenna over and over. So, in effect, all of the energy should be radiated by the antenna eventually. However, this is not the case due to losses in the transmission line which convert some of the reflected energy to heat. This means

that low quality of the coax and poor SWR can compound one another and lead to lower efficiency. As I will show later, high quality coax can go a long way to reduce total losses even with a poorly matched antenna system. An excellent article that discusses these factors in greater details can be found here.

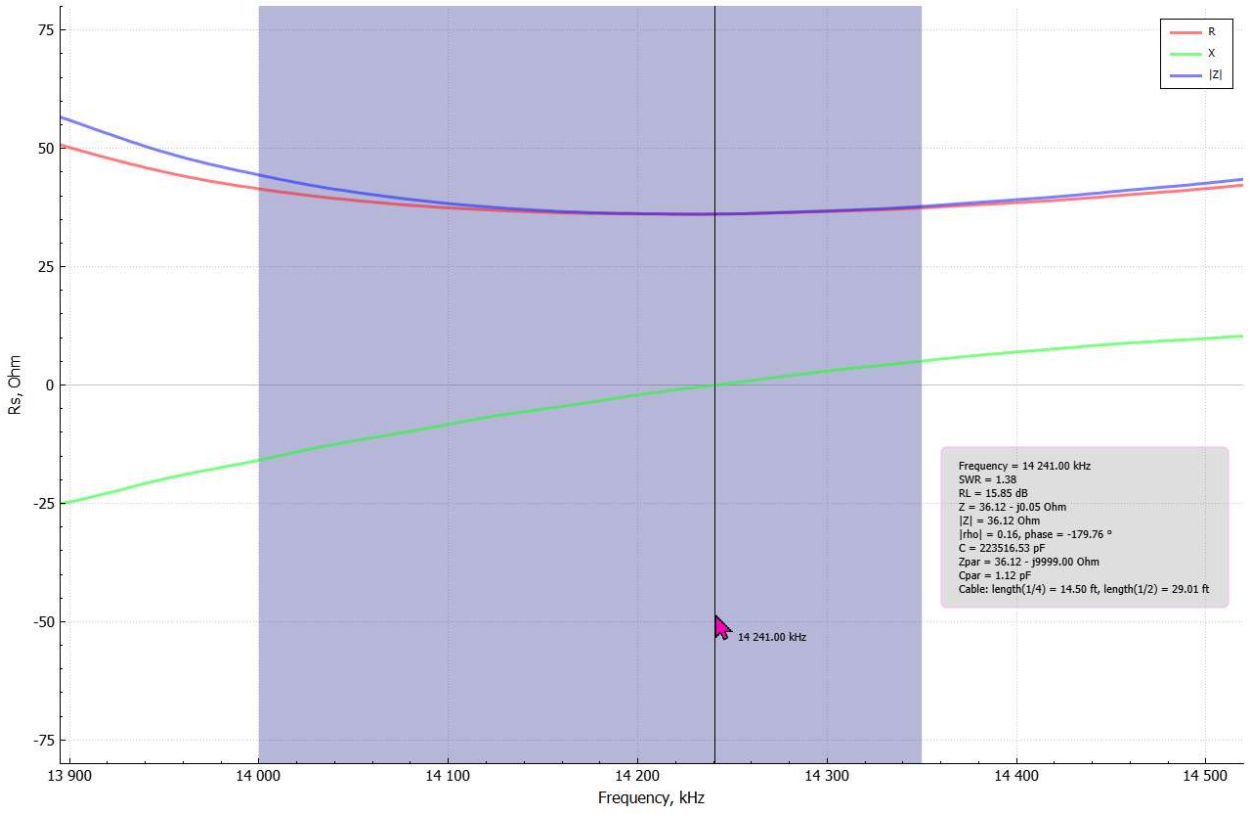
Most hams build or buy an antenna and then tune it for minimum SWR at the end of a run of coax in the band(s) of interest. This is not the same as tuning for resonance at the antenna. As an example of a non-resonant antenna with good SWR, consider my 80M Horizontal Skyloop (see QST articles in November 1985, April 2002 and August 2002). This is a multi-band wire antenna. It is a made using with wire that is a full-wavelength long for the lowest band. An 80M Skyloop is about 272' long and fed with 450 or 600 Ω ladder line. A 4:1 balun is needed since the feedpoint impedance is about 200 Ω. The minimum SWR for this antenna in the 20M band is 1.17:1 (measured at the transmitter end of the feed line). The impedance, resistance and reactance for the 20M band are shown in the figure below. The reactance is negative (capacitive) across the entire band, so resonance does not occur. There are resonance points in the 80M and 40M bands, but not most other bands.



My example "resonant" antenna is a LPDA (Log Periodic Dipole Array). This is a series of tubular aluminum dipoles mounted on an 18' boom. The elements increase in length and spacing moving away from the feedpoint to create the characteristic

trapezoidal shape. The feedpoint is a 4:1 balun and element phasing alternates. This arrangement allows low-SWR (<2:1) operation from 13 MHz to 32 MHz. The LPDA is, in effect, a "variable 3-element Yagi". The minimum SWR for this antenna in the 20M band is 1.37:1 (at the transmitter end of the feedline). The impedance, resistance and reactance for the 20M are shown in the figure below. The reactance is initially negative, but turns inductive (crosses X-axis) at about 14.241 MHz – the resonance point. Note that the impedance (Z) equals the resistance (R) at that point.

These measurements are easily made by various antenna analyzers at the transceiver end of the feedline. These measurements do not tell us about properties at the antenna or losses in the antenna system. For that there are various online or standalone calculators. I have found an application called HRC31 that is very powerful for this use (see the July/August 2025 issue of QEX). There is also an online calculator which is somewhat easier to use, but has less features. The online calculator requires you to know the SWR at the antenna feedpoint, so get ready to climb! The two calculators agreed quite well for the few points that I checked.



Using HRC31 for the Skyloop with 600 Ω ladder line and transmitted power of 100W shows that the power delivered to the antenna will be 94.8W (0.23 dB loss). Since this is fed with ladder line, the SWR at the antenna is very high (12.7:1)

compared to at the transmitter (1.17:1), but the 50' of ladder line is virtually lossless, so the high SWR does not matter. For the LPDA with ½" heliax, the power delivered to the antenna is 91.6W (0.38 dB loss). Most of the loss is due to losses in the 150' of heliax. The SWR at the antenna is 1.43:1 and essentially the same as at the transmitter (1.37:1). With these very different antenna systems, virtually identical power is delivered to the antennas. However, most of the loss occurs at the feedpoint in the case of the loop (SWR Loss) and in the heliax in the case of the LPDA (Matched Loss).

Another very useful feature of these calculators is comparing the performance of the antenna system with various types of feed line. Using the LPDA example at resonance (14.241 MHz, R = 36.1 Ω, I compared several types of coax as shown in the table below. A few points can be made from the results: 1.) in all cases the bulk of the power loss is due to losses in the coax (Matched Loss) and not SWR Loss; 2.) using LMR-400 or heliax improves power transfer greatly over RG-8X

Coax Type (150')	SWR @ Ant., x.xx:1	Matched Loss, dB	SWR Loss, dB	Total Loss, dB	Power@Ant., W	Power Increase, % (dB)
RG-8X	1.62	1.61	0.13	1.74	66.96	N/A
LMR-400	1.47	0.71	0.05	0.76	83.97	25.4 (1.0)
1/2" Heliax	1.43	0.36	0.02	0.38	91.62	37.3 (1.4)
7/8" Heliax	1.41	0.20	0.01	0.21	95.36	42.4 (1.5)

even in the 20M band.

While these results for the various feed lines are not that surprising, it is helpful to see the magnitudes of the differences. It is also interesting to note that used heliax from communication tower demolition or refurbishment is readily available at hamfests. I was able to procure ½" heliax for my tower project and 7/8" heliax for the DETARC Alto tower project for less than the cost of new LMR-400 equivalent coax.

What about non-resonant conditions? In the table below, I used a 100W transmitter, 150' of LMR-400 and 14.241MHz and varied the resistance and impedance measured at the transmitter to see how the SWR at the antenna and the power losses changed. Going from a transmitter SWR of 1.00:1 to 2.62:1 only reduced the power delivered to the antenna by 11.6% or 0.54 dB. These power losses are quite small compared to the losses when varying the type of feed line as discussed above (~25 – 42%).

Doing calculations like this has resulted in me stressing much less about my SWR and led me to increase the quality of my feed lines whenever I can. I recently added an Telepost LP-100A, a vector wattmeter to the shack. This is essentially highly accurate NanoVNA with NIST traceable calibration that can take full legal limit. It measures and displays forward and reflected power, SWR, resistance and reactance at the output of the transmitter (or amplifier). I mainly use it to monitor forward and reflected power.

While I am not that concerned with SWR for my antennas when used on the correct band, I have been known to accidentally transmit into the wrong antenna and create an excessive SWR situation. The LP-100A provides visual and sonic alarms at your chosen SWR value. If you route your amplifier keying line through it, it also prevents keying the amplifier upon alarm, possibly averting a damage to the amplifier due to high reflected power levels. This is great for amplifiers that do not have built-in protection circuits and adds another layer of protection for those that do.

At Transmitter, Ω (SWR)	SWR at Ant., x.xx:1	Matched Loss, dB	SWR Loss, dB	Total Loss, dB	Power at Ant., W
50-j0.01 (1.00:1)	1.00	0.72	0.00	0.72	84.78
50-j05 (1.11:1)	1.13	0.72	0.00	0.72	84.70
50-j15 (1.35:1)	1.43	0.72	0.04	0.76	84.03
50-j25 (1.64:1)	1.82	0.72	0.11	0.83	82.64
75-j25 (1.77:1)	2.01	0.72	0.15	0.87	81.89
100-j0 (2.00:1)	2.37	0.72	0.24	0.96	80.31
25-j25 (2.62:1)	3.59	0.72	0.54	1.26	74.94