



North Fulton Amateur Radio League NFARL eNEWS

Over 43 Years Promoting
Service | Friendship | Education | Fun

February 2025

The World of CW today

Our meeting Tuesday evening will answer all your questions about CW and Morse Code today and in the future, and the fun and opportunities available. We will cover terminology that is often misused.

We will warn against trying to learn on your own unless certain guidelines are followed.

This will also be a quasi workshop meeting. We will have keys of different types set up to explain what they are.

Bring your own key or CW related device for show and tell or to find out about it, get it adjusted, etc.

Hopefully, after this meeting, you will have a much better grasp of what is going on in the world of CW today.

Join us in person at Preston Ridge Community Center!

NFARL Club Meeting

February 18th, 7:30p to 9:00p
(doors open 7:00p)

Preston Ridge Community Center [Zoom link](#)

3655 Preston Ridge Road

Suite 100

Alpharetta, GA 30005

Meeting ID: 862 5582 7457

Passcode: 584698

<https://us06web.zoom.us/j/86255827457?pwd=a1FHR3F1bDBqMUUyY3plMDdFa2VMQT09>

Well, the groundhog may have predicted six more weeks until Spring, but we're not waiting around. We've already begun working on the club activities known for lifting us out of the winter season. Here come two anticipated events Georgia Hams enjoy; the Georgia QSO Party and Georgia State Parks on the Air. Look for information on both activities in our revised website home page.

I would like to take this opportunity to thank those members who have responded to the recent 2025 Operating Plan survey. This is a significant opportunity for members to provide input into the annual operating plan development. If you, as a club member, haven't responded, I hope you're able to do so before the February 28, 2025 deadline. Early response so far has been beneficial in providing feedback we need to ensure the operating plan reflects club member interests.

Speaking of planning, we've already begun looking into options for license and skill training sessions and events. Two years ago we successfully utilized the curriculum from Ham Radio School for a Technician license kids camp at the Computer Museum of America. This is one of the learning tools we're evaluating for use in some club based events. More to come as we further develop plans around education and training strategies.

If you haven't noticed them, we've been making subtle modifications to our website. Roy, KQ4OYM, has been guiding us through some tweaks that we believe will make information in the website more accessible and easier to read, as well as helping the team keep the website up to date. I invite you to take a look at the site and provide feedback to Tony, Roy and the Leadership Team on things you think might be helpful to optimize user and visitor experiences in the site.

Another behind the scenes activity taking place is evaluation of methods we use to communicate during club meetings and how we share the recorded videos. A small team (Lee N4WYE, Roy Kq4OYM, Dave KO4USA, and Steve KS4KJ) have tested some different recording equipment to help simplify the process for video creation. We're not done with this work, by any means, so you'll see some 'experimentation' during upcoming meetings. Parts of this work also involve the video conferencing means we use to share the meeting, so stand by for the experiences and opportunities to provide feedback.

Along with the video technique experiments, we made good progress with our transition to utilization of the new NFARL.org Google Workspace. Google offers this enterprise level platform at no expense to non-profit (i.e., 501(c)(3)) organizations. The Workspace platform is going to help us simplify communication and manage our catalogue of intellectual information. You'll hear more about how individual club members will be able to interact with this information platform over the coming year.

Finally, please feel free to contact me directly, or any other club Leadership Team member with any questions or feedback. We appreciate your interest and participation in the club!

73, Mike KN4OAK

Congratulations VE Candidates!

Wes Lamboley, W3WL

This month the weather didn't cause us any issues with the VE Testing! We're glad about that!

We had candidates who were scheduled in January join the test panel. Three candidates successfully passed their exams and are listed below. Please congratulate these folks when you next meet them!

Dondi is already a club member. He successfully passed his General.

Doug lives in Roswell and we hope he takes advantage of his free 1 year membership offer from us. Doug recently retired and is interested in being capable of radio communication when the grid isn't capable.

Renee lives in Marietta. Renee was licensed previously, but let her license lapse given life's other priorities. She's back now! You may have met Renee at Hungry Hams. Regardless, please congratulate Renee when you meet her. You'll see more of Renee as she is planning to join in on our website team.

Once again, we pass our thanks to the VE Team for their support and efforts in conducting the testing event. Our thanks also goes to Slope's BBQ for allowing us the use of their restaurant seating areas in order to conduct the test session.

<u>Candidate Name</u>	<u>Call (if applicable)</u>	<u>Test</u>
Renee Taylor		Technician
Dondi Ballard	KM4BIT	General
Doug King		Technician

Thanks from the ARRL Foundation

Wes Lambole, W3WL

John Tramontanis, N4TOL, happened to be traveling to Connecticut in January 2025. So, Wes W3WL, being the intelligent gent that he is, took the opportunity to ask John to stop by ARRL Headquarters and deliver a check to them. The check was our donation to the ARRL NFARL Scholarship. Thanks John, for performing this important service!



ARRL FOUNDATION

Administering Programs to Support the Amateur Radio Community

January 21, 2025

North Fulton Amateur Radio League
c/o Wes Lambole, W3WL
PO Box 1741
Roswell, GA 30077

Dear Friends,

On behalf of the ARRL Foundation, thank you so much for your donation of \$4,000 to support the North Fulton ARL Scholarship. I enjoyed my time with John Tramontanis, N4TOL, here at Headquarters.

Your generosity will strengthen the ARRL Foundation's ability to provide scholarships to young radio amateurs who are pursuing higher education and grants to organizations that promote Amateur Radio.

Thank you again for your generosity.

73,

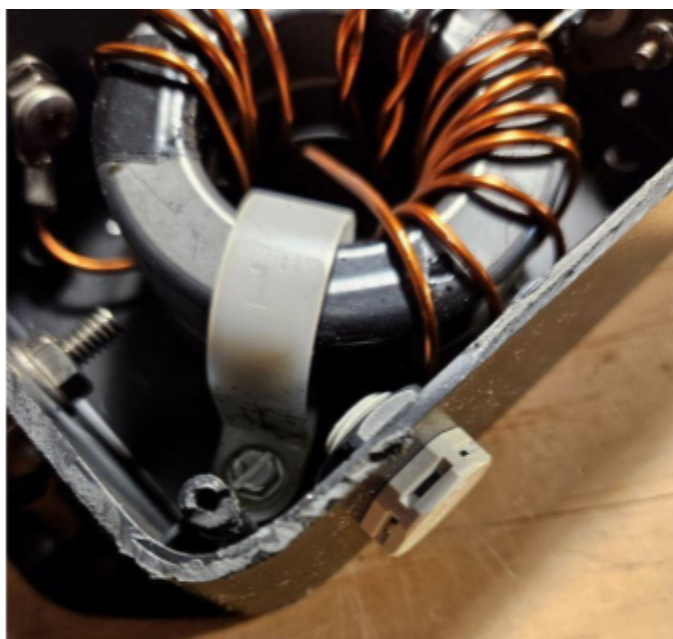
Christina Lessard, KC1TDM
Secretary
ARRL Foundation

The ARRL Foundation is an IRS-designated 501(c)(3) organization holding federal tax identification # 23-7325472. Accordingly, your contribution may be tax deductible to the extent allowed by law. No goods or services have been provided for this contribution.

ARRL Foundation ♦ 225 Main Street, Newington, CT 06111-1400 ♦ 860-594-0200 ♦ foundation@arrl.org ♦ arrl.org/arrlf

Enclosure Vents

I purchased an end-fed-half-wave (EFHW) antenna recently. Per the manufacturer, the antenna provides all-band HF coverage (80 through 10 meters) and can handle 1 KW ICAS of power. The antenna consists of 134 feet of wire, a loading coil and a matching box. The matching box contains a 49:1 ferrite matching transformer and a small trim capacitor. The capacitor is there to keep the SWR low above 14 MHz.



The matching box also has a light gray knob-like appendage I did not immediately recognize (Figure 1). I have no complaints about the product. “Magic smoke” did come out of the matching box not long after I put it on the air, but depending on one's viewpoint I'm responsible for that.

In true ham spirit, I saw the smoke-generating failure as an opportunity to look inside. Figures 1 and 2 show the outside and inside of the 49:1 transformer box. Not shown is what was left of the trim capacitor. I fried the trim capacitor (150 pF, 3 KV) while running FT8 on 10 meters with 100 watts and a 4:1 SWR. Also not shown are the two 1/8th inch drain holes I was glad to discover in the bottom of the box.

In my Around the Shack column of March, 2019, I offered a suggestion regarding sealing outdoor enclosures. My advice then was as it is now – don't try to seal them. The humidity trapped inside sealed boxes eventually condenses into liquid water. Corrosion follows. Do what the power, telephone and CATV companies do – leave the bottom of enclosures open. If you can't or won't leave the bottom open, then provide drain holes.

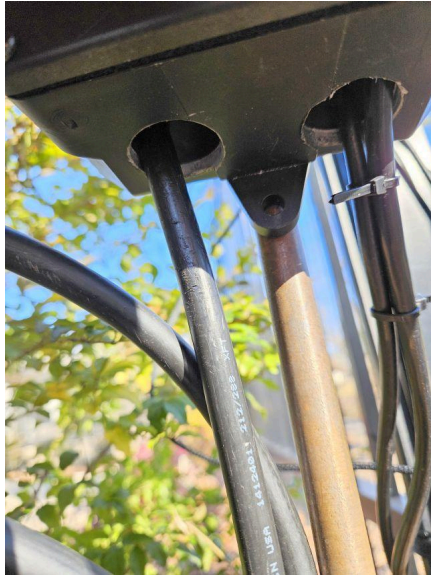


Figure 3 shows the bottom of a 4 X 4 inch NEMA box in use at N4GG to house a coax splice. Note the holes at the bottom are large enough for a PL-259 to easily pass through.

The source of water condensate in sealed boxes is humidity, but it's temperature and pressure fluctuations that cause condensation. A drop in pressure lowers the dew point, which promotes condensation on cooler components and surfaces inside the box.

The diurnal cycle and heat from internal electronics change the temperature and the pressure inside a sealed box. Cold rain from a summer thunderstorm will cause a sudden pressure drop inside a sealed box – a recipe for condensation.

Something I failed to consider when writing in 2019 was the potential need for, and/or value from “venting” in addition to “draining.” Vents can serve two purposes - equalizing pressure, and providing a path for convective cooling. An open bottom or drain holes will keep the pressure inside a box equal to the pressure outside the box, but depending on the size of the opening or holes, it may not provide much opportunity for air circulation. The two small holes at the bottom of my EFHW matching box provide an exit path for condensate and they will prevent a pressure differential, but they provide no opportunity for air circulation.

So, what is that thing shown in Figure 1? It's a “Pressure Relief Vent” made by Amphenol. Amphenol has an extensive product line of these things. Some are plastic, some are made from stainless steel. There are large ones and small ones, cheap ones and expensive ones. Consistent with Amphenol's heritage of high-quality products, their pressure relief vents are fully specified. The key specification is the air volume that will move through the device as a function of differential pressure.

Prior to my EFHW antenna acquisition, I'd not seen a small pressure relief vent – they seldom appear in ham radio. Despite that, it turns out the market for pressure relief vents is booming. Much of the demand is coming from the EV car industry. Li-ion battery packs have to “breathe” while remaining “sealed” against water and contaminant ingress. If you are driving an EV, one or more pressure relief vents are with you in your vehicle. Another place these devices are in widespread use is in landscape-lighting boxes.

Small pressure relief vents such as the one on my EFHW box are surprisingly high-tech and surprisingly low cost. The “secret sauce” in the device is a membrane that is both hydrophobic (water resistant) and oleophobic (oil resistant). The devices “breathe” in both directions while preventing ingress of water, oil, or contaminants.



The Amphenol part on my EFHW box (Figure 4) is available from DigiKey for \$2.30 in quantities of one. An equivalent to the Amphenol part (Figure 5) is available from a no-name company on Amazon - search for "4 Pcs Blue Breather Plug." They cost \$8.99 for four. Amazon Prime will deliver them in two days. The advertising copy says: "...keep product enclosures pressure balanced and avoid condensation." Bud Industries – the makers of the "Bud boxes" hams have used for decades also make a line of these devices.

Okay, now back to my EFHW matching box. The one with smoke coming out of the drain holes at the bottom. The drain holes are fine. They keep the pressure inside the box equal to the pressure outside, and they will drain any condensate that might occur. The Amphenol pressure relief vent near the top of the box adds nothing other than a small cost. Pressure relief vents don't "breathe" without a significant pressure differential and there is none in a box with holes at the bottom. The box itself is made of polycarbonate. Polycarbonate has low thermal conductivity – not much heat will move through the walls of the box to the outside. Let's be clear – my EFHW matching box is an oven. What it needs is internal convective cooling and it doesn't have any.

The 49:1 matching transformers used in EFHW antennas dissipate a lot of power. They get hot! That's lost power – power we wish was moving through the ferrite core and out to the antenna. Typically, temperature rise is the limiting factor in EFHW matching transformers – not flux density in the core(s) used. Stacking two or more cores is a common approach to building higher power transformers, but that's being done to spread the heat, not to reduce flux density or improve the transformer's thermal efficiency. What EFHW matching transformers and their enclosures need is thermal management – a subject I haven't seen discussed nor addressed in a practical way.

The design and construction of thermally efficient transformers and enclosures deserves its own column. Suffice it to say there is room for improvement in the current state-of-the-art. One valuable step in the right direction is to incorporate convective cooling, and that's easy to achieve. With holes at the bottom, what's needed is one or more holes at the top.



Just as there are a variety of pressure relief vents for sale, there are a variety of vents that pass air straight through to choose from. Bud makes a series of these (Figure 6). My plan at N4GG is to replace the Amphenol pressure relief vent with a Bud pass-through vent, then run some tests. Like most things these days, the Bud vents are available from Amazon.

An alternative would be to simply drill holes in the top of the box and fashion a rain hat. How to build, enclose and heat-sink a better transformer may be the subject of a future column.

73,

Hal N4GG

Post-Script

I didn't think it appropriate to identify the manufacturer of my EFHW antenna since despite my discouragement at the lack of robustness of the product, the design and build-quality are fully consistent with current best-practice. The manufacturer used quality materials. Even the pressure relief vent is an Amphenol rather than a Chinese knock-off. The build-quality is first-class. I don't think you can buy a better one. It would be wrong to avoid buying the one I bought given that every EFHW currently for sale with a "1 KW ICAS" rating (or something similar) will fail at 100 watts on 28 MHz into a 4:1 SWR running FT8.

I had difficulty keeping this month's column to a single subject, which turned out to be enclosure venting. There is so much more to say. The power handling ability of EFHW matching transformers is a complex subject. The capability is directly dependent on SWR yet manufacturers and technical articles rarely mention this. The "I" in ICAS stands for intermittent, but, as I've written before, what does intermittent mean? The FT8 transmit duty cycle is 42.1%, yet the EFHW community usually defines it as 100% given the transmitter is key-down for 12.64 seconds at a time. This underscores the inability of current designs to remove heat fast enough.

If you would like to get a fuller appreciation of EFHW power capabilities, I'd like to suggest reading some prior Around the Shack (ATS) columns and Ham Radio Tips and Tales (HRT&T) book chapters:

End-Fed Half-Wavelength Antennas	ATS March, 2018	HRT&T Chapter 3
Watertight Enclosures	ATS March, 2019	HRT&T Chapter 14
QRO Considerations	ATS April, 2019	HRT&T Chapter 15

CCS, ICAS and Coaxial Cable Ratings

ATS July, 2020

HRT&T Chapter 31

High power antenna tuners

ATS Nov, 2023

73,

Hal N4GG

New info for Technicians and Generals and a refresher for Extra Class Licensees!



E4D01: What is meant by the blocking dynamic range of a receiver?

- A. The difference in dB between the noise floor and the level of an incoming signal that will cause 1 dB of gain compression
- B. The minimum difference in dB between the levels of two FM signals that will cause one signal to block the other
- C. The difference in dB between the noise floor and the third-order intercept point
- D. The minimum difference in dB between two signals which produce third-order intermodulation products greater than the noise floor

See answer on the last page!

The new Amateur Extra-class license examination question pool, effective from July 1, 2024, through June 30, 2028, has been released and is available at the National Conference of Volunteer Coordinators (NCVEC) [website](#).

Note the new Technician class license examination question pool is effective July 1, 2022.

Ian, NV4C, and his team hold license test sessions on the second Saturday of each month.

For more information including upcoming test dates, [click here](#).

Contest Corner

These are some contests and events scheduled to occur in the near future.

Contest	Time & Date
South Carolina QSO Party	1500Z, Feb 22 to 0159Z, Feb 23
World Wide Patagonia DX Contest	0000Z-2359Z, Feb 23
North Carolina QSO Party	1500Z, Feb 23 to 0100Z, Feb 24
ARRL Inter. DX Contest, SSB	0000Z, Mar 1 to 2400Z, Mar 2
NSARA Contest	1200Z-1600Z, Mar 2 and 1800Z-2200Z, Mar 2
South America 10 Meter Contest	1200Z, Mar 8 to 1200Z, Mar 9
Oklahoma QSO Party	1500Z, Mar 8 to 0200Z, Mar 9 and 1500Z-2100Z, Mar 9
Idaho QSO Party	1900Z, Mar 8 to 1900Z, Mar 9
YOTA Contest	1000Z-2159Z, Mar 9
Wisconsin QSO Party	1800Z, Mar 9 to 0100Z, Mar 10
Virginia QSO Party	1400Z, Mar 15 to 0400Z, Mar 16 and 1200Z-2400Z, Mar 16
IRTS 80m Counties Contest	2000Z-2100Z, Mar 19

NFARL Upcoming Events and Dates

NFARL Club Meeting

February 18th 7:30p to 9:00p
(doors open 7:00p)

Preston Ridge Community Center [Zoom link](#)
3655 Preston Ridge Road
Suite 100
Alpharetta, GA 30005

Meeting ID: 862 5582 7457
Passcode: 584698

NFARES net

Every Sunday, 8:30 PM
NFARL Repeater
147.06 (+) PL100
All hams welcome

Tech Talk

Every Monday, 8:30 PM
NFARL Repeater
145.47 (-) PL100
[NFARL Discord](#)

Hungry Hams

Every Wednesday, 11:15 AM



34 East Crossville Road
Roswell, GA 30075

CW CHAT

Every Wednesday, 8:00 PM
[Zoom link](#)

YL Net

Every Thursday, 8:00 PM
NFARL Repeater
147.06 (+) PL100

Executive Team Meeting

Fourth Tuesday, 7:00 PM
Zoom
[Groups.io](#)

NFARES Meeting

Third Tuesday, 7:30 PM
The Church of Jesus Christ
of Latter-day Saints
500 Norcross St.
Roswell, GA 30075
[Zoom link](#)

VE Testing

Second Saturday, 8:30 AM
Slope's BBQ
34 East Crossville Road
Roswell, GA 30075
[Registration required](#)

FUN Net (digital)

1st & 3rd Thursday, 8:00 PM
NFARL Repeaters
147.06/443.15 (+) PL100
Echo-Link N4SBD-R
Node: 522043

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nfarl.org

eNEWS can be located online at: <https://nfarl.org/enews-index>

Club Repeaters

Frequency	P.L. Tone	Location	Notes
145.470 (-)	100 Hz	Morgan Falls	EchoLink Node 560686 NF4GA-R
147.060 (+)	100 Hz	Roswell Water Tower	Primary ARES Repeater
443.150 (+)	100 Hz	Roswell Water Tower	
444.475 (+)	100 Hz	Morgan Falls	

Club Call signs: NF4GA and K4JJ

Extra Extra answer: **A (question E4D01)**

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