QST NFL

Newsletter for the Northern Florida Section

Come join the FUN!

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From the Shack of the Section Manager

Scott Roberts, KK4ECR (kk4ecr@gmail.com)

WOW! September has been quite the month. I want to start by thanking everyone for your prayers, phone calls, text messages, and notes during my recovery from open heart surgery. Long story short, what started as needing simple knee surgery, ended up with triple bypass surgery. I am recovering well and doing much better. Oh, and I still need the knee surgery.
In the Northern Florida Section, where camaraderie and community spirit thrive, amateur radio has been a hidden gem for decades. Since you are already a ham radio radio operator, you know the magic it holds. But have you ever considered the profound significance of promoting this invaluable hobby? Amateur radio isn't just a pastime; it's a lifeline during emergencies. As the Section Manager, I can attest to its indispensable role in our community. When the storm clouds gather or disasters strike, ham radio operators become the unsung heroes. But this isn't just about crisis management; it's about fostering a robust network that benefits us every day.

Promoting ham radio isn't just an act of generosity; it's an investment in our future. By sharing our knowledge and enthusiasm, we inspire the next generation to embrace this timeless art. We're passing down a legacy of resilience, innovation, and communication prowess that transcends technological trends. In a world increasingly reliant on digital connections, ham radio reminds us of the beauty of analog bonds.

Let's face it; the more individuals join our ranks, the stronger our community becomes. Each new member brings unique skills, fresh perspectives, and diverse backgrounds. They infuse vitality into our hobby, pushing the boundaries of what's possible. Together, we grow, learn, and innovate, enriching the collective experience.

In addition, promoting ham radio is about fostering friendships that transcend geographical boundaries. The beauty of this hobby lies in its ability to connect us with kindred spirits worldwide. Whether you're chatting with someone in Europe, Asia, or right here in Clay County, ham radio creates a global family that transcends borders and languages.

Now, some might wonder, "Why should we actively promote something so niche?" The answer is simple: because it's not just a hobby; it's a gateway to lifelong learning. Ham radio enthusiasts are tinkerers, problem solvers, and lifelong students of technology and communication. By welcoming newcomers,

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we provide opportunities for personal growth and exploration that extend far beyond the confines of our radio shack.

Promoting the hobby of ham radio isn't just about boosting our numbers; it's about sharing the magic, resilience, and community that define us. It's about ensuring that future generations can discover the joy of making friends around the world with a simple radio transmitter. It's about being the guiding beacon in times of crisis. It's about Clay County, Florida, embracing the heart of ham radio and passing it on with warmth and enthusiasm.

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What's Inside

NFL Officials

Section Manager
Scott Roberts KK4ECR

Assistant Section Managers
Kevin Bess KK4BFN
Helen Straughn WC4FSU
DJ Stewart KI4ZER
Joe Bassett, W1WCN

Section Emergency Coordinator
Arc Thames W4CPD

Section Public Info Coordinator
Jim Bledsoe, KI4KEA

Section Technical Coordinator
Frank Haas KB4T

Section Affiliated Club Coordinator

Section Traffic Manager
Helen Straughn WC4FSU

Section Official Observer Coordinator
Robert Leasko WB8PAF

Section State Government Liaison
Darrell Brock N4GOA

NFL Committees

Webmaster, www.arrl-nfl.org
Kari McClure, NW4R

Newsletter, *QST NFL*
Marty Brown, N4GL

QST NFL *is a monthly publication of the ARRL Northern Florida Section.* ***QST NFL*** is intended for wide distribution within the NFL Section, including club Leaders and all licensed Amateurs in Florida. A current issue of this publication can be found at the ARRL Southeastern Division web site, Northern Florida Section. www.***ARRL-NFL.org*** Opinions expressed by contributors are their own, and may not express the positions of the ARRL.

Submissions may be made to the editor: Marty Brown N4GL.MARTY@gmail.com.

All submissions are subject to editing prior to publication.

Looking for Something?

Gordon Gibby, KX4Z, has taken the time to index the articles from all the 2021 issues of ***QST NFL***! https://arrl-nfl.org/wp-content/uploads/2021/12/2021QSTNFLIndex.pdf

So, team, let's continue to be ambassadors of this extraordinary hobby. Let's open our arms and our airwaves to those who are curious. Together, we'll amplify the heartbeat of ham radio, ensuring it resonates for generations to come.

Although my travel has been limited slightly by doctor's orders, I can still attend your meetings by Zoom. I'd love to have the opportunity to speak to your team.

Also, I am always looking for nomination for NFL Section Member of the Month. Please forward your nominations to me so we can get them in the monthly newsletter.

Thank you for trusting me to be YOUR Section Manager.

10 tips for amateur radio operators:

1. Education and Continuous Learning: Always be open to learning. Attend amateur radio classes, workshops, and seminars. Technology and protocols evolve, so it's essential to stay updated.
2. Practice Regularly: Like any skill, proficiency in radio communication improves with regular use. Join weekly nets, participate in radio contests, and make regular contacts.
3. Listen More, Transmit Less: Especially for new operators, there's immense value in listening. You can learn a lot about proper protocols, etiquette, and how experienced hams operate.
4. Know Your Equipment: Understand the functions and features of your radio equipment. This not only helps in effective communication but is also crucial during emergencies when swift adjustments are necessary.
5. Antenna Matters: A lot of radio performance is dependent on the antenna. Experiment with different types, understand their characteristics, and ensure they're optimally positioned.
6. Maintain a Logbook: Keeping a detailed log of your contacts can be beneficial for tracking your progress, confirming contacts for awards, and referencing past communications.
7. Be Respectful: Always follow radio etiquette. Wait your turn to speak, avoid interrupting ongoing conversations, and be polite. Remember, the airwaves are shared, and courtesy goes a long way.
8. Engage with the Community: Join a local amateur radio club or organization, like the Amateur Radio Emergency Service in Clay County. This provides networking opportunities, assistance in troubleshooting issues, and a chance to participate in community service.
9. Stay Legal: Always operate within the regulations set by your country's governing body. This includes understanding frequency allocations, power limits, and other relevant rules.
10. Prepare for Emergencies: Since you're involved in emergency coordination, ensure you have a go-bag with essential radio equipment, backup power solutions, and a list of vital frequencies. Regularly participate in emergency drills and simulations to test your readiness.

Incorporating these tips can help amateur radio operators enhance their skills, contribute positively to the ham community, and be better prepared to support their local communities during emergencies.

NFL Section Member of the Month!

We are accepting nominations for the NFL Section Member of the Month. To submit a nomination, please send an email to Section Manager Scott Roberts at kk4ecr@gmail.com. Include the nominee's name, call sign, county, reason for the nomination, and a photo of the nominee. Arc and I will review the nominations and reach out to you if we have any questions.

From the Section Emergency Coordinator

Arc Thames, W4CPD

In times of crisis and disaster, the ability to respond swiftly and effectively is paramount. Amateur Radio Emergency Service (ARES) volunteers are a critical resource, providing essential communication support during emergencies. To maintain our readiness and enhance our capabilities, it is crucial that we regularly participate in exercises, drills, and community engagement.

Exercises are not mere formalities; they are the bedrock upon which our preparedness rests. They serve as invaluable opportunities to sharpen our skills, test our equipment, and fine-tune our emergency communication protocols. Emergency communication requires a high level of proficiency in radio operation and message handling. Regular exercises provide ARES volunteers with the chance to hone their skills, ensuring they can transmit vital information swiftly and accurately when it counts.

Testing our equipment is also critically important. Through exercises, we can identify and rectify any technical issues or weaknesses in our gear. This proactive approach ensures that our radios, antennas, and power sources are always ready for deployment or activation. Additionally, exercises give us an opportunity to test our processes and procedures to ensure they are up to date and repeatable so that no one person becomes a single point of failure.

Annually, in October, the ARRL asks amateur radio teams to participate in a nationwide SET (Simulated Emergency Test.) Due to the SET being in the middle of hurricane season, we have decided to perform our annual exercise in the spring of each year as was done earlier this year. This allows us the opportunity to test all of our equipment, gear, and processes ahead of hurricane season to be prepared to respond when needed.

Just as a heads up, I am running behind on emails. Unfortunately, we've been hit with several family emergencies over the last several weeks including a loss in my family, so I do apologize if I have been unable to respond to you. If a critical need comes up, when I'm unable to respond, you may always reach out to our Section Manager, Scott-KK4ECR.

Monthly Statistics

In August, our ARES teams reported an incredible 2,071 hours among the 17 counties that reported. Most of this activity was in response to hurricane Idalia that impacted numerous counties in the big bend area of the state.

	Number	Person-Hrs
Exercises this month:	2	19.00
Training events this month:	20	292.00
Public service events this month:	6	53.00
Community service events this month:	6	78.00
Emergency events this month:	37	1,019.00
SKYWARN events this month:	6	181.00
Meetings this month:	28	294.00
Unclassified events this month:	40	135.00

Call signs of DECs/ECs reporting:
W4CPD K4SOP KC4NVU W4UFL K4BJS KO4YOL KB4HAH KX4LEO KN4PFZ N4JTK WE4MJ WA4MN W4KKJ W4CJB KA3OGG KO4KUS W4RFJ

58th Annual Melbourne Hamfest and ARRL Florida State Convention

October 13, 2023 1PM-7PM
October 14, 2023 9AM-3PM
Melbourne Auditorium, 625 E Hibiscus Blvd, Melbourne, FL

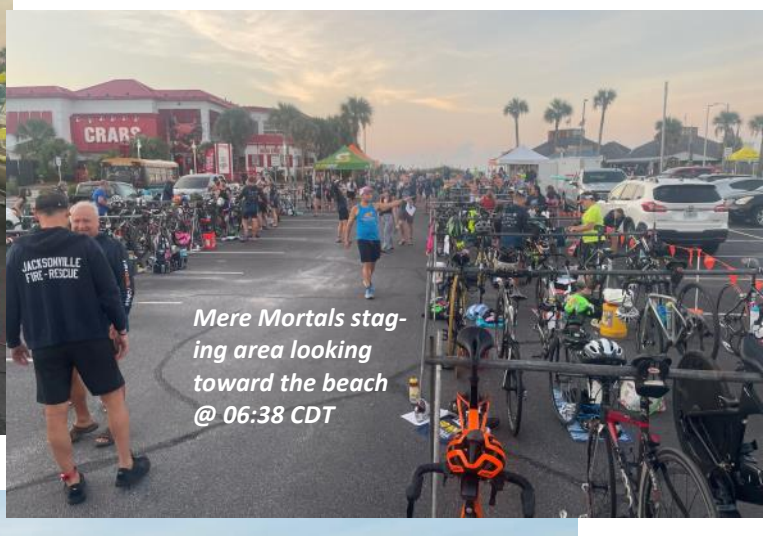
Five Flags Amateur Radio Association (FFARA) Mere Mortals Triathlon

Gene Bannon, KB4HAH

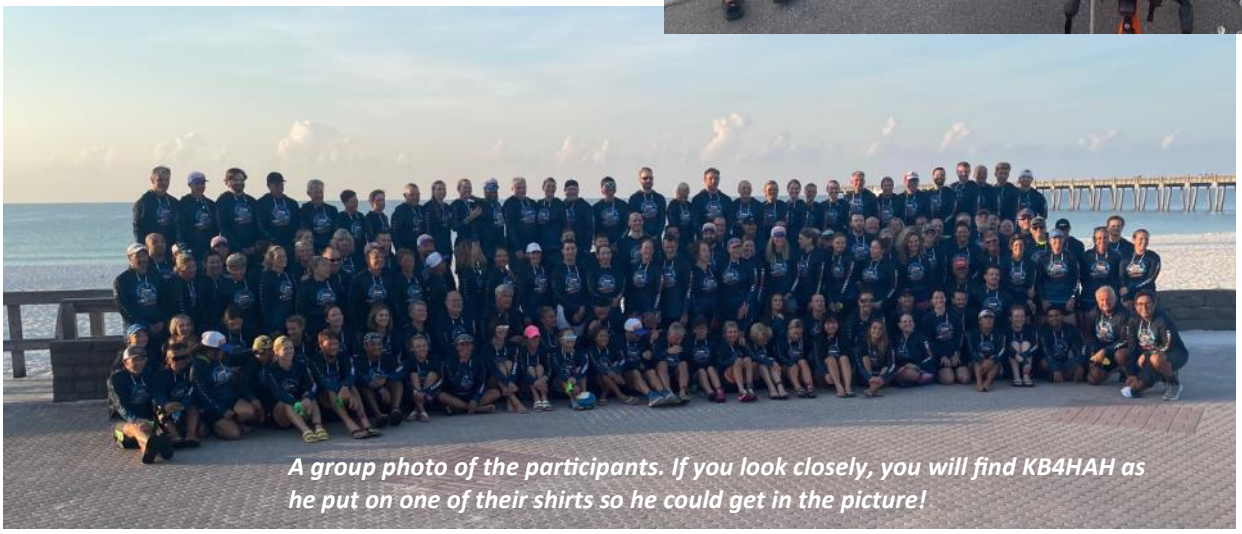
This past Sunday, The Five Flags Amateur Radio Assoc (FFARA) went out and supported the local Triathlon group (Gulf Coast Tri) members' only Triathlon. We supported their emergency communications and reported the status of the overall race to the race officials, who were shadowed by John-N8JUC. We started our operating at 5 AM at the Pensacola Island Casino parking lot (the one with the beach ball water tower in it) with Mike-N4DIA as our designated NCS operator and the rest of the crew setting up the NCS station at the back of swim/bike - Bike/Run transition station. The triathlon started at 7:30 with 2 corrals (men and women corrals) of swimmers entering the water at 2-minute intervals. Johnny-KM4JMS reported the start of the race to all stations and also reported when the last swimmer was out of the water.

At which point Gene-KB4HAH mounted his amateur radio-equipped bike and started falling in behind the last rider as caboose/sweeper. He gave status reports of the last rider position, while George-KQ4JPY reported at the bike turnaround (7-mile mark of the 14-mile bike course) the first triathlete biker heading back to the transition area. The last rider position changed hands several times as the different triathletes started losing steam on the bike portion of the triathlon. Finally, the last rider pulled into the transition station to start his run. Gene-KB4HAH again fell in behind the last runner on his bike to give status reports of the last runner's location. Again, this position changed hands as the different triathletes dropped out of the triathlon as they gave up/ran out of steam. The race finally ended with the last runner finishing prior to 11 AM.. Overall, the event was safe and fun, with everyone thanking the hams for their support of the race.

FFARA Net Control station @06:35 CDT



Mere Mortals staging area looking toward the beach @ 06:38 CDT



A group photo of the participants. If you look closely, you will find KB4HAH as he put on one of their shirts so he could get in the picture!

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(Above) The pre-race briefing of the participants. Again, find KB4HAH in the photo.

(Right) FFARA Net Control dual band Diamond X30A antenna at 25 feet.

Passing it On…

Marty Brown, N4GL, Editor

Thanks to YOU, ***QST NFL*** has become an excellent vehicle for promoting the NFL Section, and we want to spread the word. Gordon Gibby, KX4Z, has an easy and efficient approach to help accomplish this goal. Using email, Gordon sends the ***QST NFL*** link to the groups he participates with that are ham radio-related. Gordon also takes the extra step to note the articles and pictures that are of particular interest to the group he's addressing.

Please follow Gordon's lead and forward the link that came in this email to your ham radio groups and friends and invite them to read and participate. Getting greater exposure will also get us a broader range of subject matter.

Thanks to everyone, readers and contributors, for your time and talent.

FLORIDA SUNSHINE STATE

QST NFL

Newsletter for the Northern Florida Section

Come join the FUN!

VA6AM Kit Part 2: Converting 20M filter to BANDPASS

or "The First Step Toward the QuintPlexor"
by Gordon Gibby KX4Z

In the first article in this multi-part construction saga[1], I documented how our club, the North Florida Amateur Radio Club (https://www.nf4rc.club/), tuned a VA6AM 100W ("low power") Triplexer kit that we purchased at modest price (https://va6am.com/2017/01/25/first-blog-post/). Tuning was easily accomplishing using a modestly-priced nanoVNA, at one of our LunchNLab meetings, and the group had a *great* time learning that just pinching or expanding the gaps between windings on iron core toroids makes really big changes! (See Fig 1) We were able to move the series-to-ground notch-traps move quite easily and got our TRIPLEXER (20m/15m/10m) working quite well, although we didn't get our passband losses quite as low as the designer has been able. Plenty good for our use!

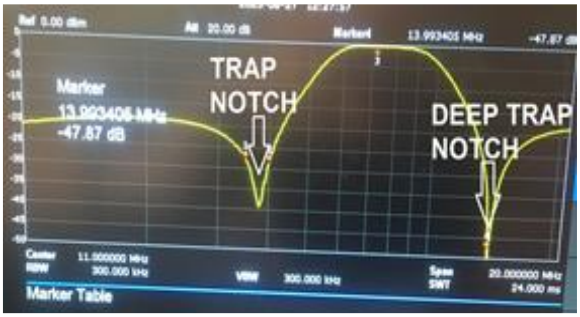

Fig 1: Example of "trap notches" above and below the passband. Notch frequencies easily shifted by pinching or separating turns on toroids

Pavel uses three different types of filters for his TRIPLEXER -- a **high pass filter** for 10m (that would also pass 6 meters); a **Bandpass Filter** (with two traps) for 15 meters, and a **low pass filter** for 20meters. *But we wanted to be able to run as many as 4 or 5 bands in the future* --- and that 20 meter low pass filter would let 40m or 80m energy right back into the 20m rig, so that design is a real problem!

Pavel has a low-loss solution for this, but it is complicated and quite pricey. He recommend purchasing a **diplexer** that splits the ham bands in two parts. and then **another triplexer** to split up the lower bands. It looked like that would be hundreds of $$$dollars to complete. We wanted something much cheaper and simpler, even if the performance was a few tenths of a db less optimal.

So that 20m low pass filter needs to turn into a 20m BANDPASS filter, along the lines of the 15m filter...I thought that would be easy!

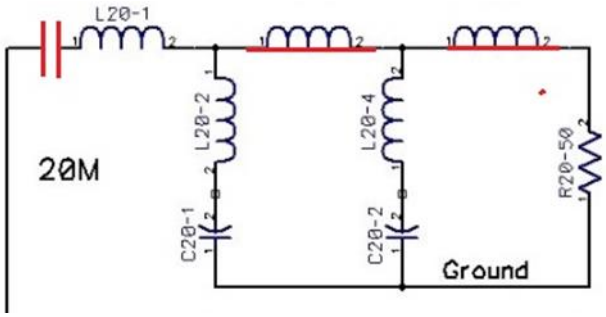

Fig. 2: First attempt at 20m bandpass filter (3dB passband loss!)

<u>This Should Be Easy, Right?</u>

I simply replaced Pavel's input coil with a series tuned circuit of approximately 130 pf in series with 1 uH (approx 16turns T130-17, 130pf made out of 4 paralleled capacitors > 1kV)[2] to make a series tuned resonant 20m circuit at the input and got rid of the other series coils as in Figure 2, and thought that would work somewhat.....*Boy, was I ever wrong*! Even with the series resonance adjusted properly, the passband 20-meter loss was several dB! (About 3dB). **That won't work! A 3db lossy filter will absorb HALF of the transmitter energy...and burn up!**

I was so confused I gave up and went to dinner with my wife, Nancy, KM4YGI. Over dinner the explanation hit me: <u>those other two traps haven't disappeared just because we aren't at their resonant frequency</u> -- in fact, because we are BELOW their resonant frequency, their inductors have lower reactance than their capacitors....and both traps are acting like SHUNT CAPACITORS dragging down my passband signal!

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[1] *See page 13ff of https://arrl-nfl.org/wp-content/uploads/2023/09/00-QST-NFL-September-2023.pdf*
[2] *All of these values are going to be approximate and builders will almost be guaranteed to need to "tune" their circuits.*

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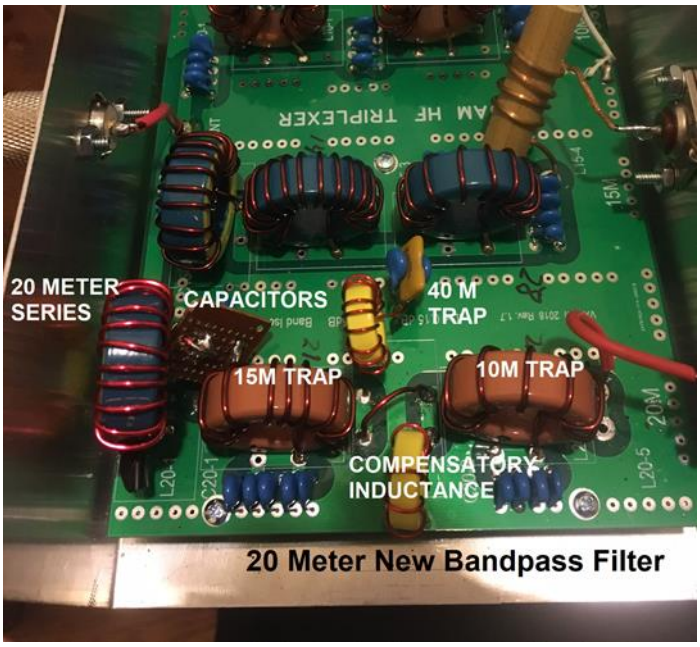
Then the true brilliance of Pavel's designs became clear to me. For Bandpass filters, Pavel puts two traps to ground, one tune *below* passband frequency and one tuned *above* -- and he cleverly selects their values so that at passband frequency, the inductive result pairs with the capacitive result to make a parallel-resonant tuned circuit that becomes a resonant very high impedance and doesn't drag down the output! (A little math shows you can make this work perfectly because our bands are so harmonically related.) I had really fouled up his filter....



Fixing My Goof

The first part of the solution was to add in a series trap to ground at a lower frequency -- 40 meters of course. I chose 600pf & approx. 0.86 mH (14t on a T80-6). (These reactances were in line with was Pavel was using on other traps.) None of our components are perfect, so tuning the notch frequency to 7 MHz required dropping to 12 turns. I wasn't bright enough to make this completely cancel out the capacitive reactance of the 15m and 10m traps, so there was a need for an additional parallel inductance to ground to resonate at 20, estimated at approx 0.3 mH. A T80-6 coil was experimentally adjusted to 6 turns (possibly 0.16 mH or 14 ohms inductive reactance at 20 meters) at which point the 20m loss went down to a wonderful 0.26dB. This is an example of adding in a complex number (inductive reactance) to perfectly balance out another complex number (capacitive reactance).

Ham Radio, Meet High School AP Precalculus Class

It turns out that my AP Precalculus high school students were studying *complex numbers* right then, and even had a homework problem where complex impedances were in parallel.....so I lugged the entire filter, a soldering iron, and a spectrum analyzer (with all the coax BNC cables and everything) to class and showed them adding and subtracting complex numbers, by alternately connecting and disconnecting that last compensatory parallel inductor -- the impact on a "linear" scale was astonishing. [The students haven't had logarithms yet, so I didn't put the analyzer in dB mode....just linear. The loss went from 50% (3db) to nearly nothing....very, very impressive!] I had advertised this a bit...**and the school Yearbook Photographer showed up and snapped dozens of photos as I heated up the soldering iron and did a practical example of complex numbers in an AP Math Class!** Talk about ham radio in the high school classroom!

> **NOTE for Future Builders:** There is a LOT of circulating current in that 6-turn T80-6 coil. A **brighter solution for the future** might be to simply remove the 10 meter "trap" (which would reduce the capacitive loading considerably) and choose the values of the 40 meter trap to cancel out the 20m residual. Even using my 40m trap, this will only need easier-to-provide larger values of inductive or capacitive parallel compensating reactance to tune. If you repeat my build, definitely use #16 AWG wire for that compensating inductor!

Triplexer Ready for Expansion

Even if we hadn't proceeded any farther in our development, our Triplexer now offers some isolation from a 40 meter transmitter (presumably on a different antenna). The original design had very low loss, but no defense against 40 meters.

[3] These are MICRO Henries, with a Greek symbol m. (mu) An incorrect font might show an incorrect m. Beware!

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Our approximate performance at this intermediate stage looked like this:

Signal at common Antenna connector	40 meters	20 meters	15 meters	10 meters
Operating BAND PORT				
20 meters	-57 dB	-0.23 dB	-32 dB	-44 dB
15 meters	-24 dB	-34 dB	-0.49 dB	-31 dB
10 meters	-24 dB	-48 dB	-37 dB	-0.43 dB

Operating passband losses are shown with a blue background; the other losses are desirable ISOLATIONS. **Additional bandpass filtering is required** to make the sum ALWAYS greater than 50 dB (safety) and preferably closer to 60 dB for operation.) With more care, we could get our passband losses lower....but with 300 feet of coaxial cable between our transmitter and the Antenna, these losses aren't the real problem...

AUXCOMM Course Orlando

J. Gordon "Gordie" Beattie, Jr., W2TTT, W2TTT@ATTT.net

Last Spring, Jim Bledsoe KI4KEA from Alachua County and Gordon Beattie W2TTT from Suwannee County were among the twenty-three student participants in the AUXCOM course held at the Orlando Emergency Operations Center. Pardon the omission of other students by name, but the roster does not have agencies or callsigns.

The course had a great group of instructors and students including Jim Mezey W2KFV ARRL Section Manager for the New York City-Long Island Section. Jim is an experienced First Responder and instructor in his own right, came to Florida to attend as an AUXCOM student.

Congratulations to all those who participated in the AUXCOM course!

Taming the sBitx Developer Edition

by Gordon L. Gibby KX4Z

Ashhar Farhan has built *so many* unique and inexpensive radios, that we were all very excited when he announced a few years back that he was going to build an open-source SDR HF radio based on the Raspberry Pi[1]. I snagged one of the 150 Developer Editions (essentially a beta testing phase) -- and proudly own Serial No. 0026. This is the saga that played out.

Of course there were "issues." I endured several problems and was amazed at the quality of the FREE upgrade kits that emanated from https://www.hfsignals.com/ The problems that vexed me the MOST were spurious emissions. You really can't have those, not exceeding US FCC regulations, which for HF radios require that spurious emissions be 43 dB or more lower than the correct signal (-43dBc; 43 dB below carrier).

This article is designed to go through several of the most important spurious emissions that I or others in the ham radio community have addressed in the sBitx. This led to a successful Version 2. There is a lot to learn about the cycle of developing a new radio. In aviation, the running joke is that what is required to come up with a "new" airplane design is three companies -- the first two dissolved into bankruptcy along the way, vaporizing a bunch of investor capital, and then finally the last corporation to take up the design barely limps along without being destroyed.

Switching Regulator Noise

In the original Developer Edition, a linear 3-terminal LM338T regulator (with some associated circuitry) was used to develop the 5.1VDC needed in considerable amperage by the power-hungry Raspberry Pi. This was a significant problem in terms of wasted power and heat generation coupled to the final amplifier heatsink, to which the linear 3-terminal regulator was mounted.

A (free) upgrade was shipped to ALL of the Developer Edition purchasers with a small circuit board with a switching regulator to replace the LM338T. It ran *much cooler* and of course wasted a lot less power.....but then a new spurious emission product showed up, approximately 500kHz up or down from the desired signal.

The accompanying spectrum analyzer photo[2] shows a desired signal just under 4MHz in the ham bands -- and then two high-level spurs +/- 500 kHz away, at roughly 3.448 MHz and 4.492 MHz -- both completely outside the ham band, and -33dB and -37 dB compared to the desired signal. Hence clearly above the limit-- **strong!**

Amidst a flurry of wrong turns and dead-ends by all of us on the BITX20 forum, it was Evan Hand AC4TU who solved the problem on Feb 14, 2023 with both an output filter on the switching regulator and a *huge input capacitor* (3300 uf) to ground to dampen the pulses on the +12V line from the switching regulator's intermittent current spikes. The +12V line gets switched to turn on/off various transmitter stages and *any AC signal on that line can get modulated right into the transmitter output*. Evan's solution ended up as a permanent part of the next version model, V2, with much better filtering of the switching regulator's input supply.

[1] https://rsgb.org/main/blog/tonight-at-eight-archive/2021/11/01/1-11-21-bitx-to-sbitx-the-journey-and-development-of-this-exciting-and-affordable-range-of-transceivers-by-ashhar-farhan-vu2ese/

[2] This (and most other photos in this article) was captured via a 50-ohm dummy load with a resistive tap feeding a Siglent SS1 3021S spectrum analyzer. Receiver bandwidths vary in different testing sessions.

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Befuddlement Due To Solder Joint Issues: HEAT TRANSFER

This investigation was muddled by various and different terminations of the IF crystal filter, that had at least me confused. At the same time, my power output suddenly dropped by 20dB! Took some time figure that out: one of my output MOSFETS developed a cold solder joint on its drain lead turning my "push-pull" final into a "push-nothing" amplifier. This actually happened again, somewhat later, on the other final MOSFET. It appeared to be *solder migration* or deformation from temperature swings on the MOSFET. (Hard to believe, huh?) Much later on, we all learned to change out the mica heatsink insulators for far more thermally conductive Aluminum-Nitride[3] insulators from China. No problems with the solder joints after that.

Case and Heatsink Grounding: IMPORTANT

At the same time that all this investigation was going on, Evan AC9TU also discovered that the paint on various panels was preventing effective grounding/shielding. On Feb 26, 2023, he reported, this was the cause of a 3rd harmonic on 20 meters that was out of spec. He particularly cited paint preventing the heatsink from being well connected to ground. Once he ground off the paint at the screw holes, his harmonics were down to -50dB with respect to the desired signal, far better than required.

Driver Transistor Matching: IMD

Ashhar uses four 2N2219 bipolar transistors in the driver stage, and he runs them fairly hard with relatively little negative feedback! This was to develop enough drive to conquer the high capacitive loading of the final stage gates, after the original IRF510 MOSFET driver stage was completely removed due to excessive gain leading to instability (oscillations). With one less stage, a lot of gain is needed from each remaining stage. Their cases get significantly hot to the touch, although the computations indicate the junctions are still within data sheet limits. However, inspection with an infrared temperature "gun" demonstrated that one of *my* four was significantly hotter than the other three. I had spares for this transistor acquired from DigiKey and a little trial and error got me a somewhat better balanced set of drivers with a small improvement in IMD products from that stage.

Reducing si5351 Internal Oscillator Coupling

While we were all running around dealing with various IMD products, Ashhar did a bunch of insightful experiments and proved that some of the distortions were literally happening totally inside a chip! The triple oscillator si5351 miracle chip that can make almost any frequency you need, had signal apparently coupling from one oscillator to another, through non-perfect internal ground connections, inducing IMD. Ashhar reported this on Jan 30, 2023. An improvement in the design was to switch which two of the three internal oscillators were used-- reducing the coupling. Additionally, loading on the si5351 was reduced by decreasing a coupling capacitor (C33) down to only 2.2 pf. The commutating mixer chip FSA3157 already has an extremely high input impedance, so it provided little loading to the other oscillator in use on the si5351.

Interlude

With my various power supply experiments, somehow I managed to fry my available Raspberry Pi 4's, and for several months I was out of the picture, as they were virtually "unobtainable."

Reducing si5351 Noise Even More

After I was able to get back to the sBitx with an external power system, and a new raspberry pi, and the sBitx was getting much closer to being fully tamed, I studied the impact of changing the drive current (via software commands) to the si5351 oscillator. At full drive (8mA) there were a lot of spurs. Not necessarily above -43 dB, but a *lot* of them. Reducing just ONE oscillator down to 2mA actually made it worse. But reducing all three oscillators down to 2mA had the excellent impact of dramatically thinning out the spurs.

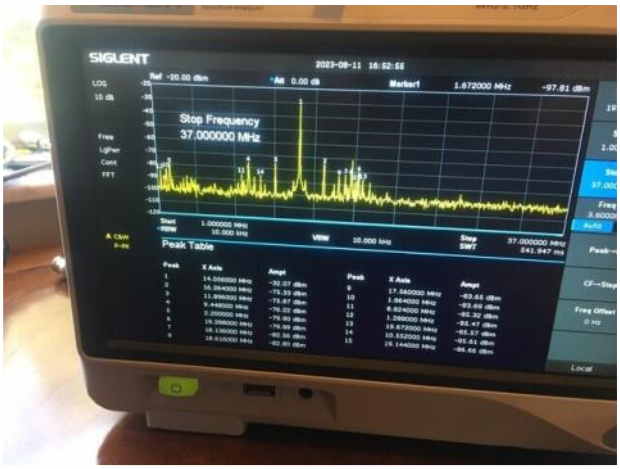

Figure: 8mA drive current on si5351. Lots of spurs.

[3] About 200 times more heat transfer per degree C temperature difference with Aluminum Nitride.

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Reducing 2nd Mixer IMD Products

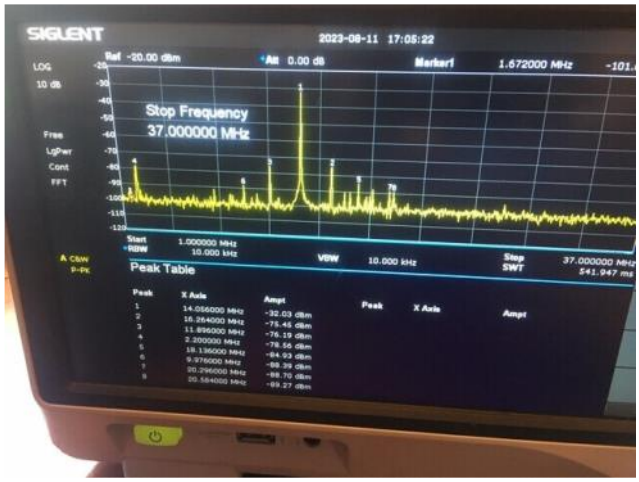


Figure: Reducing si5351 drive to 2mA thins out the spurs significantly

The last spur that I had to conquer was one that bedeviled 80/75 meter operation. It was "tunable." By simply dialing the transmitter frequency, you could dramatically shift where this spur would show up -- and it could even cross the transmitter frequency! Very careful measurements and calculations proved that it was the 11th (odd) harmonic of the operating frequency [likely coupled from the power amplifier], mixing with the Local Oscillator in or about the 2nd Mixer circuit. That was why it was so predictably "tunable."

I tried a bunch of things to quash this final pesky spur. In the end, I significantly increased the idling current to the cheap final MOSFETS from 200mA total, to 360mA total. Easy to do, just twiddle a pot. It is quite possible that my push-pull class AB finals aren't well matched, and the circuit does not have individual bias controls for them. Raising the idling current by only about 2 watts wasn't a huge power or heating problem, and it apparently made the 11th harmonic get significantly smaller. I also added doubled bypass filtering around the si5351 and around the 2nd mixer. I paralleled a new 0.1 uf on top of C73, C74, and C8 and C9. After these changes, the spur receded below the FCC limits. Success! Note: Attempting to add a new bypass capacitor to the +12V line going to the final amplifier stage had a totally unexpected effect of *creating* a new spur, so I left it alone. High power RF can be mysterious!

Conclusions

After all my work, I got the Developer Edition radio to the point that all the spurs on all bands appeared at or below the FCC specs. Actually, pretty good! I've looked briefly at the output of an ICOM 7300 and that much more pricey rig, developed by an army of engineers, is indeed significantly cleaner. But the sBitx fills a completely different niche:

- much lower cost (< 1/2)
- much smaller in size
- much bigger touchscreen
- makes processor available for ham radio applications
- many built-in communications protocols-- decoded in the radio itself!
- nearly full-break-in relay-less CW
- source code freely available!

Each radio succeeds very well at its design purpose. I already have a 7300 which I also enjoy. So I moved to purchase the Version 2 of the sBitx and it has just arrived!

Very important points regarding the crucial jump from ham radio prototype to successful manufactured product (whether kit or not) can also be gleaned from our experience:

- Emissions need to be carefully evaluated in multiple copies of the final product -- to catch unexpected changes.
- **Lead dress** may be VERY important! Users (like me) may need to be warned not to add new wiring inside the RF compartment. Go for optoisolators instead.
- Operating semiconductors near the published edges of their thermal capabilities has risks.
- Aluminum nitride insulators seem to have promise!
- MOSFET gates can be particularly vulnerable in a radio covering an entire decade of frequency range and attendant changes in signal levels. Adding Zeners to protect the final gates seemed like a good idea & I have not yet destroyed a single MOSFET.
- *Any* change to power supplies can add unexpected modulations.

Happy ham radio adventures!

Suwannee ARC Reports on Idalia and Other Activities

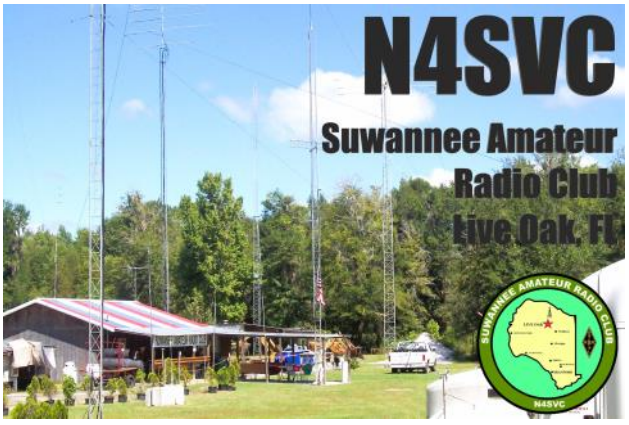
Steve Kostro N2CEI, President, Suwannee ARC

There is not much to report from the Suwannee ARC other than after Hurricane Idalia, we are still here! The month of August started with our First Tuesday meeting and then the traditional operation of the ARRL 222 and Up contest that some members participated in. Others found interest in operating on 6, 2, and 1.25 Meters during the Perseids meteor shower. The peak was forecast to be on Aug 12th but consistent QSOs can be made a week before and after the peak. Contacts on 6M are no different than quick Sporadic E QSO's so membership concentrated on the 144 and 222 MHz bands utilizing one of the WSJT digital modes (MSK144). QSO's on those bands were made in the 800–1500-mile range, including netting a new country on 222 MHZ, (Canada) along with various new states toward WAS on both bands. There is no way to explain the excitement of a long burn or the capturing of data on a ping (a short burst) to complete the QSO! The technology is amazing!

Because of the Aug heat, we did not have weekend work parties scheduled until we received the news of Idalia's possibility of heading our way. Membership spent their available time on the weekend of the 26th picking up and tying down any antenna work projects, clearing our outdoor party area of all possible flying objects, and making the clubhouse station ready for an emergency event if needed, including our generators prepped along with additional fuel. We had tested our 145.410 repeater for emergency power operation previously in July but we verified that our spare antenna for that system and a spare battery was ready to be placed into service if required at the repeater site. We also readied our back up repeater system that would be placed on one of the various towers the club maintains if our main system tower met its demise.

On the morning of Aug 30th, Idalia moved through the area. The town of Live Oak and the surrounding area that encompassed our repeater site and clubhouse suffered power outages lasting 3-4 days. Our repeater switched to emergency power and because Idalia left our 160-foot tower and antenna intact, it could provide communications for the Amateur Radio operators in the area that had emergency power or handhelds. It also provided communications to those in the western part of the county who lost all utilities, including cell service for the following 8 days.

As for our Clubhouse, our resident property owner reported that the N4SVC grounds received some minor damage, but all 9 towers were still standing, so no need to do any emergency work at the Station. Then, during the Labor Day weekend, some members made it through the clogged-up roads to the clubhouse grounds to access the damage. After clearing many trees and limbs on the entrance to the grounds we made the complete assessment. All 9 towers were undamaged (guys and anchors checked) but we did find minimal stretching of guys. Then out of the 52 antennas in service at the station, we verified minimal antenna twisting off their headings along with the only damage done to one of our KT-34 HF triband antennas that was scheduled for removal. Now we only need to remove the other half Idalia left us! Basically, the N4SVC station was ready to provide emergency service if required. The building did not have any damage and the generators were ready to go but the town had restored cell service rather quickly, so the club's Board of Directors felt no reason to offer our services or station to conduct any emergency assistance. However, we did question the nonactivation of the county's EOC with the ARES/CERT group that conducts their business there.



The following weekends in September have been clubhouse grounds clean up and antenna re-alignment. The club has one Tower climber and since this is a hobby, it's been a slow go for membership to completely restore the N4SVC station to its previous service. But we have enjoyed some activity on the bands and found time to operate the CQ WW DX RTTY contest on the weekend of the 23rd. We have a bit more cleanup work to do but plan on having our annual clubhouse birthday party during our Tuesday night meeting on OCT 3rd.

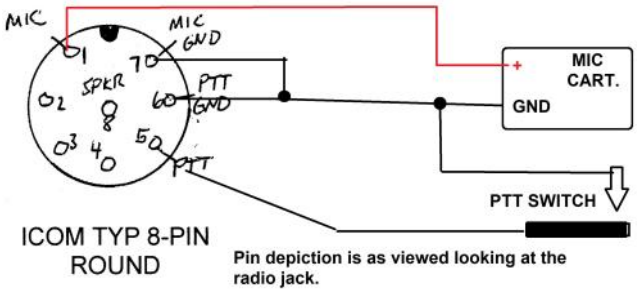
So, if you are passing through the Live Oak area, take time to say hello on our 145.410 repeater (-600, 100 PL) and as always, if you hear us on the bands 160M through 3cm, give us a call and say HI! Then if you worked us in any operation event, you will find your QSO information on LOTW. Yes, we have had some setbacks this past month, but we are close to "back to normal" at the station and enjoying this hobby as in the past! We hope you are enjoying your favorite aspect of the hobby and maybe catch you on the bands some day! See you soon! '73 from all at the Suwannee ARC!

One Evening Project

Homebrew ICOM 7300 Desktop Mic
by Gordon Gibby KX4Z

For a long time, I've wanted a real "desktop mic" for my home station(s). The going price of the Icom SM-30 (typically $170!) discouraged me greatly, since I know it is based on a $2 electret cartridge... At various hamfests I have picked up assorted older "Turner" style desktop microphones-- generally for $15. (On Ebay, about $30.) They were made with condenser or dynamic elements, and few hams know how to use them with more modern transistorized transmitters. The mic cable is usually a loss. At a home improvement store, I picked up several feet of two-conductor + shield thin flexible stranded cable that would work for the cable. And I had a small cache of 8-pin octal connectors compatible with the ICOM. (for example: https://www.amazon.com/CESS-Aviation-Socket-Cable-Connectors/dp/B01MTSNNUB)

When I finally found time, I installed a modestly high-output (approx -32dB sensitivity) electret cartridge that came with a uBix kit. A suitable device from DigiKey is: https://www.digikey.com/en/products/detail/cui-devices/CMEJ-4618-32-L045/10253444 $1.20. A really high output device more suitable for uBitx/sBitx (-25 dB) is: https://www.digikey.com/en/products/detail/cui-devices/CMEJ-0733-25-L070/10253454 Avoid the low-output -52 dB devices.... The robust Turner style PTT bar goes to a very simple mechanical switch with obvious solder connections, so soldering that was easy. The mic cartridge has only two solder connections; the one with traces to the case is "ground" and the other is the mic (+) connector. I did not put any switch in series with the mic to avoid any "pops." (See schematic, accompanying.)



Since the mic body is solid aluminum, everything inside is effectively shielded, and wiring inside can be done with simple wire.

I picked off the sound-obstructing center emblem from the grille with a utility knife so the mic cartridge could be installed centered, behind the grille and the fabric "pop screen" that came with the mic. If you need, you can make a pop filter out of the porous fabric of an old t-shirt. Centering the cartridge, I held it in place with some electrical tape and used a circular cardboard disk to help hold it. I packed the cavity behind it with some white synthetic packing material (you could use paper towel) and put it all together so that the mic cartridge was firmly held.

Soldering the ICOM 8-pin connector takes some ***patience***, and a bit of shrink-wrap or electrical tape to insulate each pin. Pin 1 = PTT; Pin 5 = mic; 6 and 7 both get the ground wire from the mic cable. Most plugs will have the "numbers" visible to make this easier. I think Icom has used the same pinout for years. Almost all of these electret cartridges are designed to work with 1-10V dc supply through approx 2000 ohms; the radio provides both the resistive load AND the DC voltage, and picks off the AC audio through a capacitor inside the radio, so you don't have to do anything other than wire the cartridge to the MIC and MIC GROUND pins. Couldn't be easier! Optionally, to deal with any RF energy pickup, you could put a small capacitor (say, 100pf up to 0.001 uf) in parallel with the mic cartridge wiring. Also using a ferrite bead around the cable (and possibly wrapping a turn or two of the mic cable around the snap-on bead) will also reduce common mode current picked up from nearby antennas. These may be unnecessary.

It works great! My $25 desktop mic!

Marion County Emergency Radio Team

Harlan Cook, KN4VRM, Coordinator

MERT

MERT's primary role is to support all open Evacuation Shelters throughout Marion County during declared Emergency events. We also support EOC and emergency personnel along with Community Emergency Response Teams (CERT) with voice, image and data communications resources. "Call MERT…. When all else fails!"

Harlan Cook (KN4VRM) MERT Coordinator

MERT Activation mentioned in "The ARRL Letter" and ARRL Podcast

The August 31, 2023 edition of "The ARRL Letter" included MERT's Activation for Hurricane Idalia. The original report by Marion County ARES Coordinator Hayden Kaufman was edited for the national article and audio report. Visit: http://www.arrl.org/arrlletter?issue=2023-08-31

ARRL also distributed an audio report of MERT's Activation on Sept. 1st at: https://blubrry.com/arrlaudionews/117460864/arrl-audio-news-september-1-2023/

HURRICANE IDALIA VOLUNTEERS

Pat Davis – KQ4BRW
Westport HS

Gray Moffett – KC3DWY
Forest HS

Bill Sobel – K1WLS
EOC Radio Room

Bill Gillespie – KW5BG
MCC Test & Prep

Leon Jurcyszyn – K8ZAG
MCC Test & Prep

Hayden Kaufman – N2HAY
Marion Co. ARES

Search

Check out the NFL Website

ARRL North Florida Section

Scott Roberts KK4ECR – Section Manager

NOARC Hamfest October 14

DJ Stewart, KI4ZER
Assistant Section Manager, NFL, ARRL
President, W4AAZ, W4ZBB, WF4X

Grand Prize FT710

Second Prize FTM500

3rd Prize Nano VNA

Hourly Drawing UV5R

What: Amateur Radio Hamfest
Where: 1446 Commerce Drive Crestview Florida 32539
When: (Day 1): Friday 13 October 2023 @ 8 am vender set up only.
When: (Day 2): Saturday 14 October 2023 Doors Open at 8 am and runs to 2 pm Event Clean up to 8 pm.
Admittance for Vendors and Guests: $7.00 12 and under free. 90 and above free. Boy Scouts in uniform free.
Prices: Vendor Tables/Table Spots: $10.00* each (good for the entire show). Limited tables must plan on bringing your own tables if setting up more than 5. First come, first serve.
NEW THIS YEAR: Tailgate — $5.00 per tailgate spot. Limited quantity so must preregister
Food: Meal and bake sale provided by LOBC, sales benefit the Food Pantry.
Talk in Frequency: 147.360 + .6 MHz 100 Hz tone
Contact Information: KI4ZER@ARRL.Net or call 850.359.9186

https://w4aaz.org/noarc-hamfest/

Activities offered:
License Testing at 10:00 AM, Refreshments, Local Vendors, Area Club Booths and Tables, Private individual, Tables, Tailgate

Mobile NWS Storm Spotter Training Classes after License Testing NO FEE!

Announcing our 4th Annual Youth "Dream Rig" Essay Contest

Dave WD5COV, Vice President The Intrepid DX Group — Submitted by Scott Roberts, KK4ECR, NFL Section Manager

Attention All Groups with a Youth Connection!

The Intrepid-DX Group is a US based 501 C (3) nonprofit organization that promotes Amateur Radio activities around the world. We recognize the importance of including Youth in our great hobby because they are our future! We are continuing with our annual "Dream Rig" Youth Essay Contest to gather the views and ideas of young people involved in Amateur Radio.

What are the Prizes?

* The First-Place prize is an ICOM IC-7300!
* The Second-place prize is an ICOM ID5100AD dual band mobile radio with D-Star.
- The Third-place prize is an ICOM ID52A dual band handy talkie with D-Star.

Contest Rules:

- Two-page Essay answering this question: What attracted you to amateur radio?
- Contestants must be USA or Canadian Amateur Radio License Holders Aged 19 or younger. All contestants must be in the US, including US territories or Canada.
- Promise to keep the radio for one year, not flip it, trade it or sell it, and to use it on the air.
- Send an essay in plain text, PDF or MS Word attachment to intrepiddxgroup@gmail.com by November 30th, 2023. You may alternatively mail it to: The Intrepid-DX Group, 3052 Wetmore Dr, San Jose, CA 95148, USA. Must be post-marked by November 30, 2022.
- Those that have previously submitted an essay may compete in this year's essay contest as long as all other criteria are met.
- The winner of the Essay Contest will be announced on our Website and Facebook page on December 15th, 2023. Winner must agree to provide a photo with their prize.
- All submissions become the property of the Intrepid-DX Group and the winners authorize the Intrepid-DX Group to use their photographs to promote the contest.

Questions: Send an email to intrepiddxgroup@gmail.com

You can follow our contest and receive updates via our Facebook page. Good luck to everyone!

Suwannee County ARES News

J. Gordon “Gordie” Beattie, Jr., W2TTT
W2TTT@ATT.NET

The month of September was spent in recovery mode after Idalia's "visit". While there was no official call for Amateur Radio operators by county officials, there was activity among the hams checking up on each other, sharing relief information with other neighbors, and in-person help of our neighbors. The Suwannee County Commissioners repeatedly noted how impressed and proud they were of their fellow citizens for the selfless efforts of the people helping each other. We should all be proud! Further, we can expect process changes within Emergency Management to make our county more resilient and inclusive of qualified Amateur Radio operators and CERT members going forward.

Thoughts On Damage Recovery

The hurricane brought winds that took down wire antennas or the trees that surrounded or supported them. This, more than power outages, kept operators off of HF. Between yard clutter from fallen trees, other debris and everyday sustainability tasks, getting a replacement HF antenna up became a lower priority. While some VHF-UHF antennas were damaged or lost, recovering a VHF-UHF communications capability was simpler and less burdensome. Having a spare, efficiently deployable HF antenna may be one lesson learned in the aftermath of Idalia. The POTA and mobile HF operators among us may be key to applying these skills for EMCOMM and our own stations. On the bright side, to a person, each member of our team had access to sufficient battery power for their radios, cell phones and other devices.

145.27 Repeater Gets Improved!

We had major damage to the 145.27 W2TTT repeater antenna from Idalia's winds. The top third of the repeater antenna's fiberglass radome simply became an airborne missile and disappeared. The remaining two-thirds split in half as shown in the photos below. Despite this, the repeater had only a modest reduction in coverage.

Continued on next page...

On Sunday September 24th, an aspiring ham Mark Joost from Madison County came by to climb the tower and replace the antenna. Mark's help was timely and has rewarded the community with overall improved repeater coverage!

A brand-new Hustler G7-144 had been purchased on the previous Thursday afternoon as Gordon W2TTT got off a flight from Boston to Jacksonville. Nancy N2FWI, having both patience and a sense of humor, picked up Gordon at the airport and they drove directly to Ham Radio Outlet in Winter Springs and THEN back to Suwannee County. On Saturday, Gordon assembled tuned and tested the antenna in preparation for Mark's help on Sunday. Now coverage is better due to the G7-144's lower angle of radiation.

Net Activity

This month has been good with weekly sessions of the Suwannee County ARES Net at 8:30 pm ET on the145.27 MHz repeater (offset -0.600 kHz, tone 123.0 Hz). Two of these sessions had Jim K4DBC from Madison County as net control. Many thanks to Jim and the rest of the Madison County ARES group for their support! Several of us (Joe KI4TRR, Tom WA4ZET, Mark KN4FRM, Gordon W2TTT, Nancy N2FWI, etc.) from Suwannee County regularly check into the Madison County ARES Net as well as the Taylor County and Capital District nets.

Unfortunately, Suwannee County KK4RQY only made two of the SARNET check-ins on Wednesday afternoons (September 6 & 27). HF activity has also been somewhat limited from our ARES team, but Joe KI4TRR has been on the air for much of the month. Good job Joe! KK4RQY, the Suwannee Emergency Management callsign finally checked in to the NFL Section ARES net on September 27th. W2TTT and N2FWI also had a few NFL Section ARES net check-ins on HF in the last week of the month adding to Joe's month-long efforts.

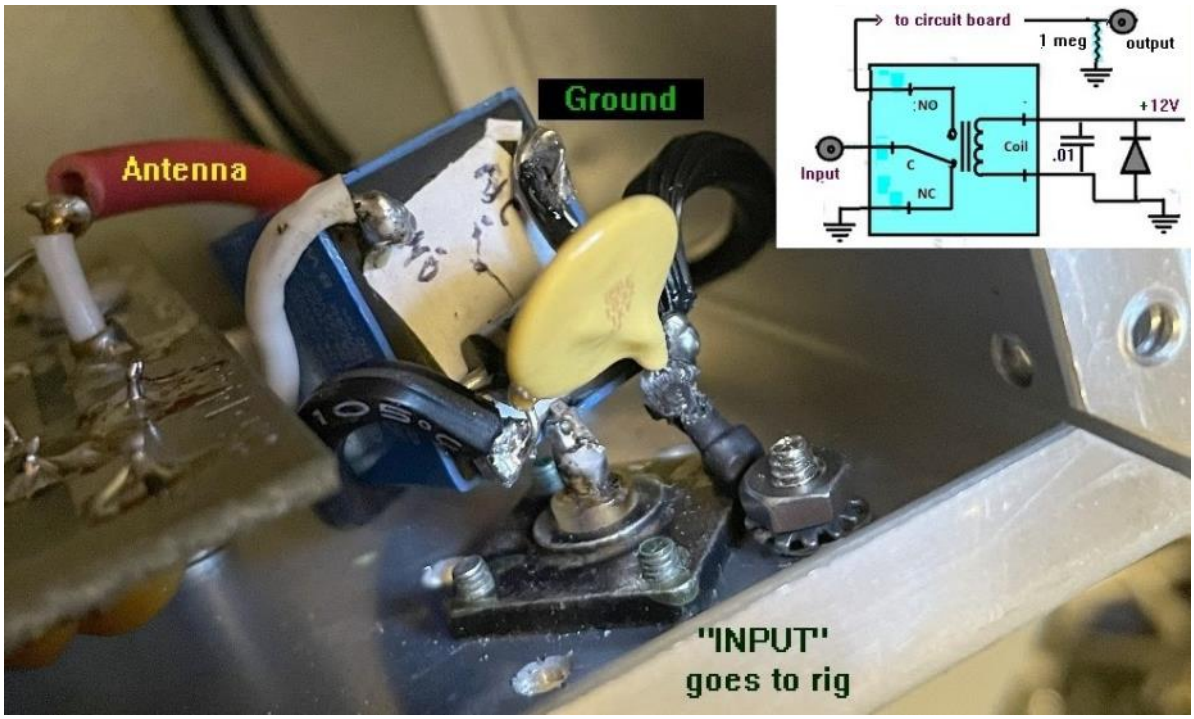
Whack!

As we were surveying post-hurricane damage, we came upon a broken pressure-treated 4x4 that was buried two feet into the ground and six feet above. When the garden shed was torn from its concrete foundation and went on its 350+ foot flight across the road and into KO4LFB's fence, it crashed through the post breaking it in half. The upper part of the 4x4 was found forty feet away from the portion still in the ground! The power of wind from Idalia is quite sobering. Keep that in mind during future storms and plan for safety.

Snapped 4x4 broken by flying garden shed

Rig Protection Built Into a Heathkit SWR/Power Meter

Bob Casey WA2ISE , Submitted by J. Gordon "Gordie" Beattie, Jr., W2TTT, and reprinted with permission of the author.



Above is a picture of the relay inside the Heathkit meter. The BNC connector replaced the original "input" UHF connector. The antenna connector is still a UHF connector. I did this as an additional modification. Having two different style connectors makes it easier when groping around for cables behind stuff. This ensures that the correct cables make the correct connections.

Overview

I wanted to try to protect my IC7300 transceiver from nearby lightning strikes (not direct hits!). I did a mod to my Heathkit HM102 SWR/power meter. In case I forgot to switch the antenna switch to ground, I placed a double throw single pole relay at the "input" to the meter where the rig connects to ground the rig's antenna port when powered down. The meter was a convenient place to place this relay and to package the modification.

How does it work?

When the rig power is off, the relay becomes unpowered, and connects the antenna "input" to ground, and disconnects from the antenna. When the rig is powered on, the relay becomes powered and connects the antenna "input" to the anyenna via the meter circuitry which is a toroid sampling circuit.

Construction

The relay is a 12 VDC type you find in a flat screen TV set or similar device. The relay is powered through an #18 AWG wire connected to the rig's 12 VDC (actually 13.8 VDC) power supply. I used a 2A fuse on the wire near the power supply, as this supply can produce 23 or so amps and I don't want electrical fires! I used a bypass cap 0.01uF at the relay on this wire to avoid RF sneaking a path. The relay's other 12 VDC connection is to ground. I used a rectifier diode across the relay coil to suppress back EMF: cathode to +12V, anode to ground. I tucked the relay between the meter circuitry circuit board and the coax connector for the "input".

I ran the relay 12 VDC wire thru a hole in the metal housing and then to the rig power supply. The relay current returns thru the coax thru the rig and then to the power supply seems to not effect anything, but I added a return 18 AWG wire to the relay anyway. This should divert most of the return current off the coax.

The extra RF path thru the relay seems to have little impact on SWR across all bands 160-6m.

Improvement

Someone mentioned to me that I should use a 1 megohm resistor across the antenna (output) coax connector, to bleed off static charge of antennas that don't have a DC path to ground. This way, the radio front end won't see a sudden static charge when the relay is activated.

Resources Here is a link to the web page for this project.
https://www.wa2ise.com/radios/ham.htm scroll halfway down to find it.

What's Up? Walton & Okaloosa Counties

DJ Stewart, KI4ZER, Assistant Section Manager, NFL, ARRL
President, W4ZBB, WF4X, W4AAZ

Happy Fall Ya'll! Welcome to cooler temperatures, hotter events, activities, and exciting journeys in Amateur Radio! Make your #Hamtober (yes, it's back!) awesome! To get there, we have got, to talk about the great month of September! Yes, that's right, we, you, me, us, them, everyone…participated in a very great period of time to expand our organizations, Elmer new and old, increase our capabilities, and just have a rip-roaring great time! After all, this is supposed to be FUN, and it is!

Up front in the month of September, we got to hang out once again with the fabulous folks in Walton County and dig in as we sat down for chow! Immediately following the chow and jogging 'back east', we ventured over to the Chipola Amateur Radio Club for their annual Labor Day Tailgate! What a great event and these folks, well they have got the solder for your boards! Actually, they had a lot more than that and it was well worth the trip! Bookmark this http://w4bkd.com/, as they continue to make it a place for all to enjoy with welcome arms! Taking the long way home (it was such a nice day for a drive) we got to see a few pals from the previous area called home in Panama City and even made a few QSO's on the local repeaters and shot some Dx from an old familiar spot while Sittin' On the Dock of the Bay!

As adventures and waves with those we don't get to see day to day came to a close, we found ourselves heading for the Playground! That is correct! We made it to Fort Walton Bech and the Playground Amateur Radio Club's weekly Pile-Up! Every Sunday at 3 PM CST, these highly technical, friendly, and great mentors teach, instruct, build, and train! If you can't make regular meetings and you're looking for an organization or even just a swell group of Hams who continuously devote themselves for a socially great time, head on into see them! You will not be disappointed as there is always something for everyone! Dx included!

'Wagons East', as we head back to Defuniak for the WF4X meeting! Let's talk about this group! WOW! You want to be in a place where community matters?! Not that the other areas are not up on the same tune but the unity in Walton County is just superb! The support they provide and the relationships they foster, just amazing! And all of that effort, it goes into helping everyone be a better Ham! You all really should see them in action and take part in wat they do when you have the opportunity!

Back to the Playground for a Tech Night with KM4DYA covering Amateur Radio Licenses, the differences between Classes of them, and testing them as a Volunteer Examiner! Listen here folks, These Technical Nights, they are the next best thing to sliced RF! <- True story and is a real thing! Curious? Just attend one of their Tech Nights to learn more!

Hold that PTT! That Saturday the Playground VE Team got to meet and tested 6 people and passed all 6 people! Congrats to all who earned their Technician License, welcome to the hobby and congratulations to the Ham who upgraded to General! Testing at the Playground is every odd month on the second Saturday at 0900!

Bringing in the middle of the month, the Community minded North Okaloosa Amateur Radio Club held their meeting! What a great time it is in Crestview! NOARC is not only is prepping for the great Hamfest they throw, but they are also gearing up for wat they refer to as 'busy season'! Towers, antennas, projects, parades, festivals, event coordination and participation! As the weather cools, the bands heat up! If you are looking to assist the by volunteering with public events and representing Amateur Radio, consider contacting the Activities Director KN4UDS@gmail.com about the ample opportunities!

Speaking to their Hamfest, they are proud to present ***FREE NWS Storm Spotter Classes*** (series 101 and 201) from the Mobile, Alabama NWS! This is normally a waitlist class online! Come for the show, stay for this rare, free opportunity!

GET YOUR TABLES WHILE THEY ARE HOT!

Continued on next page...

SPEAKING TO TOWER BUILDS! AA0EU, The Playground ARC Treasurer had a project since the temperatures went up. Well, his patience allowed him to ensure he had all the fixins for his dream of a tower at his property! A Lot of pre-work went into this build, and it paid off with a very successful tower day! Large thank you to all that participated through the summer to ensure this event was an easy project and resulted in expanded capabilities the world-over will hear!






This takes us into another Pile-Up the following day with the Playground ARC! These Sundays as noted above, are just full of greatness as the project ideas of each and every operator inspire each other to learn and develop more with the hobby! Be sure to make plans to come see them on Sunday's and not only be inspired but get that assistance you may be looking for with a project!

Guess what's next? Give up?! Nope, me either. Walton County ARES! More awesome WINLINK, DRATS, ICS Forms, formal training, and preparation! The group has grown and that is due to the direct work of W4CJB and KF4ZZ! The information and training here is inviting and presented very well. Interested in Walton County ARES? 75 S Davis Ln Defuniak Springs FL, the 3rd Tuesday of the month at 7PM!

Teams unite to aide in the repair of the NOARC repeater! W4AAZ repeater work was accomplished. The repaired repeater is installed and operating. The lightning punctured coax replaced. Thanks to Bob, W6VVA, Phil, KF4RAF and truly, Robert, KM4VKY. There are a few items on the 'to do' list still to do. Thanks to these volunteers who had a huge hand in the work following a lighting strike! A special Thanks to N4GXX, Steve who has been managing the repeater for a very long time and sharing his knowledge.



Continued on next page...

The Playground Club meets again! For their business meeting! Just like their friends in the North end of Okaloosa County, they too are excited for the upcoming NOARC HAMFEST, and they are in the midst of pulling off their November Tailgate! This is a FREE event in November! For more details check out their webpage!

It seems Like September has been a long month and we are not even close to being done yet! This is the ramp up for many clubs and the next item on the month's report of the goings on is a wonderful addition to bolster and showcase the Amateur Radio Hobby to the public and network with other, national, non-profit clubs and organizations! Four each such organizations were invited to attend Niceville Florida's nationally lauded event 'Veterans Helping Veterans"! In attendance and showing off everything from simplex to HF was: NOARC, PARC, WCARC, The Navy Amateur Radio Club, and the ARRL, NFL Representative! What a great showing and the people took a lot of interest in what each had to offer and teach about radio communications while encouraging our beloved social hobby!

Can you say Tech Night?! Whoa! Hit that PTT and make it on out to the Walton County ARC every 4th Tuesday at 7 pm located at 312 College Ave in Defuniak Springs! What a superb job as they offered instruction on Amateur Radio Satellites! This club has grown substantially over the last 2 years and continues to build! If you're not having FUN in DeFUNiak, YOU'RE missing out!

WAIT! There's more Tech Night fun! On the following Thursday at NOARC we got to refresh, learn and develop our skills for QSLing! True story here and the methodology was all about how to do this in an online world! This included such topics as: Paper QSL Cards, Electronic QSLing including LoTW and eQSL, Hybrid Forms of QSLing including OQRS, finding QSL routes & addresses, and Use of online sites fir starting logs and other station information (QRZ.com, ClubLog etc..).

We got to end the month in 2 parts! Part 1, Breakfast! That's right! We filled our belly's again with the Walton County ARC in Defuniak Springs! Right after that we went to work with NOARC and help them perform more trailer work to paint prep the club asset! They intend to continue the work now that the temps have cooled off and make their mobile ham shack and emergency response capability dream a reality! Great work to NOARC and all that have assisted thus far in making this a reality adding to the clubs' overall capabilities and direct support to the Entire NW Florida Panhandle and beyond if called upon for assistance! *Don't forget to get your raffle tickets for the WF4X Gun Raffle, contact: philip@n4prc.com

September truly was a productive month! #Hamtober is sure to be even more so and there is no shortage of things to get involved in! Here's a short list of opportunities that you can contact the Clubs about:

- NOARC HAMFEST 14 Oct 2023
- Pensacola Interstate Fair Amateur Radio Booth 19 – 27 Oct 2023
- Bike-a-Thon! 28 Oct 2023
- Crestview Fall Festival, 28 Oct 2023
- PARC Swampfest, 18 Nov 2023

And don't forget about the Meetings, Nets, Tech Nights, and Pileups! There truly are many opportunities to get involved and to be social with our hobby on and off the microphone! Take part and support those who support you in the exceptionally rewarding time to be active!

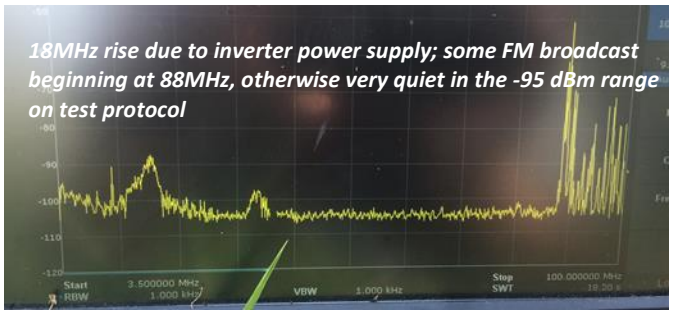
What's up with ALACHUA COUNTY ARES®!

by Gordon Gibby KX4Z

Figure: Satellite photo of new EOC location

Planning for the EOC Move

A huge ancient Army building closer to the center of Gainesville and on 45-foot higher ground has now been purchased and the EOC and the Fire-Rescue Headquarters will be moving. They hope to be IN the facility within 15 months. This is a huge deal for our backup radio comms group. The Emergency Management group consists of FOUR employees and a huge conference room. The Alachua County ARES(R) group has **more than two dozen badged volunteers and another dozen unbadged**.....and



we operate **EIGHT antennas** poking out and around their current building. We have **six different radio systems, licenses or techniques** that are key to our backup comms inside and outside our county to local, state or federal units. So moving our antennas, is an issue.

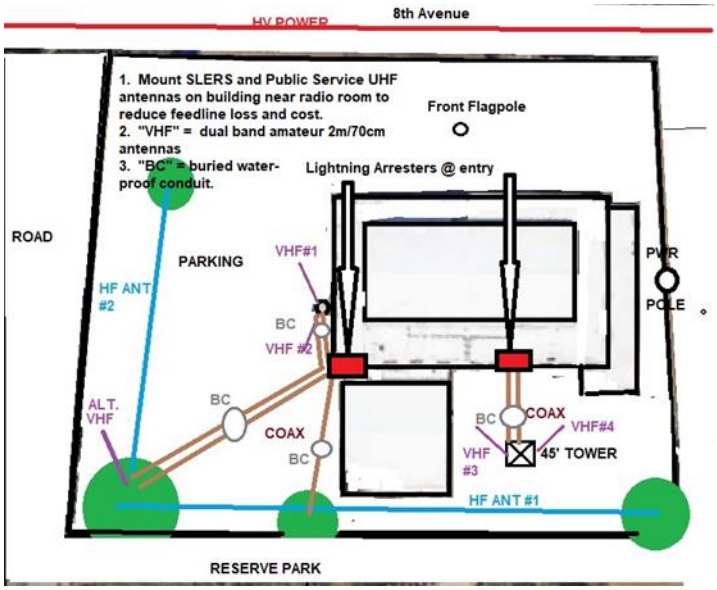


Figure: Proposal for backup antennas

I was lucky to get a personal tour of the new enormous facility by the previous owner. During the cold war, it was used to monitor shortwave comms between Cuba and Russia! Using our published protocol[1], a test antenna and a spectrum analyzer, baseline radio noise measurements were made, demonstrating a quiet RF environment -- at least, *before all the computers get installed.*

So the biggest thing on our radar is effectively communicating to the planners and architects, our big needs for HF, VHF, UHF antennas, redundancy, a TOWER, protected underground cable runs, and the imperative to use effective line filtering on any switching systems for power or air conditioning in the new facility. I was stunned to find that our primary contact at the EOC was unaware that we have FOUR antennas connected to their existing 90 foot tower! We have to get their attention--and $$$. To that end, we have already created two documents. The second is specific for **antennas and noise**. The current draft can be viewed at: https://qsl.net/nf4rc/2023/AntennaProposal3.pdf Our project materials cost is still very modest compared to the amount of Federal Reimbursement that just our volunteer activities can generate.

[1]Ambient Noise Protocol: https://www.nf4rc.club/how-to-docs/radio-frequency-interference-rfi/rfi-ambient-noise-protocol/

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Approved AAR/IP for Hurricane Idalia

At our September meeting, we discussed, amended, and approve our AAR/IP for Hurricane Idalia: https://qsl.net/nf4rc/2023/AARIPHurricaneIdalia.pdf. We write these up for almost *every* significant event or exercise. The improvement plans have steadily made us grow. This 25-page report in standard HSEEP format has 25 problems identified, each with improvement plans. Nine of those are already "completed" as this writing. Putting our problems in writing so we can track our solutions has been key for us.

APPENDIX A

IMPROVEMENT PLAN

Finding	Remedy	Assigned to	Target Completion
1. Only 1 person is getting Flash Reports from EOC	Ask for additional persons to receive flash reports.	Gordon Gibby	COMPLETE Sept 13 2023[7]
2. Unfamiliarity with the EOC satellite phones	Training in an upcoming ARES/NFARC meeting	Leland Gallup	Christmas 2023
3. Batteries weren't shipped along with radio boxes	Both volunteers and EM staff to understand to pair them up	Leland Gallup	October 2023
4. Lack of documentation of where equipment was transferred	Better paper documentation arrangement with EOC	Gordon Gibby	October 2023
5A.Shelter "Go boxes" were not set up for Winlink	(A) Create RJ45 cables to allow go-box ham radios to connect to Signalink or Signalink equivalent; 11 units	Gordon Gibby	September LabNLunch[8]
5B.Shelter "Go boxes" were not set up for Winlink	(B) Survey badged volunteers to find how many can provide a Signalink or equivalent (or an entire digital station + coaxial antenna switch)	Gordon Gibby	*COMPLETE September ARES/NFARC meeting; >= 8 indicated can provide.*
5C.Shelter "Go boxes" were	(C) work to acquire or	Gordon	Christmas 2023

Hilarious LabNLunch! Big Success

One of our big problems if we wished to really provide solid communications including signed reports, logistics, etc., has been the lack of data transfer capabilities (specifically WINLINK or VARA-C) on the county-provided go-boxes in the shelters. We dragged our feet long enough on this. During Idalia, Susan Halbert KG4VWI proved our concept for transferring *signed* ICS-214s (acceptable to the county Documentation Unit, and $$$ in the bank for the county!) works well. In order to leverage our members' wide ownership of laptops and some sort of Signalink-type device, we decided to do a LabNLunch just to build suitable data cables for the county ICOM ID-4100 radios. Two designs were contemplated, one of which had a successful prototype and detailed instructions with photos and drawings ready in time for the event. Oh MY! We had TEN people show up to build and ***we ran out of materials***!

LtoR: Stewart Reissener KK4DXF; Susan Halbert KG4VWI; Jeff Capehart W4UFL; Rosemary Jones KG4VWI

Steve Panaghi KC2ASY- our Web guru was stuck on the end of the breakfast counter.

Manish Sahni KQ4KTE, our newest General!

Our training emphasizes not only OPERATING, but FIXING, because if you're in terribly bad weather....you are on your own. So the nitty gritty of understanding microphones, speakers, connections, wiring, antennas.....is very very key to our training. Susan also diagnosed a failed VHF/UHF antenna during Idalia and created a workaround that succeeded. So having our members literally strip CAT6 cable, and solder connections and understand signal flows....is important to us.

Ever-patient Wendell Wright KN4TWS navigates on while Dave Huckstep W4JIR fetches more materials before they run out!

Our people has a HILARIOUS time and learned all kinds of things. One of our volunteers (**who shall remain nameless**) burst out into laughter at themself when we explained to her/him that there was WIRE inside of those pretty-colored little Ethernet (wires) that s/he had blithely twisted together (with the insulation STILL ON!). They were a great sport about their new-found knowledge. These are EXACTLY the kinds of solid skills we are

Continued on next page...

developing. A new-General Class joined us and he was one of the first to have his cable finished! In all, we built TEN new data cables that ALL have the Alachua-County specific Ethernet pinout [same as for a Baofeng UV-5R or mini-DIN 6pin] , so they will work with ANY of our team's Signalinks no matter what radio a given volunteer has. We have worked this way for years now, so that we have near-total redundancy in that department.

Other Areas Also Growing

Lorilyn Roberts KO4LBS has FOUR 6th and 7th graders pounding away at Morse Code on Fridays during lunch period and doggone it, they may make our demand for 15wpm in time for Winter Field Day! **Go Lorilyn!! Go MIDDLE SCHOOL STUDENTS!!** We are good-naturedly trying to gin up healthy competition with GARS, Loften, and the UF college club (http://www.gatorradio.org/) Matthew Self is doing a great job reviving that club and zooming their monthly meetings for all.

Wendell KN4TWS has tackled our POTA training because there is so much local interest -- and will give our Tech Nite talk on Thursday Oct 5, 7 PM @ https://us02web.zoom.us/j/89530741792 Anyone is welcome. He plans a live hands-on LabNLunch tentatively **Sat October 14th**.

Our QUINTPLEXOR has been a *smash success* and will be a key part of our first-ever Winter Field Day challenge. I was able to give a talk on it to the Gainesville Amateur Radio Society (https://gars.club/) -- https://qsl.net/nf4rc/2023/Quintplexor2023.pdf This is a great club project!

The county has purchased three more of the https://mobilebroadbandkits.com/ very expensive, high-powered internet hot-spots that can use ATT FirstNet or Verizon. They asked us to train more on them -- and our Internet had experienced difficulties at our meeting site, so Wendell KN4TWS, Leland AA3YB, and Eric KO4ZSD pitched in and set the entire system up including the $$$$ tower and directional cell phone antennas, and Cradle Point cellphone/router and WIFI system -- and taught and demonstrated to everyone at the meeting. **Great work, guys!!**

Scouts Looking for Funding for Camp LaNoChe Ham Radio Program

Ken Lyons, KN4MDJ

We're still working on getting funding for our STEM center at Camp LaNoChe. We've applied for several grants but still need a lot more help. So, I have created a Go Fund Me page to raise needed funds that can be easily shared among others within and without the ham radio community.

Jamboree-on-the-Air (JOTA)
Jamboree-on-the-Internet (JOTI)
October

There are very few youth STEM programs with such a focus on radio, it's hoped that hams will help keep their hobby alive while we teach it to the next generation.

In September and October this year we are preparing to display our program to over 12,000 scouts, in three locations, during 6 weekends. By the end of 2024 we'll be presenting before 40,000 youth each year in several locations across the US.

Every Saturday in October are Jota-Like events, we're one of the largest in the country with 8,000 participants that month. For example:

- Oct 7th, Orlando area - [Scouts BSA] 'Sink the Kraken' - Doing a multiplayer game of battleship using CB radios and morse code, plus Jota-like events, with the demo table, morse code and radios.
- Oct 14, 21, 28, Orlando - [Cuborees] Jota-like events, with the demo table, morse code and radios.... may keep the 'sink the kraken' game if it's very popular but many cubs have had trouble in the past.

We need as many helpers as we can for events, some are small with just 100 scouts/day, while others are up to 2,200 youth/day.

Upgrading to a Hustler G7-144 Two Meter Antenna

J. Gordon "Gordie" Beattie, Jr., W2TTT
W2TTT@ATT.NET

Years ago, I had various ground plane and J-Pole antennas on 2 meters for FM simplex, packet radio and repeater access. Somehow, I managed to never put up a Ringo or Ringo Ranger, although many castoff Ringo antennas became aluminum stock for some robust ground planes. Later, I became a fan of Diamond, Comet, et al, fiberglass radome-wrapped monoband and multiband antennas for their convenience in the field, and for secondary antenna use on the VHF-UHF bands at home. Even today, I have a Diamond triband vertical on a thirty foot mast on 146, 446 and 1270 MHz fed by a triplexer that splits out the RF ports for my ICOM IC-9700. It works, and meets the needs. I regularly check into repeaters in Tallahassee over seventy miles away. Simplex contacts without propagation enhancement are routinely made over sixty miles.

When we revived the former W1QBI repeater here in Suwannee County, Florida, we used our existing Diamond X-500A dual band antenna and it performed well until Hurricane Idalia destroyed it. Even with the top third of the radome missing and the rest broken and bent over at the lower third point, the repeater continued to function with a small reduction in coverage. A replacement antenna was needed.

When we lived in New Jersey, I bought a used Hustler G7-144 antenna at the Sussex (NJ) Hamfest for $20 because the aluminum tube sections had seized and wouldn't move. After a few hours of work, I got it freed up, tuned and tested. It lived on top of our tower and mast 67 feet above the driveway from 1991 until 2020. Even with our mediocre location, I would make routine contacts over sixty miles. This experience motivated me to buy one for the repeater.

Why the G7-144 Antenna?

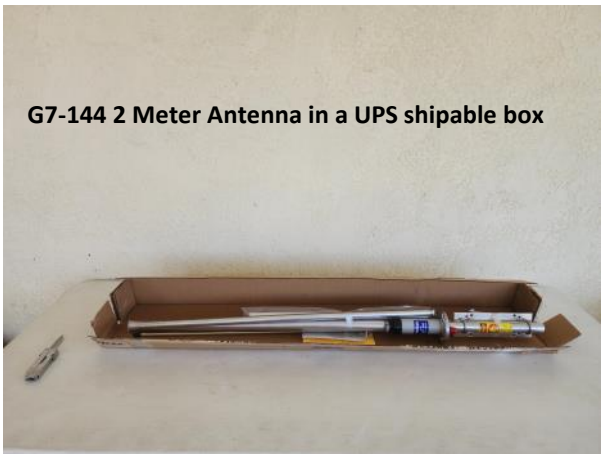
This antenna is not cheap at $300+ dollars, but it is sturdier than most Amateur Radio VHF-UHF omnidirectional vertical antennas with fiberglass radome type of construction. It also has a bit more gain than some of the less expensive alternatives. Additionally, its design yields a lower angle of radiation for that gain which is great for simplex or repeater operation. Its design stacks three 5/8 wave radiators phased and stacked to create that lower angle of radiation which makes for better coverage, both local and DX. Simply looking at antenna gain figures and comparing them is insufficient. Antenna gain up in the air is not as meaningful as antenna gain near the horizon.

Another advantage of this antenna is that it can handle up to 600 Watts of power. In the future, we may relocate the repeater and use another antenna. This will leave me with the antenna for high-power two meter FM contacts.

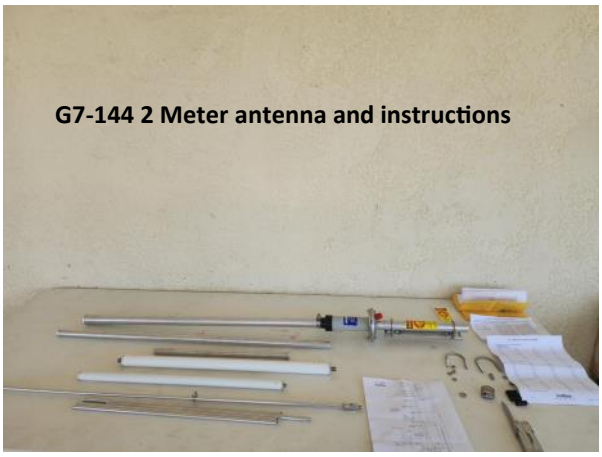
An alternative might be a homebrew extended J-Pole. I've seen and used stacked elements on a single feed J-Pole that lowers the elevation angle and increases gain, but with only two active radiator elements the gain and elevation angle won't be quite as good as the G7-144. You might also consider the "Slim Jim" antenna, but I have limited experience with it on 440 MHz. A Slim Jim is not as big an antenna and will have less effective gain.

Assembling the Antenna

In about three hours with breaks, we went from unboxing, through assembly and then on to tuning and testing. Everything went very smoothly. We laid out the parts neatly and proceeded to follow the instructions and diagrams. It is not "rocket science". A pocket knife, a screwdriver, a rachet or adjustable wrench and a tape measure are all you need for the assembly process.



G7-144 2 Meter Antenna in a UPS shipable box



G7-144 2 Meter antenna and instructions

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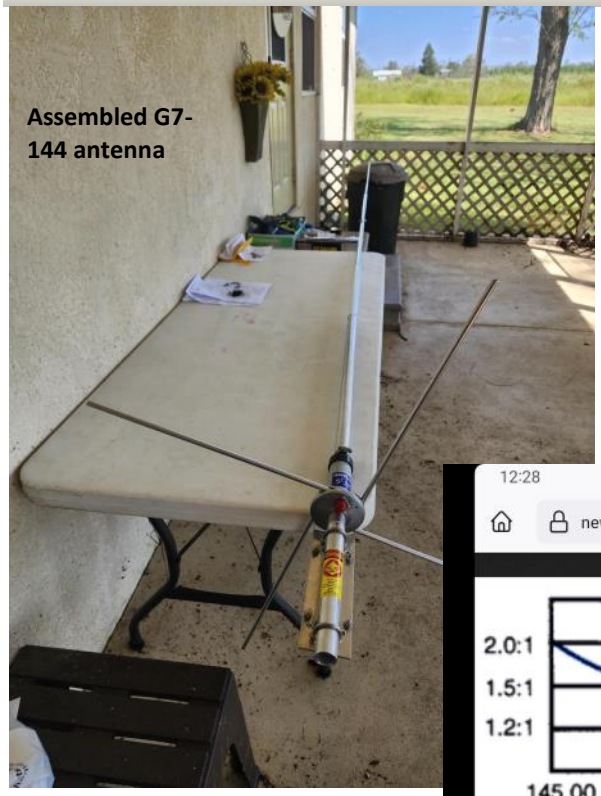
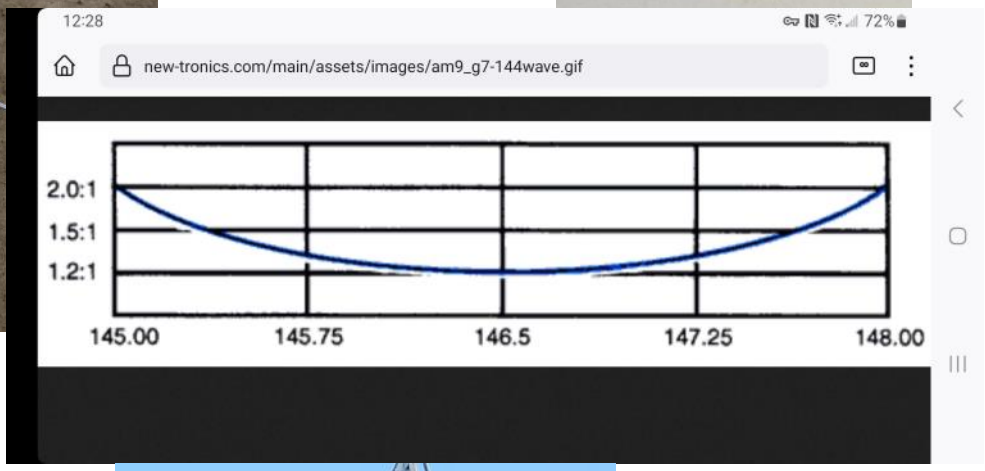
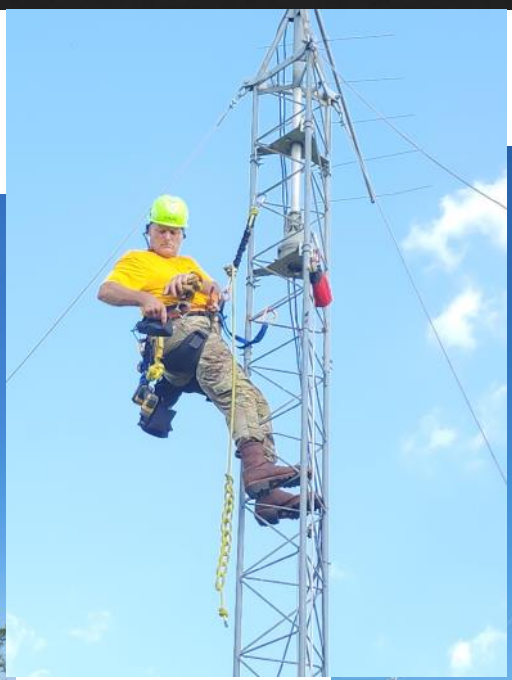


Assembled G7-144 antenna

Right—1-3/4 inch and 2 inch stainless U-bolts

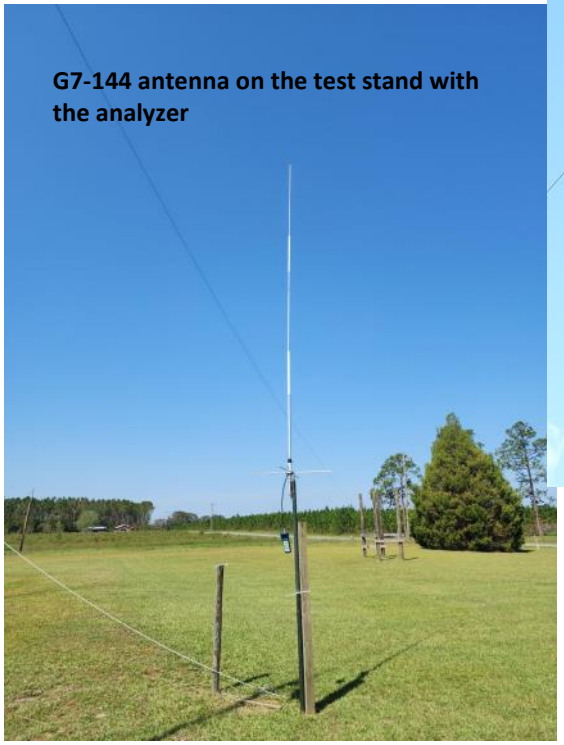
Below—G7-144 SWR curve when tuned for 146.52 MHz





Left & Below—Mark installing the G7-144 antenna

G7-144 antenna on the test stand with the analyzer



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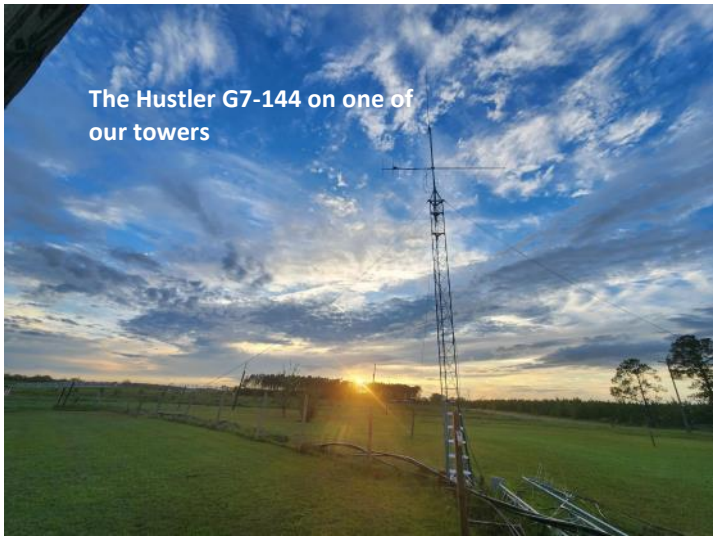
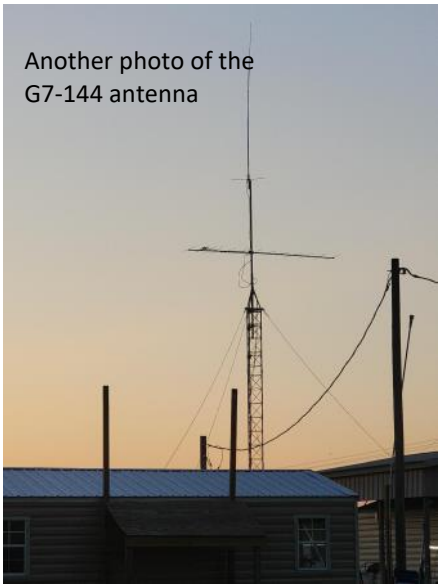

The Hustler G7-144 on one of our towers

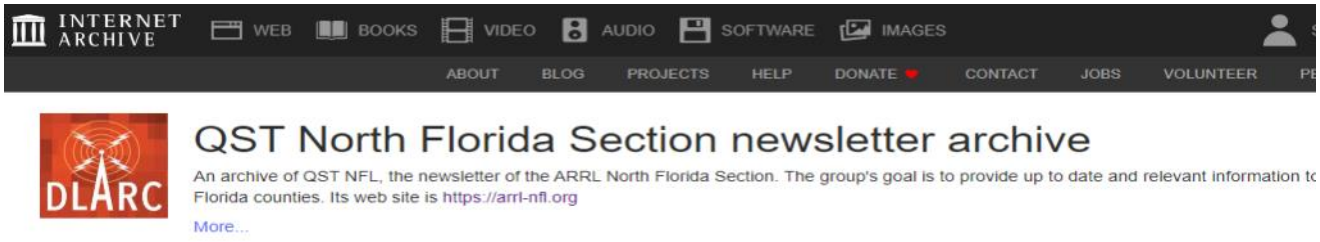

Another photo of the G7-144 antenna

Summary

The Hustler G7-144 has been excellent in its improved coverage and the sturdiness of construction likely to give us years of solid service. If you are traveling in the area west of Live Oak on I-10 or US Rt 90 give a call.

Digital Library of Amateur Radio & Communications

Marty Brown, Editor



Digital Library of Amateur Radio & Communications is now archiving ***QST NFL*** issues. DLARC is a project of the Internet Archive (the not-for-profit online library best known for The Wayback Machine.) DLARC is growing to be a massive online library of the past and present of ham radio and related communications. It is funded by a grant from Amateur Radio Digital Communications. You can see what we have so far at https://archive.org/details/dlarc .

Three years of QST NFL are now online, and I am working with the curator, Kaye Savetz, K6KJN, to eventually get all the issues that I have edited since 2014. DLARC can also scan paper issues. So if you have any stashed in your attic, let me know.

FCC Testing Information

Hog County Amateur Radio Association, Bushnell FL

- First Saturday, 11:00 AM
- Cross Connection Church, 1451 West County Road 476, Bushnell, FL 33513
- Info: sumterVE@gmail.com

Lake ARA, Leesburg FL

- Monthly on the 3rd Saturday, prior to monthly meeting. (Except December)
- 8:00 AM
- LARA Clubhouse (11146 Springdale Ave, Leesburg – off of CR 473)
- For more information and registration, contact: Dave Templeton N4NG, 386-804-2806 n4ng@icloud.com in advance of the meeting.

Lake Monroe ARS FCC Testing, Sanford FL (LMARS)

- Third Saturday of every month
- Seminole County Sheriff's Office, 100 Eslinger Way, 1st Floor, Sanford, FL
- Registration Required
- For more information and registration, contact Bob Cumming, W2BZY, 407-333-0690 or w2bzy@cfl.rr.com

Milton Amateur Radio Club, Milton FL

- Check date at miltonarc.org
- Walk-in
- Bagdad United Methodist Church
- Info: Chuck, N4QEP, merlinman3@yahoo.com

Orlando Amateur Radio Club

- First Wednesday
- 5:30 PM, Walk-ins allowed
- ARRL/VEC
- Central Florida Fairgrounds Craft Building, 4603 W Colonial Drive, East Gate off Fair Villa Road
- Info: testing@orac.org, Robert Cumming, 407-333-0690

Santa Rosa County FL ARES Testing (Walk-in)

- Information and dates can be found at srcares.org

Seminole County

- Every month on the third Saturday
- 9:15 AM
- Seminole County Sheriff's Office off SR 17-92, on 100 Eslinger Way in Sanford, FL
- Info: Bob Cumming, W2BZY, w2bzy@cfl.rr.com

Silver Springs Radio Club, Ocala FL (SSRC)

- Go to http://k4gso.us/class/ to signup for classes
- Go to http://k4gso.us/test-signup/ for testing. Testing is held on the 2nd Tuesday of odd months at 7 PM.
- Note http://k4gso.us/ncvec605/ is requested to be filled out before you show for testing. It is best to download the form and open it as a PDF so you can fill in the blanks.

Suwannee ARC, Live Oak, FL

- Last Saturday of the month
- Suwannee Regional Library
- Contact Gerald Guy, geraldlguy@gmail.com

Tallahassee Amateur Radio Society (TARS)

The Tallahassee Amateur Radio Society (TARS) has begun limited License testing. Please refer to the following for the updated testing dates and requirements for individuals wishing to take exams. ®//www.k4tlh.org/getting-started/license-testing

West Volusia Amateur Radio Society

- Second Saturday of each odd numbered month
- 6:00 AM
- St. Johns Lodge #37, 2557 N. Spring Garden Ave, Deland FL
- Info: https://westvars.org/testing

This information is subject to change. Check with the testing venue to confirm the testing session and requirements.

Statewide Digital Radio Resources

Did you know we have designated ARES DSAR Reflectors & a DMR Talkgroup?

- **DSTAR Reflector 046**
  - REF046A – Florida Statewide
  - REF046B – NFL ARES
  - REF046C – NWS Mobile, AL SKYWARN
- **DMR Florida State ARES TG 31127**

Feel free to link your local repeaters to help create a digital repeater network through the state!