QST NFL

Sharing information of interest to Radio Amateurs in North Florida

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Notice of ARRL Foundation Scholarship application deadline

Mickey Baker, N4MB, ARRL Southeastern Division Director

If you know an amateur in need of help for their college education, there are a number of scholarships available from the ARRL Foundation. Please read Dr. Woolweavers's letter below and encourage those interested to read the qualification criteria and apply before the deadlines!

From: Dr David Woolweaver, K5RAV
President, ARRL Foundation

The ARRL Foundation scholarship application period for the academic year 2021 ends on December 31, 2020. The Foundation issued nearly $300,000 in scholarships for 2020 and for the academic year 2021 there has been a significant increase in the number of large dollar scholarships available thanks to a generous contribution from the Amateur Radio Digital Communication group (ARDC).

For the academic year 2021, there are two new $25,000 scholarships, thirteen $10,000 scholarships, nine $5,000 scholarships as well as dozens of $1,000 and $500 scholarships.

A description of the many scholarships available is on line.
http://www.arrl.org/scholarship-descriptions

It is also very easy to apply as scholarship applications are on line.
http://www.arrl.org/scholarship-application

Since only amateur radio operator students may apply, the chances of being selected for a scholarship are good. It would be a shame for your members to miss this opportunity. Please place a notice in your December Newsletter or send a separate E-Mail to your Division to let your members know that the ARRL Foundation offers over 100 scholarships and it only takes a simple online application to apply.

Since 1973, the ARRL Foundation, with the generosity of many donors and the hard work of a long line of dedicated Foundation Directors, has had a positive impact on the lives of many young amateur radio operator students. To ensure that this positive impact does not wane, I ask each of you to timely notify your members of this opportunity. Being awarded an ARRL Foundation scholarship could mean the difference in whether a student can pursue their education in 2021 or not.

Thank you and the Foundation and I wish all of you a Happy Thanksgiving, a Merry Christmas and a Happy New Year.

What's Inside….

Email your QST NFL input to n4gl.marty@gmail.com
Marty Brown, N4GL, Editor

The Mysteries of HF Radio & Statewide Nets, Part II: The D-Layer & Workable Solutions

by Gordon Gibby KX4Z

In Part I of this discussion, the extreme importance of the Critical Frequency to state-wide communications was explained. The Critical Frequency can be thought of as the "Maximum Usable Frequency" to reach anyone in a nearby city. It tells you the maximum frequency that can be fully refracted 180 degrees by the ionosphere, satisfying the simple up/down geometry required to reach other stations that are only a few scores of miles from your station. Furthermore, it is the main HF parameter that is *measured* continually throughout day and night, every day of the year, by governmental monitoring stations all over the world, and *readily available to all* During the winter of low-sunspot years, at night the critical frequency can drop below 3 MHz (making 75-meter voice nets unable to hear many intra-state stations) and during the daytime it may not even make it to 7 MHz, making 40-meter nets difficult for those fleeing 75 meters.

If you know the current critical frequency, because the geometry of the globe and the ionospheres are well described, simple math can predict the maximum usable frequency for any desired distance. (The MUF is critical frequency divided by the secant of the incidence angle required by the geometry.[1])

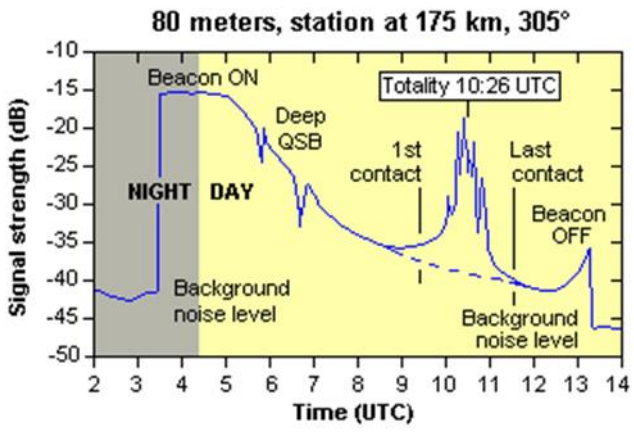
"MUF Boost Factor"[2]									
Take-off angle	90	80	70	60	50	40	30	20	10
Multiplier of critical frequency	1.0	1.02	1.06	1.15	1.31	1.56	2.0	2.9	5.8

Moving To The D-Layer

In this paper, the second most important ionospheric effect, absorption of signal energy by the D-layer, will be explained.[3] The D-layer is a lower layer in the ionosphere. Ionization is created by incident solar radiation (that made it past the higher ionospheric reaches), principally **visible and UV light.** Thus the ionization starts up at daybreak, reaches a peak around local solar noontime, and then wanes into the late afternoon, and usually disappears shortly after sundown. The rapid disappearance is because the density of air molecules is still significant at the 50-80 km height of the D-layer, so recombination of ions and electrons occurs at a good pace, requiring continuous incident sunlight to maintain ionization.[4]

The D-layer is crucial because the fields of a radio wave traversing this layer cause energy-robbing movement of those ions. The effect is much, much worse with lower frequencies. Some say that the absorption is inversely proportion to the square of the frequency – a very strong frequency impact, badly damaging lower frequency signals.

Exactly how great is this absorption? Because the D-layer is so dependent on continuous sunlight, eclipses have provided valuable chances for measurement of D-layer absorption. Data show that the impact of the D-layer on 80 meter radio waves is in the range of **25 dB loss for a round trip of a nearby station's signal**. Anecdotal data on 160 meters suggests 35 dB. Loss at 40 meters is still significant but much less, and by 20 meters, there is insignificant effect. You can easily make simple measurements to confirm these figures by observing the signal of a ham friend 20 or so miles away, on 80 meters, at local solar noontime, as compared to an hour after sunset. The difference will be significant.



Real-time measurement of D-layer absorption changes during an eclipse have been measured as shown in the figure to the left:[5]

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Explanation: The beacon in darkness was received with a signal strength of approx -15 dB. As the sun rises higher, the signal strength declines markedly. But as the moon begins to obscure the solar irradiation at about 0930 UTC, the beacon signal level begins to increase due to a decrease in D-layer absorption. At totality of eclipse, the signal has become roughly 25 dB stronger; then as the eclipse begins to wane, D-layer absorption begins to return and the signal again fades. ["Contact" in the graph refers to moon in front of sun.] Beginning at about 1230 UTC the beacon begins to become stronger likely due to the passage of local solar noontime. The beacon turned off at about 1330 UTC.

Quantified D-Layer Absorption Points to State Net Solutions

Let's consider how this very practically affects state-wide HF nets. If the twilight signal from a net participant was only 10 dB above the background noise (sufficient for voice communications), adding 25 dB of additional loss at local solar noon will move that station's signal now 15dB BELOW the noise level making noon-time voice communications completely impossible. Moving to higher frequencies reduces the D-layer absorption – but again there is a hard limit! Going higher than the **critical frequency** ends up with zero signal. Thus during the daytime, a statewide net is caught between D-layer absorption on lower frequencies and critical frequency limits on the higher frequencies. This can be a very tight trap to amateur radio stations with limited bands from which to choose, and helps explains the development of the Amateur Radio RELAY League.

However, the D-layer is a quantifiable ***non-total*** obstruction (different from critical frequency effects). The 80 meter loss is on the order of 25 dB. Adding more transmitter power will make the signal stronger. Amateur radio operators can often increase their transmitted signal strength on the order of 10 dB by simply adding an amplifier. **However the greatest asset is probably improved modulation and detection techniques.** *Low-signal techniques, modulations that have a lower signal level threshold for success, provide a significant tool to conquer D-layer absorption*.

Pieter-Tjerk de Boer, PA3FWM and other researchers and developers have provided valuable work in quantifying the signal-to-noise threshold of multiple types of signal modulations.[6]

Approximate SNR required for message passing by various modulation modes	
Mode	Typical Necessary SNR @ 2500 Hz receiver bandwidth **NOTE: These are not exact numbers.**
SSB voice	+10 dB
CW	-12 to -26 dB, various measurements
RTTY	- 5 dB
PSK31	-10 dB
Pactor 3	At least as good as -10 dB based on published Figure 9.[7]
Pactor 4	-18 dB @ 2400Hz[8] -20 dB (@ 4kHz)[9]
JS8 (using FT8 original modulation)	In the range of -18 to -20 dB (@2500Hz)[10]
JT65	-24 dB
Theoretical Limit	Somewhere around -57 dB

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[1]https://www.electronics-notes.com/articles/antennas-propagation/ionospheric/maximum-lowest-critical-optimum-usable-working-frequency.php
[2]Redrawn from Table "MUF Boost factor" in http://www.astrosurf.com/luxorion/qsl-eclipse-d-layer.htm

[3]D-layer absorption has been recognized and studied since at least 1957: https://www.sciencedirect.com/science/article/abs/pii/002191695790154X
[4]https://www.arrl.org/files/file/Technology/pdf/119962.pdf
[5]http://www.astrosurf.com/luxorion/qsl-eclipse-d-layer.htm
[6]http://www.pa3fwm.nl/technotes/tn09b.html
[7]https://www.p4dragon.com/download/PACTOR-3 Protocol.pdf
[8]https://ecfsapi.fcc.gov/file/1216070429696/SCS_FCC_reply_sollenberger_WTB16-239.pdf
[9]https://www.scs-ptc.com/en/PACTOR-4.html
[10]https://tapr.org/pdf/DCC2018-KC5RUO-TheReal-FT8-JT65-JT9=SNR.pdf

Section Emergency Coordinator Message

Karl Martin, K4HBN, k4hbn@arrl.net

By the time you read this, the 2020 hurricane season will be over. Saying this year was an abnormal season is saying it lightly. With COVID-19 and an active hurricane season, this has been the busiest year I have been involved in ARES. The last time was the hurricanes in 2004. 2020 will be a year for the record books.

The Section didn't reach activation level I Full Activation, but we did have the section reach level II Partial Activation several times. With every activation, I was impressed with how many people participated. Those who could deploy went to shelters and Emergency Operation Centers (EOCs). Others operated from home or other locations. No matter how you helped, I appreciate you coming out for your community.

HF conditions were one of the most challenging communications in this year's activations. Luckily we had a dedicated team of Net Control Stations (NCS) and Relay stations all across the state of Florida and in some cases across the nation. Some stations operated for hours with only a few hours of rest. In a section the size of the Northern Florida Section, it would be practically impossible without these stations. Thank you.

Over the past years after hurricane Michael, Florida has improved our skills, training and professionalism. I am proud of everyone that serves their served agency, neighbors and community. I am incredibly impressed with the one that has chosen to go above and beyond the necessary level of ARES Level I and challenged themselves to reach ARES Level II or ARES Level III.

To learn more about ARES Levels, download the Florida ARES Task Book, contact your county Emergency Coordinator (EC) or myself.

https://arrl-nfl.org/knowledge-base/florida-ares-training-task-book/

Remember, no one is alone. We all work at training as a team. Without a strong and active team, we couldn't do what we do.

Thank you to everyone for the hard work and dedication during the past year, and I hope for a better new year.

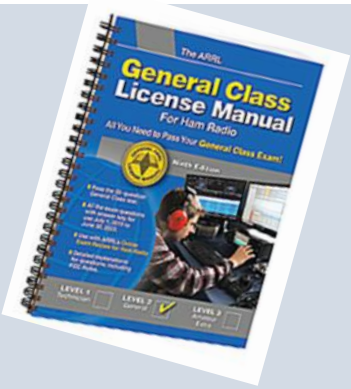
Five Flags ARA Completes Fall Term

Gene Bannon, KB4HAH

Five Flags Amateur Radio Assoc-W4UC (FFARA) has completed its Fall term class this past Tues (17th Nov). We now have 3 New Techs and 3 New Generals added to our community. The classes started Sept 8th and ran till Nov 17th with the VEC testing on the 17th of Nov. We had 11 students of which only 8 took the test, with 6 passing to get their new/upgraded license. Even with some obstacles (Hurricane Sally and the coronavirus) we were able to make adjustments to the course to get it all taught and tested. We are now looking forward and planning toward getting everything ready for our 2021 Spring term starting Feb 16th. Here are some class Pics of our course this term.

NOARC Remote Classes for the General License

Michael Behr, W4BZM



The North Okaloosa Amateur Radio Club (NOARC) will hold classes for the General license beginning in January 2021. Classes will be held remotely, via the Zoom application. Our current intention is to hold classes from 6:30 PM to 9:30 PM (with breaks) Central Time on the following dates in 2021:

January 25
February 1, 8, 22
March 1, 8
Mach 15 – tentative test under WCARS VEC

We will be using the ARRL General Class License Manual, 9th Edition. A Zoom account will be required, available free from zoom.us.

NOARC's home location is in the Florida panhandle, but during a previous Technician class, we had students from out of state (Alabama) and in other time zones (Tampa area). So don't let geographic separation be a limiting factor.

Interested in participating in the classes? Please contact one of the following instructors prior to the **sign-up deadline** of **Thursday, 07 January 2021**.

Mike, W4BZM w4bzm@arrl.net
Bruce, KA5DLV badams138@yahoo.com

What's happening? Santa Rosa County Edition

Arc J. Thames, W4CPD, Emergency Coordinator, Santa Rosa County FL ARES

October

For the second month in a row, Santa Rosa County ARES was activated following their monthly ARES meeting. Emergency Coordinator, Arc-W4CPD, took the opportunity at the October 24 ARES meeting to recognize those who had volunteered to assist with the Hurricane Sally activation as well as review the after-action report.

Pictured– John-KM4QQO receiving his certificate of appreciation from EC Arc-W4CPD

Pictured– EC Arc-W4CPD presenting on the Hurricane Sally Activation

Pictured– Ed-K4PFL presenting on his experience operating at the shelter during Sally

By the afternoon of Tuesday October 27, it was evident that Santa Rosa County would potentially receive impacts from Hurricane Zeta and the county made the decision to activate a shelter for those who didn't feel safe at their homes. We also took the opportunity on our Tuesday evening ARES net to test our simplex capabilities between stations inside and out of Santa Rosa County. This information will be extremely useful to know what portions of our area can be reached in the event of a repeater outage.

One of the items we had identified in our Sally after action report was that the process of providing shelter statistics was being done by us either hand carrying or emailing notification to Emergency Management staff once we received it over radio from the shelters. Working with the local EM team, we have now been provided the capability to update shelter information directly in the state's WebEOC system.

A huge thanks to Arc-W4CPD, Jack-W4JPH, Jon-KM4QQO, Ed-K4PFL, Hal-WA5HC, John-KM4FJN, and Ray/Daisy-K1HG/KT4KW for assisting at the EOC and shelter during Hurricane Zeta.

November

At our November meeting, Arc-W4CPD, presented more detailed instructions on utilizing Winlink and the team participated in hands on training using the new laptops that the Santa Rosa County Department of Emergency Management donated to the ARES team. We also participated in the American Red Cross Winlink exercise by sending a message to the southeast ARC clearing house using one of the 2 Winlink packet gateways in Santa Rosa County.

Pictured: Ed-K4PFL, Pat-KK4NDY, Steve-W4SJV, and Roger-KK4QMI

Santa Rosa County now has two Winlink packet gateways, W4CPD-10 on 441.000 and K4SRC-10 on 145.090. We encourage our ham community to utilize these gateways for practice with Winlink packet as well as emergency communications.

We need help! If you are in the Santa Rosa County area and willing to volunteer for shelter operations or to present on a topic at our meetings, please contact our EC Arc – W4CPD at arc.thames@srcares.org. There will not be a Santa Rosa County meeting in December but we will be participating in Winter Field Day on January 30/31 at Bear Lake Campground in Munson, FL.

We're looking forward to a great 2021 and hope that you will join us in our journey in supporting our community and encouraging participation in the hobby!

Alachua County General Class Review – Success!

By Gordon Gibby KX4Z

Antenna UnUn Builders with their successful creations – all were checked with a 2500 ohm "load" with great SWRs.

In spite of the virus, North Florida Amateur Radio Club (ARES ® support club) carried out a 2-Saturday General Class Review course, Nov 14/21—with full masks! 15 hours of multiple instructors using improved ARRL slides and as much hands-on as we could muster! Then a mass HF antenna building followed by EXAMS – 3 took the General Class and passed, 1 spouse passed the Tech.

This is always a chance for us to grow new leadership, as well as give folks a chance to learn more, and often grow our group. We had a great cast of instructors, including Leland Gallup AA3YB (regulatory & operating), Jim Bledsoe KI4KEA (enthusiastic propagation section from a DX'er), Charlie Amico W1CBR (encouraging stories of successful HOA antennas), and Earl McDow K4ZSW (sober safety section!). Participants got up-close-&-friendly with upper sideband, CW, lower sideband and FM emissions in demo sessions with a spectrum analyzer, got to hear and watch all kinds of ham QSO's from near to far, on just about every mode. We even had them watching sidebands created in a balanced modulator and squashed by a crystal filter – and got to see 3rd and 5th order IMD products! The antenna building project was a whirlwind creation of eight ununs of the 49:1 type as well as 130 foot antenna wires all cut and terminated. This gave a well-appreciated hands-on of how inexpensively high performance systems could be created. Our back-to-back measurements on the homebrew un-un indicated losses less than ¾ dB over several ham bands. Soldering, wrapping, winding – all great experiences.

Three out of the four General Class participants felt "ready" and sure-enough, the VE team lead by Allan West WA4JD found that all three PASSED. A spouse of one of the students made it in and passed her TECH at the same section.

We divvied up the time based on the number of questions per section, started each day at 9AM and finished at 6PM. The "schedule" can be seen here: https://qsl.net/nf4rc/2020/GeneralClassSchedule.pdf Teaching in something like this is one of the items on the Florida ARES® Taskbook (https://arrl-nfl.org/wp-content/uploads/2020/01/Florida-ARES-Training-Task-Book-2020-R1.pdf) and is a great way to serve your community. Likely that we will do the Extra Class review next year and hopefully a Tech course as well.

QRP Labs 50-watt HF Amplifier

Bert Garcia N8NN

Sometimes 5 watts QRP is just not enough to have fun. QRP Labs offers a 50-watt HF amplifier kit for their QCX QRP transceiver. At $29.50 for the amplifier (1) and $16 for the optional case (2), plus shipping, that's a pretty good deal! Figure 1 shows my completed amplifier with a dollar bill to illustrate the size and the end panels.

Figure 1: QRP Labs 50-watt HF Amplifier

The amplifier can be built for 80m, 40m, 30m, or 20m. I chose 40m to match my QCX-40. All components are through-hole mounted, and you will need to wind the toxoids. No surface mounted components are included. A comprehensive 67 page manual is available on-line (3). I advise you print the manual to make assembly easier. To obtain 50 watts output with 5 watts input, you will need a 20 volt power supply. If you use only 13.8 volts, the output drops to about 25 watts. Perhaps this should be called a 25-watt amplifier!

Fast full break-in QSK operation is provided. The amp PTT keying line requires +5 volts, so the amplifier is not readily compatible with other QRP transceivers without building an interface circuit to provide the +5 volts needed for PTT. The QRP Labs QCX transceiver is easily modified to provide the +5 volts keying, and this is explained in the manual.

Using SSB is not an option as this class-C amplifier is designed for CW and it is not linear.

Looking inside the amplifier in Figure 2, you can see the six toroids that you will wind and all the components are shown except the two IRF510 final transistors. The final transistors are installed with the case before they are soldered to ensure a correct fit. This is not an easy process, and it took me two tries to get it right. On the first try I allowed some smoke to escape due to poor soldering technique, and one final transistor had to be replaced.

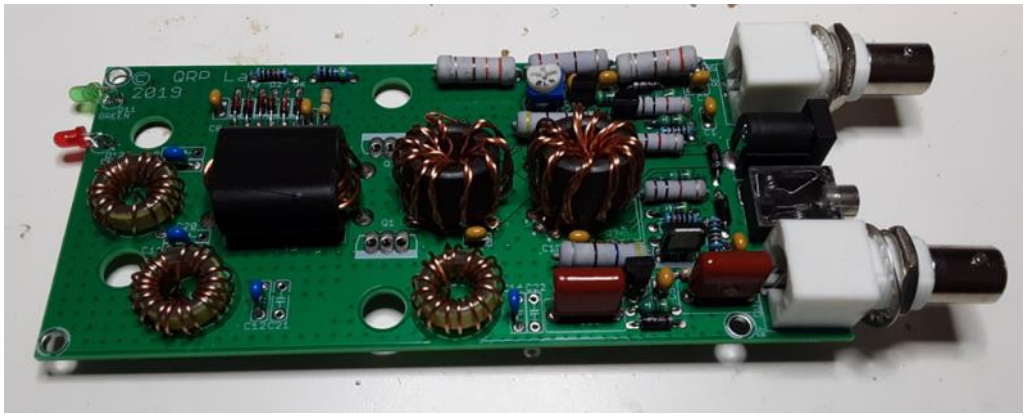


Figure 2: Completed circuit board ready for final assembly.

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This was a fun kit to build. Boosting a QRP transmitter up to 25 watts is a significant increase. If you add a 20 volt power supply, you can run a full 50 watts. This is a nice weekend project.

References:
1. QRP Labs 50-watt HF amplifier https://qrp-labs.com/50wpa.html $29.50 plus shipping.
2. 50-watt amplifier enclosure https://qrp-labs.com/50wpabox $16 plus shipping.
3. Assembly manual https://qrp-labs.com/images/50wpa/QCX_PA2q.pdf

NFARC Improved 49:1 End-Fed Half-Wave Antenna Balun

by Gordon Gibby KX4Z

With our General Class Course, we built a total of 9 additional copies of our improved design for the end-fed half-wave 49:1 balun (technically an "un-un"). This is a wonderful project to get a multiband antenna for the lower HF bands at very low cost. This is also an excellent emergency deployment antenna. It can be connected to very fine nearly-invisible 22-24 gauge wire and used in situations where you don't want to bother the neighbors, since the feedpoint is at ground level and easily covered. Here are details:

We did a previous project using smaller FT-140-43 toroids, suitable for power up to about 50 watt range; this time we've stepped up to the **FT-240-43 toroid** and our balun on workable bands should be usable into the 300-400 watt range (SSB). We used one of these during Field Day last year at 150W digital for the entire contest with very good results. Toroids can be easily obtained from Diz at: https://www.kitsandparts.com/

Optimized for lower bands: Our balun uses 3 turns on the primary and 21 turns on the 2450-ohm secondary, which optimizes for 160meter – 20 meters. Testing of two "back-to-back" baluns with a spectrum analyzer showed impressively low losses from 50-ohm resistive sources, in the range of 0.65 dB up to 14 MHz. (If you want more "high end" switch to 2 turns on the primary and 14 turns on the secondary (our original specification) and tinker with the input capacitor (suggest 100 pf, 1 kV silver mica) We'll test this eventually.) With our current design, SPACE OUT THE SECONDARY WINDING to take up much of the toroid circumference – one of our builders really spaced out those turns and **had good results into the 15 meter band** while most of our more-closely-spaced versions pooped out after the 20 meter band. (The far white turns in the accompanying photo are WAY TOO CLOSE and this makes more inter-turn capacitance and limits the high end usable frequency.)

On the lower frequency end, ALL our designs with 3turns/21 turns showed good SWR into a 2500 ohm dummy load right through the 160 meter band.

Antenna Wire: This feeds an END-FED 130 foot length of wire, and will work to some extent on ALL multiples. (65 foot wire would work 40 meters and up.) The SWRs are sometimes "great" and other times only "usable". Manufacturer plots show multiple bands under 2:1 but we've sometimes seen more like 2.5-3. Depends on your antenna placement apparently. So using a TUNER may still be advisable, but the huge advantage here is that **you can feed this at ground level using regular 50 ohm coax with relatively low loss on multiple bands into a simple wire and ground**. A dog-leash spiral ($4) suffices for ground in this high impedance feed point. This is one of the SIMPLEST antennas that offers multi-band performance without taxing a tuner much at all, that we've ever built.

Construction information for this inexpensive group project can be found here: https://qsl.net/nf4rc/2020/ResonantEndFedUnUnConstructionManual.pdf Our next-best alternative (which offers better usage on odd-ball SHARES frequencies) is the Guanella-4:1 balun fed off center dipole: https://qsl.net/nf4rc/2019/BalunArticle.pdf – which we also used with the same success in Field Day.

Happy building!!

Trailer Hitch Mount HF Antenna Testing, Part 2

Darrell Franchuk, KG4CCB

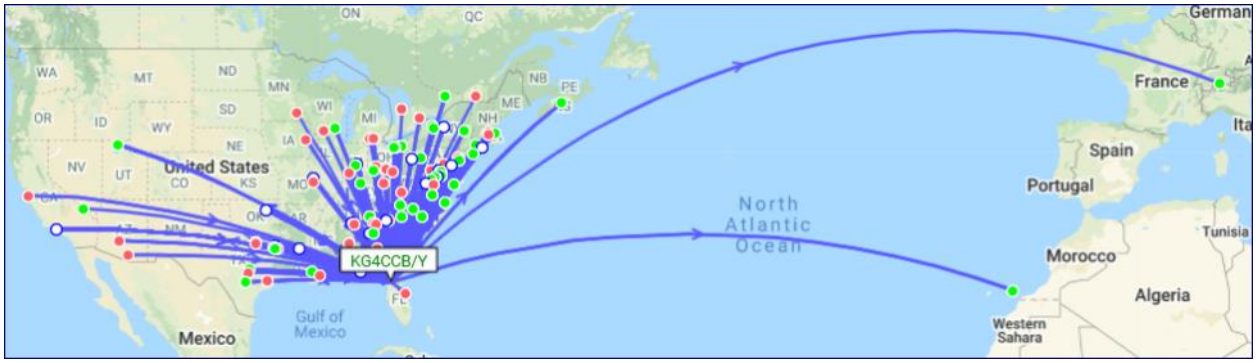
In the previous episode, I described the rationale for, and process of, testing a 20-meter Ham Stick antenna in a trailer hitch mount. Since I had a reasonable, and surprising, amount of propagation success with that I decided to follow up with a similar test with a 40-meter Ham Stick. During this new round of testing I did not use all four compass orientations as previously but chose to do only SE and NW orientation which previously yielded the best results. Following is a results summary. Transmission cycles are not fully comparable due to varying shut-down times (morning versus evening, for example) because of nighttime sleep and times away from home.

Transmissions

Orientation	Total Spots	# Hours	Distribution	Most km	Least km
Southeast	842	18.5	U.S., EU, Canary Isles	-	-
Northwest	679	13.5	U.S., CA, PR, EU	7778	343

Receiving

Orientation	Total spots	# Hours	Europe	Other DX	Most km	Least km
Southeast	916	24	0	0	3772	199
Northwest	1188	24	0	1	3493	241



Combined transmit / receive with 40m Ham Stick in Hitch mount vehicle aimed SE

Having determined that the 40m Ham Stick antenna performs moderately well (domestically anyway) in the trailer hitch mount, I then compared the Ham Sticks against Hustler RM-20 and RM-40 coil loaded whips in a rooftop magnetic mount. I chose to stick with NW orientation. Sample results maps are provided below that illustrate 20-meter and 40-meter comparisons.

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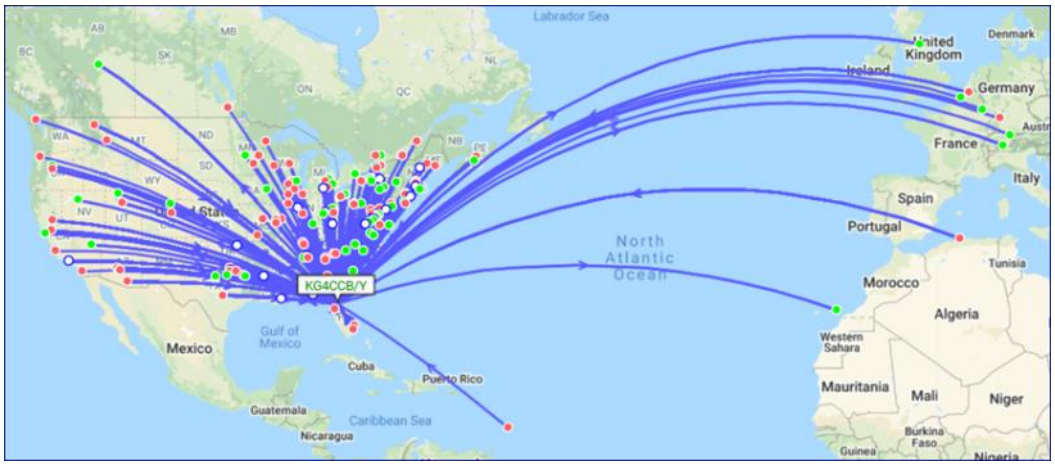
Transmitting

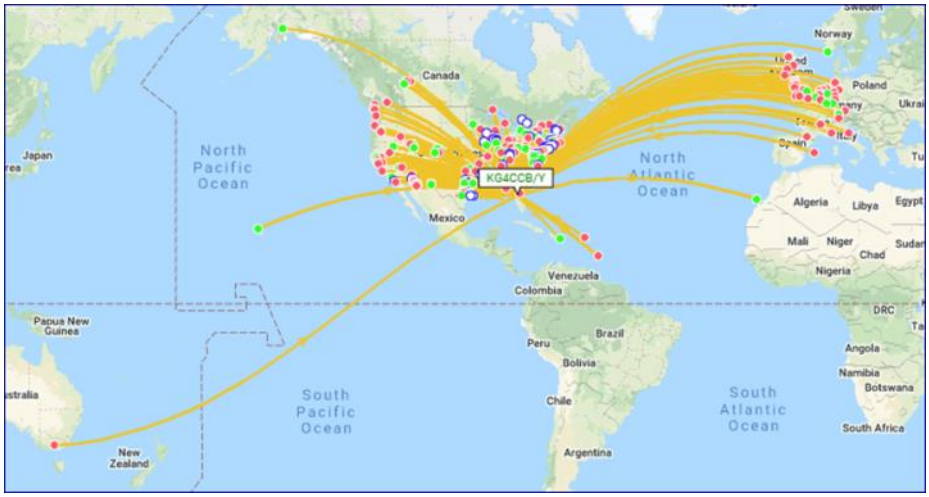
Orientation	Spots Total / per hr	# Hours	Distribution	Most km	Least km
20m HamStk	1730 / 102	17	US, CA, 8-EU, Canary Isles, PR, HI	7799	925
20m Hustler	930 / 98	9.5	US. CA, EU, Caribbean, Aus-tralia	7600	925
40m HamStk	862 / 75	11.5	US, 3 EU, Canary Isl	7799	343
40m Hustler	1367 / 83	16.5	US, 3 EU	7778	338

Receiving

Orientation	Total spots	# Hours	Europe	Other DX	Most km	Least km
20m HamStk	2240	24	38	3	15589	123
20m Hustler	2442	24	17	8	18264	211
40m HamStk	2151	24	2	1	7721	78
40m Hustler	1497	24	3	0	8161	199



Combined transmit / receive with 40m Ham Stick in rooftop Mag Mount



Combined transmit / receive with 20m Ham Stick in rooftop Mag Mount

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Finally, I considered the antenna height relative to the Forester roof, comparing Hustler antennas in roof top mag mount and Ham Sticks in trailer hitch mount. The roof is approximately 51-in above the Trailer hitch antenna mount.

Antenna	Overall Length	Height above roof	Transport length
20m Ham Stick	95-in	43-in	50-in
40m Ham Stick	91-in	40-in	50-in
Hustler 20m	50-in	52-in (with mount)	29-in
Hustler 40m	67-in	69-in (with mount)	45-in

The Hustler antennas extend as much as 29-in more than the Hamstick antennas above the vehicle roof. The Ham Stick extension above the roof is like the height of Diamond 2m / 70cm antennas, which are commonly 36-in to 40-in plus the luggage rack motorized mount which will add a few inches.

In summary, the test results indicate the following:

- More spots are realized with NW orientation of the vehicle, likely due to the presence of more receiving / transmitting stations on land than at sea.
- Use of the Ham Sticks in the roof top mag mounts is practical with the vehicle parked somewhere, but not while in motion.
- Summary comparative data is provided in the table below.

Antenna	Mount	Transmit spots/hr	Receive spots/hr
40m Hamstick	Trailer Hitch	40	27
20m Hamstick		70	24
40m Hustler	Rooftop Magnetic	83	62
40m Hamstick		75	90
20m Hustler		98	102
20m Hamstick		102	93

- The 20-meter Hamstick in the trailer hitch mount is less effective than the 20-meter rooftop configurations. On the rooftop, the two antennas are comparable.
- The 40-meter Hamstick in the trailer hitch mount is less effective than the 40-m rooftop configurations. On the rooftop, the two antennas are comparable.
- As a reference, the average of 88 receive cycles conducted at home with various permanent vertical and dipole antennas consists of 1,440 spots, 64 spots /hour, 12 spots in Europe, and greatest distance of 8,004 km. On occasion 24 hour receive sessions have realized 4,000 to 5,000 spots at rates of 150 to 250 spots/hour.
- SSB performance will not be the same as WSPR performance.

CONCLUSION

The trailer hitch Hamstick antenna configuration will provide sufficient performance to justify installing an HF rig in my Forester in addition to a 2m/70cm rig and a 2m/70cm antenna on a Diamond motorized mount on the luggage rack. The trailer hitch mount / Hamstick will be put in place when HF communication is needed or desired. The coax will be 'permanently' installed. The Hamsticks should be usable with the vehicle in motion. The antenna connection near the trailer hitch for the Hamstick will also provide a convenient way to connect an external dipole or vertical when parked for a field exercise.

I expect to use Sound Depot & Performance in Gainesville to install the radios and cables, plus my dashcam power cord, for a professional installation (on the recommendation of the Levy County ham with the nice pickup). Now I just need to select the radios … recommendations are welcome.

SILVER SPRINGS RADIO CLUB 2020 HAMFEST

Saturday, December 5, 2020

FIRST CHRISTIAN CHURCH

1908 EAST FORT KING STREET, OCALA, FL 34471
DOORS OPEN AT 7:30 AM

SPECIAL NOTE:

Due to current COVID-19 Restrictions, face masks/coverings are required by City of Ocala while attending the Hamfest. Attendees must bring own face masks and will need mask to buy a ticket. Temperatures will be taken at door to gain entry. Table layout designed to promote social distancing and avoid overcrowding. Inside occupancy may be limited to avoid overcrowding. SSRC will follow all applicable official restrictions.

Grand prize and door prizes

Grand prize ticket is separate from door prize ticket. Both are available at the door only! Admission ticket stub good for door prizes only. No online sales

Grand Prize

XIEGU G90 HF SDR, CE-19 & Cooling Fan

VE TESTING - one session @ 10:00 am, Green Clover Hall 319 SE 26th Terrace, Ocala, FL - 1/2mile east of the Hamfest in the McPherson Governmental Complex. Look for road sign! Bring two forms of ID, FRN if issued and FCC License if upgrading. Test Fee $15 cash.
Test slots are limited. Preregistration is recommended at K4GSO.US

Commercial vendors - Main Hall only
TOWER ELECTRONICS
SIGNMAN OF BATON ROUGE
HAMWORLD
J T COMMUNICATIONS
PARADAN RADIO
CCTV ELECTRONICS
NITEFIRE ELECTRONICS

Active military and first responders in uniform and kids under 12 free. Must buy tickets for Grand Prize and door prizes.

Inside flea-market tables in adjacent hall & under semi-covered overhang areas subject to social distancing restrictions. All outside flea market locations on a first come first served basis.
(BRING YOUR OWN TABLE & CHAIRS)

Food and drinks available for purchase from Scout Troop 439

TALK-IN ON K4GSO VHF 146.610 PL 123 -

GENERAL ADMISSION	$10
TAILGATE – CAR & DRIVER	$20
ADDIIONAL TAILGATE SPACE	$10 each
ADDITIONAL PERSON	$10

MORE INFORMATION ON THE SSRC WEBSITE: WWW.K4GSO.US/HAMFEST

FCC Testing Information

4 Corners Radio Club, Davenport FL

- First Saturday
- 10:00 AM
- Polk County Firehouse, 50945 US 27
- Walk-ins welcome
- Info: WA2FRW@aol.com

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)

Cancelled until further notice due to loss of venue because of COVID 19

- For more information and registration, contact Bob Cumming, W2BZY, 407-333-0690 or w2bzy@cfl.rr.com

Milton Amateur Radio Club, Milton FL

- Second Thursday of each even numbered month
- 6:30 PM
- Walk-in
- West Florida Hospital Rehab Institute, 8383 N Davis Hwy, Close to Johnson and N. Davis
- Info: Robert Speser, nb8s@icloud.com

Orlando ARC FCC Testing (OARC)

Cancelled until further notice due to loss of venue because of COVID 19

- Info: https://oarc.org/events-ve-testing

QCWA Chapter 45, Orlando FL

- Second Thursday
- 11:00 AM
- Golden Corral, 5535 S. Kirkman Ave, Orlando
- Walk-ins welcome
- Info: WA2FRW@aol.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

- First Tuesday of the month prior to the meeting
- Saturdays available with advanced notice
- N4SVC, 9707 58th Street, Live Oak, FL 32060
- www.suwanneearc.org for more information

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. https://k4tlh.net/faq/license-testing/

West Volusia Amateur Radio Society

- Second Saturday of each odd numbered month
- 9:00 AM
- Elks Lodge, 614 S. Alabama Avenue, Deland, FL
- Info: https://westvars.org/testing

Remember: Bring photo ID, CSESs, copy of current license, exam fee in cash, $15 exact change. Large print exams are available.

Due to the COVID 19 restrictions on gatherings, please check with the organizations listed for changes or cancellations.

NFL Web Site

For net, hamfest and other events go to www.arrl-nfl.org. Webmaster Brian McClure, NW4R, maintains an up-to-date and detailed listing of all NFL nets and activities. If you need to make a change to an existing net or activity, or add a new one, you can contact Brian on the website.

NFL Officials

Section Manager – *Kevin Bess, KK4BFN*

Assistant Section Managers

Joseph D. Bushel W2DWR
John C Reynolds W4IJJ
Dave Davis WA4WES
Jeff Capehart W4UFL
Neil Light KK4VHX
Ray Crepeau K1HG
Steve Szabo WB4OMM

Section Emergency Coordinator – *Karl Martin K4HBN*

Section Public Information Coordinator— *Scott Roberts KK4ECR*

Assistant SE Coordinator – *Dave Davis WA4WES*

Section Technical Coordinator – *Frank Haas KB4T*

Affiliated Club Coordinator – *Appointment Pending*

Section Traffic Manager – *Helen Straughn WC4FSU*

Official Observer Coordinator – *Robert Leasko WB8PAF*

State Government Liaison – *Darrell Brock N4GOA*

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!

Newsletter of the Northern Florida Section of the ARRL

1.Spread the word about our website www.arrl-nfl.org and ***QST NFL*** on your club web-site, in a newsletter or at a meeting.
2.Send a write-up and picture of your next activity.
3.Make sure you, or the appropriate member of your club is on the email reminder list.
4.Contact: Marty Brown N4GL, n4gl.marty@gmail.com

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 writers 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.