



*North Fulton
Amateur Radio League
NFARL eNEWS*

December 2017

*Celebrating 40 Years
Service | Friendship | Education | Fun*

www.nfarl.org



HAMJAM BREAKS RECORDS !

HamJam IX is now history, and what an event it was! After expenses, the NFARL Youth Education, Scholarship and Activities (YESA) fund grew by over \$7,200 - our best yet! Our street value prize pool exceeded \$10,000, our attendance was up, the new venue at Mill Springs Academy was superior in many ways, and our speakers left us with many thought-provoking and challenging ideas.

The first speaker was Bob Schmieder, KK6EK. Bob gave us his thoughts on the "Future of DX", and predicted that the melding of the many new technologies, social concerns and environmental issues in the future would drive the implications of DX in a more significant and meaningful direction. Bob was so enamored with HamJam and all the thoughtful comments and questions he got that he said that "HamJam was the best event of its kind he had ever been to" and compared it favorably over HamCom in Texas! Bob chose to donate all of his expenses to the HamJam cause, well over \$800!

The second speaker was Ward Silver, N0AX. Ward challenged us all to become better, more efficient operators by getting to know our equipment and practice using it. His ultimate fitness test is becoming more proficient in Radiosport and likened it to going to the gym and working out. He gave us numerous examples of improving our skillset, including reading the manual (RT*M)!

The third speaker(s) were Dan Henderson, N1ND and Dan Davis from ARRL Headquarters. Dan talked about "Lifetime Learning" and its importance to the future of our hobby, as well as the programs that are being fleshed out at the League to enable ham radio to be viable in the future. They also offered several tips on staying connected to newcomers to the hobby and helping them get involved at higher levels. Dan presented the truly startling statistic that 70% of newly licensed hams never make a QSO.

The "Icing on the Cake" were the introductory remarks kicking off the event from League Headquarters by Tom Gallagher, NY2RF, the new CEO of the ARRL. Tom thinks that the HamJam -type of ham radio event will become more popular in the future, as the appeal of boneyards and its' customer base is starting to wane.

In case you could not make it to HamJam IX, or just want to review and refresh your memory on

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the speaker's comments, the PowerPoint presentations of all the speakers, along with videos, will soon be available on the NFARL web site. Additionally, the YESA committee is putting together a method to access funds for youth education, scholarships, and activities for all metro Atlanta Clubs in case help is needed to fund youth-related projects.

Looking forward to seeing you next year at HamJam X!

73, Wes – W3WL

A Great Year! / Mark Schumann, KK4FOF

2017 was another great year for NFARL! The club had a Technician and General HamCram, monthly VE sessions, the club placed 1st in attendance and 3rd place nationally in Field Day class 3A and HamJam exceeded expectations with over \$10,000 in ticket sales and over \$10,000 in prizes. NFARL also had key roles at the Atlanta Science Fair, Makers Faire, support for Mill Springs, the FAST school and the local hamfests.

The NFARL Holiday party and the final NFARL 40th Anniversary celebration was last weekend! Everyone that attended enjoyed an evening of delicious food, festive decorations, a slide show of NFARL pictures and a chance to relax and reminisce with their fellow club members and family. The party was a team effort and I would like to thank Tony, K4AWF, and his son for arriving mid afternoon to set up tables and chairs, Martha, Fred, Lori, Jim N4SEC, Tony, and many others for helping with setup and decorations.

At the Holiday Party, I had the honor to present Terry Joyner, W4YBV, the NFARL Ham of the Year award for his outstanding contributions. Terry was a founding member, served on the executive team in various capacities and has been instrumental in growing the club over the last 40 years! Over the last two years, Terry has spearheaded the National Parks on the Air Club contest in 2016, US Islands Awards in 2017 and this year's 40th Anniversary celebration. Please join me in thanking Terry for all of his contributions and congratulating him for being awarded NFARL's *Ham of The Year!*

I would also like to congratulate the 2018 Executive Team who took office on December 16th:

President - Daryl Young, K4RGK
Vice President - John Tramontanis, N4TOL
Secretary - Martha Muir, W4MSA
Treasurer - Fred Moore, N4CLA
Activities Chairman - Mark Coleman, KJ4YM
Membership Chairman - Pavel Anni, AC4PA

It has been an honor and a privilege to serve as NFARL's President for the past two years and I look forward to serving as a past president in 2018! I wish everyone a safe and happy holiday with your family and friends! I look forward to seeing everyone at the January meeting!

Happy Holidays !

73,

Mark Schumann, KK4FOF

NFARL Past President

NFARL Upcoming Events and Dates

- **Every Sunday — NFARES net** - 8:30 PM - 147.06 MHz (+) PL 100
All licensed Hams are welcome, you do not need to be an ARES member!
- **Every Monday — Tech Talk** - 8:30 PM - 145.47 MHz (-) PL 100
NFARL's flagship technical based "non check-in" net. The net is always better when using the web based chat room but Internet is not required to join the net. Check NFARL Nets [website](#) for "how to".
**** Tech Talk will not take place on Monday Christmas Day ****
- **Every Wednesday — Hungry Hams Lunch Bunch** - 11:15 AM
Slope's BBQ, 34 East Crossville Road, Roswell.
- **Every Thursday — YL Net** – 8:00 PM - 145.47 MHz (-) PL 100
Check NFARL Nets [website](#) for "how to."
OM's (guys) are welcome to listen in to this YL net.
Great opportunity to get your YL's on the radio!
- **Every Saturday — Royal Order of the Olde Geezers (ROOG) Lodge No. 1**
9:00 AM - Reveille Café, 2960 Shallowford Road, Marietta (at Sandy Plains and Shallowford). Everyone is welcome: You don't have to be "old" or a "geezer" to join this breakfast get-together.
- **Second Tuesday — NFARES Meeting** - 7:00 PM - 9:00 PM
Fellowship Bible Church, 480 W. Crossville Road, Roswell.
Check [NFARES.net](#) for more information.
- **Third Tuesday — NFARL Club Meeting** - 7:30 PM.
January 16, 2018, 7:00 PM
Program : TBD
Meeting location: [Alpharetta Adult Activity Center at North Park](#)
13450 Cogburn Road, Alpharetta, GA 30004
- **Fourth Tuesday — NFARL Executive Team Meeting**
Postponed - Date TBD, 7:00 PM
Location: [Arbor Terrace at Crabapple](#)
12200 Crabapple Road, Alpharetta, GA 30004
Meetings are open to all NFARL members. Space is available on a first arrival basis. Please contact the [President](#) to ensure available space.

10 Meter Contest 2017 / John Kludt, K4SQC

Not sure why but one of my favorite contests has always been the 10 meter contest. Maybe it's because I like VHF and 10 meters is "almost VHF." Maybe it's because when the band is open it does not take much to work the world. The antennas are of a manageable size and you don't have to go very high to get to the magical $\frac{1}{4}$ wavelength. Maybe it is because the band usually goes dead in the middle of the night and I can sleep without worrying about what I am missing! Who knows, it is a good little contest.

My station is modest, very modest. At 100 watts I am in the "low power" category. That's anything greater than 5 watts but less than 150 watts. I have two antennas, a vertical and a Moxon. The Moxon is kind of interesting in that it is a two element Yagi with the ends folded toward each other. It does offer some gain and it has a nice null off the back. To keep the HOA police happy mine only comes out for the contest and sits on a 25 foot push up fiberglass mast on the back deck. Below the roof line, of course!

I am learning N1MMLogger+ and this seemed an ideal occasion to learn about the built in voice keyer and the spectrum scope. Both work great and were really easy to set up. If your radio has an IQ output the spectrum scope is a really useful feature. It is big as you want it to be on your monitor and if you see a signal it is "point and shoot."

So with high hopes I set up for the contest the weekend of 9-10 December 2017. I did note with some concern that there were no sunspots being reported by spaceweather.com and the [KQ7HQ website](http://KQ7HQ.com) rated 80/40 propagation as "Fair" during the day and "Good" at night. Everything above that? Poor! But, hey, as a well-known NFARLer likes to say the SWR was less than 10:1 so I called "CQ."

As many of you know I do a fair amount of VHF contesting. On 222 MHz the Q rate is a little slow, about 1 an hour average. Why does that matter? Because I was well trained for this weekend.! There was no propagation. The contest started at 0000 UTC on Saturday, 1900 local on Friday. Surely the South Americans would be there for a while – no joy. Well things will be better on Saturday. I did work one gentleman in Decatur, GA. And so Saturday went. One of the real questions is "How often should I cycle my voice keyer?" Some guys put a very few seconds between the CQ's. Their theory is if you are not out there constantly no one will hear you. There is this great line in the movie "The Hunt for Red October" something to the effect that the Russians searching for Red October "...are traveling so fast they could run right over them and not even hear them." I have heard people try to call back and unless they are really fast on the PTT, the station calling "CQ" is right back at it before they can even get their call out. Then there is the 30 second crowd. And I do agree that unless I tune real slow when I am playing search and pounce (S&P) I can run right by them and not even know they are there. So I usually pick something kind of in the middle, say 10 seconds between "CQ's."

As I write the contest has 2 hours and 12 minutes more to go, but who is counting? KC4TVZ is still calling "CQ" otherwise the band scope is empty. There was little propagation this morning. I did manage to somehow work Maine and Virginia. Signals were there and then they were gone. Tropo, sporadic, very sporadic E's? Part of the fun of 10 meters and VHF is trying to figure out with which propagation mode contacts were made. I can tell you whatever it was it was not F2 propagation! With any luck I might make 10 Q's for this contest. And I had a good time. I

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did establish that with patience a minimal station can make some Q's. I learned a lot about N1MMLogger+. I did some running with the voice keyer and played S&P for a while. I am much more comfortable that a good band scope can be as useful as a spotting network and you can still go in the Unassisted category.

The experts say we are two or maybe three years to the bottom of the current sunspot cycle. Whoa! So what will next year's 10 meter contest be like? Hard to tell because 10 meters can be just like 6m with lots of other propagation modes, some of which are more dependent on the weather than they are on sunspots. And you can always work a few satellites. Rumor is we may have one soon that is a 10m up/15m down (or maybe the other way around) satellite. We have not seen one of those for a few decades! And that would be another fun use for 10 meters.



K4SQC 10 Meter Moxon

Happy Holidays to All !
From the NFARL Board of Directors & Executive Board



Mill Springs Academy WWII Festival / Martha Muir, W4MSA

Amateur Radio was the star at the Mill Springs Academy World War II Commemorative Festival held on November 29 in the same room that HamJam was held just two weeks prior. The students in one of the divisions at Mill Springs came up with displays on some of the key figures of the era and then stood by their trifolds, often in costume, to explain the significance of who they 'were' and answer questions. Among the notables present were Joseph Stalin, Eleanor Roosevelt, General Patton, and Winston Churchill. A trio of 'USO' singers entertained those present with songs popular during the 1940's. But the main hit at the festival were the hams who came in to show how Amateur Radio had an impact during that war.



Pavel AC4PA and Mike AD4MC (yes, that's right, Mike) had students practice 'sending' CW, primarily spelling out their names. Pavel also showed the students some simple ciphering techniques used to make Allied signals more difficult for the enemy to understand if they happened to pick it up. Alford Memorial RC members Steve N4TTY and Nick NONCQ brought in two of their TTY behemoths and had the students fascinated by showing them the ferocity of those machines and allowing them to type in messages. One young student, the young man in the white shirt in the photos above, was totally mesmerized by the machines and hung around helping his classmates effectively run the machines. He was at this station 40 minutes or more.



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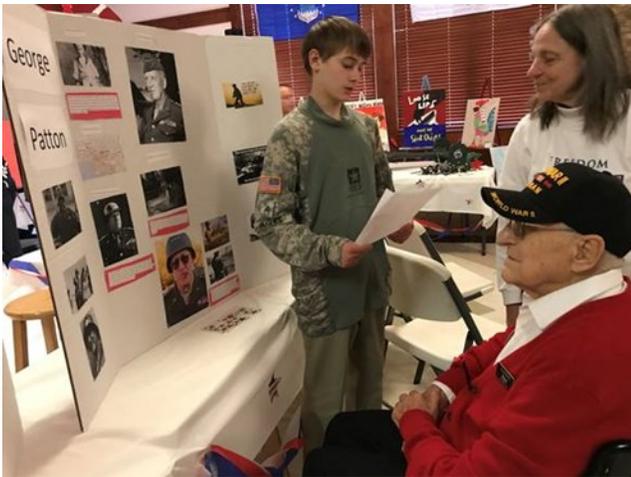
The real highlight of the festival was the appearance of WWII Army Air Corps veteran Lt. Ray Schwartz K4GRR. His daughter, Arlene KE6GFI, brought him in to tell stories about his work during the war where he served as the radio communications officer aboard transport planes that flew equipment and troops over to Europe from their base in England.

Set up in one of the classrooms near the other activities but quiet enough so that folks could converse with him and listen to his stories, Lt. Schwartz caught the attention of endless streams of students, faculty,

parents, and even Steve and Mike, who took a break from their main room duties to have a chat with Lt. Schwartz. All of the interviews with Lt. Schwartz were recorded but unfortunately the audio recordings did not pick up Lt. Schwartz's delicate voice very well.



Towards the end of the festival time, Lt. Schwartz and his daughter ventured in to the main festival room and investigated what was going on. He was drawn straight away to the students portraying General Patton, Anne Frank, FDR, and Harry Truman. He then spent some time playing CW with Pavel.



Several of the adults associated with the event gushed that 'ham radio really made this festival come alive.

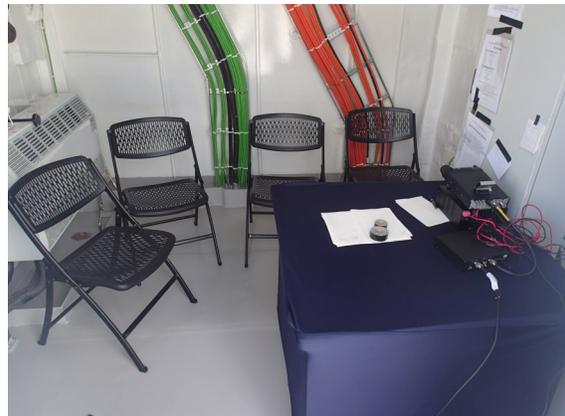


Thanks to all of our ham guests who did an excellent job, once again, bringing aspects of ham radio to the students, faculty, and parents of Mill Springs Academy.

Fun on the Seas - QCWA 2017 Cruise! / Terry Joyner, W4YBV

In October the QCWA had it's 70th Anniversary cruise aboard the MS Koningsdam. The 11 day Caribbean cruise had stops in Antigua, Barbuda, Guadeloupe, Martinique, Saint Lucia and St Kitts. We had a blast with some 55 hams and wives from all over the U.S. and Canada. Back in March QCWA obtained permission from the MS Koningsdam Captain to set up a 100 watt or less HF station aboard and to use hand held radios 5 watts or less for the 11 day cruise.

I was asked by the QCWA President, Ken Oelke, VE6AFO, to be in charge of setting up a station and antennas aboard the ship.



Ms KONINGSDAM
Tonnage: 99,836 Gross tons
Length: 975 Ft.
Capacity: 2,650 passengers
Crew: 1036

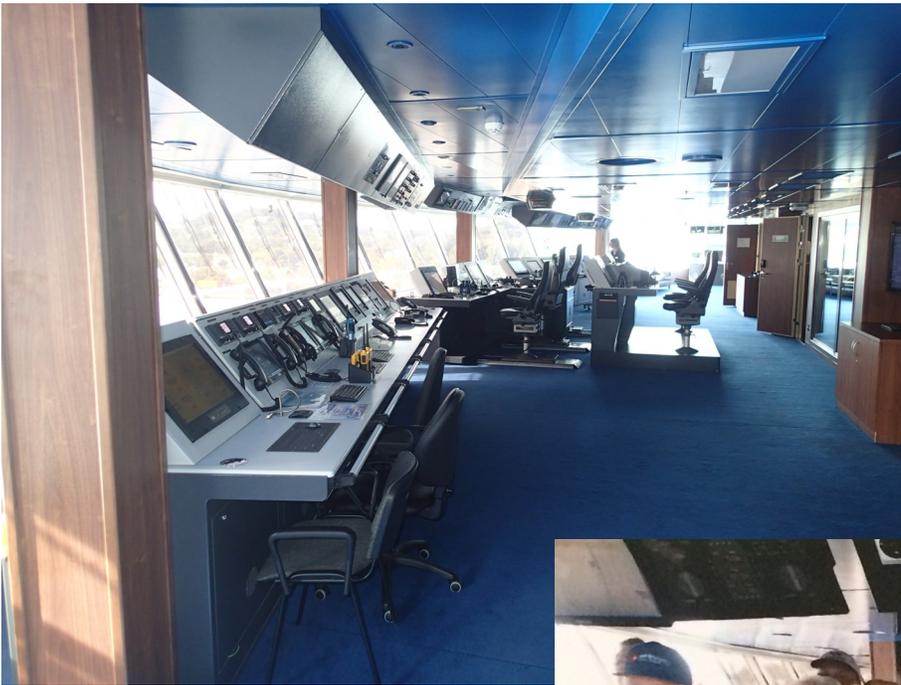
My station of choice was my Yaesu FT 857-D along with a 20-M dipole and a 40-M dipole. The radio room they gave us was an 8 Ft. by 8 Ft. room on deck 14 on the forward section of the ship. The small room was very cozy with 4 chairs, a table, power outlets and air.

Working with the ships crew we were able to get our antennas high on the top of the ship just below the two high power radar antennas hoping to keep the noise to a minimum of S4 to S5.

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I was given a key to the radio room and had to make sure the door was locked when the station was not in use. This meant I had to be available at all times day and night. During the cruise most of our members got a lot of operating time making world wide contacts for all.



On the fourth day of the cruise I arranged for a private tour for our group to see the Emergency Bridge on deck 14 and the main Bridge on the deck 8. This was the highlight of the trip for some members.

As for my contacts over the 11 days using my call PA/W4YBV/MM I worked a lot of DX and a lot of QSO's back in the states.

Over the next year or two I would like to see if any club members would like to plan a NFARL radio cruise like this one.

This 11 day cruise runs around \$1700. per person.

Terry, W4YBV



A Little "bit" of history...

The internet is fast, almost too fast. Consider the days when dial up modems ruled and we poked along at 56 thousand bits, we thought it was fast. We'd even call the phone company and blame the poor, aging copper plant outside when the connection speed was only getting 28,000. In today's world, internet can be over 20 million bits or more for a homeowner, if you're lucky and live in a neighborhood with fiber deployments, it can go faster than a billion bits per second (1 gigabit), the sky is the limit. It's a modern miracle that every computer and phone on the planet is literally connected together, forming what we call the Internet. We are all dependent upon it.

What makes it all work? Simple! Information is broken up into 1's and 0's we know as digital bits. By encoding a stream of bits on one end of the transmission and decoding it back into bits on the other end, information can be conveyed. Both sides must agree on how these bits are modulated, transferred, and demodulated. That is where the word "Modem" (modulator/demodulator) comes from. Following a particular technique on how this is done is called a Protocol. Hams use a protocol named AX.25 and a measly 1,200 bits on VHF.

But we are hams...we say so much with so little...

As a ham, let's say you want to send the word "NFARL" between two hams using bits across the ether. First, we need to translate "NFARL" using a look up table that evolved from telegraph code, which can easily be found on the internet. NFARL translated in this manner is:

N= 0100 1110 F= 0100 0110 A= 0100 0001 R= 0101 0010 L= 0100 1100

Simple enough, just like the decoder ring found in Caption Crunch cereal we turned text, one byte (8 bits) at a time, into 1's and 0's. Putting it together we get a payload of 40 1's and 0's, or 40 bits:

| 0100111001000110010000010101001001001100 |

Whew! We could stand on a mountain top with flashlights, switching it on (1) and off (0), someone would decode the hypnotic blinking into "NFARL". If your brain tried to decode that with Morse Code it would be the wrong protocol, we would get gibberish. A Committee named X.32 in 1960 got together and came up with a chart of all the capital letters A-Z, lower letters a-z, and numbers 0-9, added some extra characters and named it ASCII (American Standard Code for Information Interchange). There hasn't been a revision since 1986, that was the last meeting. The whole internet uses character encoding. It's all text, always has been, even pictures and files are sent as text! Text is all that can be sent, just characters- even if its hypertext. (HTTP)

Now that we have the 40 bit representation of "NFARL"...what do we do with it, how do we transfer it? What is sending and receiving anyways? Imagine a group of people on mountain top, each with a flashlight to send and receive messages with. We'll call them "modulators" because of their thumbs on the light switch, ready to flip the switch at any time. When they want to send a 0, the flashlight switch is off; while sending a 1 is switching the flash light on. Soon it

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begins to look like lighting bugs with bad allergies with everyone turning flashlights on and off. No one can tell which flashlight is doing what anymore. Someone needs to sort this out, and that's how the AX.25 (Amateur X25) standard was born in 1983. They decided to "frame" our payload using our call signs. Therefore, let's pretend that KW4HQ (Steven) sends the 40 bit payload of "NFARL" to W4QO (Jim).

KW4HQ|0100111001000110010000010101001001001100|W4QO

Drats! We can't actually send call signs; therefore, we must turn it to ASCII first. Gah! Back to the lookup table again to convert these call sign characters into bits.

K= 01001011 W= 01010111 4 = 00110100 H= 01001000 Q= 01010001
W= W01010111 4= 00110100 Q= 01010001 O= 01001111

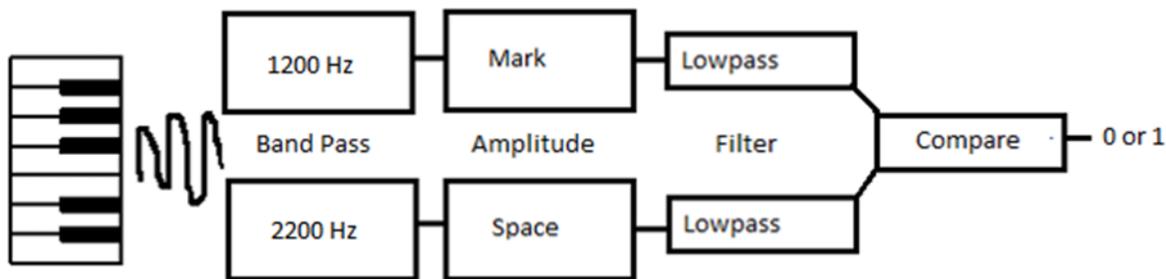
Now that we have both call signs encoded, let's put it all together in a string of 112 bits in total.

0100101101010111001101000100100001010001|0100111001000110010000010101001001001100|0101011001101000101000101001111

Wow, 112 bits! This is perfect for sending a bit after another, serially, over a serial port. But is it a packet? Actually, there are many more items to add to the frame to make a packet, it is a lot more bits than just the 112 we talked about. For the basic understanding just know that call signs and payloads are involved to get information thru the ether. So, let's replace the modulators (the volunteers who turn the flashlights on and off real fast on the mountaintop using our bits) with.... a Terminal Node Controller, or TNC.

A little KISS of TNC goes a long way...

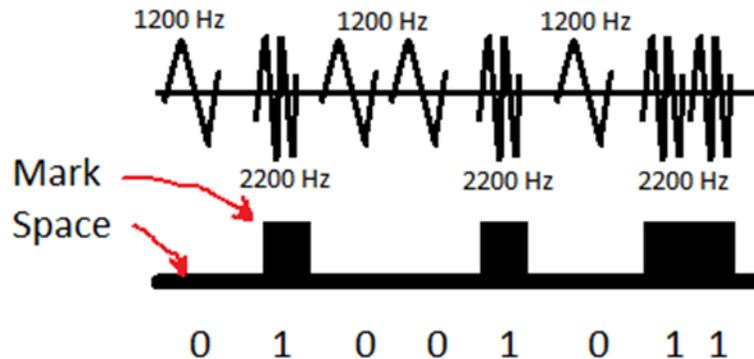
A terminal node controller (TNC) is a device, either software or hardware, that is used by hams. It uses the AX.25 protocol by implementing a modem to convert the bits mentioned above to audio tones. Now that we said the word audio tones, we may as well get another acronym out – AFSK. That stands for Audio Frequency Shift Keying, which in laymen's terms mean "Dump the flashlights on the mountain top with uhmmm...uhmmm...a piano instead. I can't tell if you're sending a 0 repeatedly or if you have arthritis in the thumbs with that flashlight, therefore strike a low-pitched key at 1200 Hz to sound a 0 and a high-pitched key at 2200 Hz for a 1". Sounds about right, right? Ask Bell Laboratories, they figured on those two tones and called it a Mark and Space, to mean 1 and 0. Its named Bell 202. We are interested in the amplitude of those 2 piano keys, therefore our demodulator which can be either hardware or software, should look like this:



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Let's take a simple look at demodulating the ASCII letter K into a waveform using the diagram above. Recall that K= 01001011. Now we can see a 1200 Hz tone, then a 2200Hz tone, 1200, 1200, 2200, 1200, 2200 and ending with 2200. We can visualize it and see the mark and spaces, the 1's and 0's.



So how can I get one of these modulators/demodulators? One way is with Hardware. It is very expensive, some of the ones out there are the Pactor type ones, costing over \$1,000. Some people use Raspberry PIs and Arduinos and have great success. I went the software-based route using two popular software TNC's out there. One is named Soundmodem and the other is named Direwolf. (Decoded Information from Radio Emissions for Windows or Linux Fans). What these TNCs do is take your soundcard and expose it as a web server to other apps in KISS (Keep it simple) mode, performing the duties of a real TNC.

The digital parrot that repeats

Use the VFO on our rig and set it to 144.390 Mhz. That is the nationwide frequency for Automatic Packet Reporting, an easy way of using your first TNC. Within a few minutes you should hear the 1200 baud packet bursts, stations all day long beacon various things; such as weather reports, GPS movement of a ham in a vehicle, announcements, alerts, etc. You'll also need to download Soundmodem or Direwolf. Extract Direwolf to a folder (there is no install) and start it up. This one is my favorite of the two and is actively being developed.

A digipeater has somewhat of an easy job, it listens for a packet and simply repeats it, like a parrot. This is so you don't have to have a large antenna to do anything (in most cases). Let's take a look at setting up Direwolf to listen to the local digipeater on 144.390Mhz, which is very active in the area. The interface to Direwolf is just text. Remember, this is replacing a hardware device that has just LED's on the panel for the most part. Make sure audio from your rig can get to your computer thru a soundcard.

```
C:\Users\steve\OneDrive\Ham Radio\APRS\direwolf-1.4-win\direwolf.exe
Dire Wolf version 1.4

Reading config file direwolf.conf
Available audio input devices for receive (*=selected):
 * 0: Microphone (2- USB Audio CODEC ) (channel 0)
   1: Microphone (High Definition Aud
Available audio output devices for transmit (*=selected):
 * 0: Speakers (2- USB Audio CODEC ) (channel 0)
   1: Speakers (High Definition Audio
Channel 0: 1200 baud, AFSK 1200 & 2200 Hz, E+, 44100 sample rate.
Ready to accept KISS client application on port 8001 ...
Ready to accept AGW client application 0 on port 8000 ...
```

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On startup there isn't much to see. Note the asterisks * next to my sound cards, that's that from the IC-7100 rig. That's it, it is ready to start decoding packets from the digipeaters. If you do not have asterisks next to your soundcard, open the direwolf.conf file with notepad and uncomment the card you want to use by removing the pound signs. After a few minutes, we are flooded with packets.

```
Select C:\Users\steve\OneDrive\Ham Radio\APRS\direwolf-1.4-win\direwolf.exe
Dire Wolf version 1.4

Reading config file direwolf.conf
Available audio input devices for receive (*=selected):
 * 0: Microphone (2- USB Audio CODEC (channel 0)
   1: Microphone (High Definition Aud
Available audio output devices for transmit (*=selected):
 * 0: Speakers (2- USB Audio CODEC ) (channel 0)
   1: Speakers (High Definition Audio
Channel 0: 1200 baud, AFSK 1200 & 2200 Hz, E+, 44100 sample rate.
Ready to accept KISS client application on port 8001 ...
Ready to accept AGW client application 0 on port 8000 ...

Digipeater N4NE-2 audio level = 13(6/6) [SINGLE] _:::___ 1
[0.2] KD4UYP-10>APMI06,N4NE-2*,WIDE2-1:@260421z3407.19N\08409.51W&WX3in1Plus2.0 TX igate U=14.0V
Position with time, I=Igte IGate R=RX T=1hopTX 2=2hopTX, SQ3PLX http://microsat.com.pl/
N 34 07.1900, W 084 03.5100
WX3in1Plus2.0 TX igate U=14.0V 3

Digipeater N4NE-2 audio level = 14(6/6) [SINGLE] _:::___
[0.2] K4TQL-4>APTW01,W4GVX-10,WIDE1,N4NE-2*,WIDE2-1:!3409.07N/08445.88W_WXTRAK
Didn't find wind direction in form c999.
Didn't find wind speed in form s999.
Didn't find wind gust in form g999.
Didn't find temperature in form t999.
Weather Report, WEATHER Station (blue), Byons WXTrac
N 34 09.0700, W 084 45.8800
, "WXTRAK"

N4NE-2 audio level = 14(6/5) [NONE] _|:::___ 4
[0.1] N4NE-2>APRX29:!3414.21NI08409.59W&SARA iGate on Sawnee Mountain
Position, Igate Generic (please use mor, <39 for OH2MQK's igate
N 34 14.2100, W 084 09.5900
SARA iGate on Sawnee Mountain
```

Let's break it down:

Light green = raw packet as is.

Dark Green = The audio levels and signal quality. What is interesting is the text meter, like _:::___ meaning it's a little off to the left. Think of it as text-based waterfall.

Blue = Pretty text for the raw packets in light green. This is why I like DireWolf. Most other apps/hardware will only show the raw packet.

Red = errors for that type of packet. In this case, the weather report was missing data.

Other things to note (remember, only the light green is the packet, everything else is determined by code based on the packet:

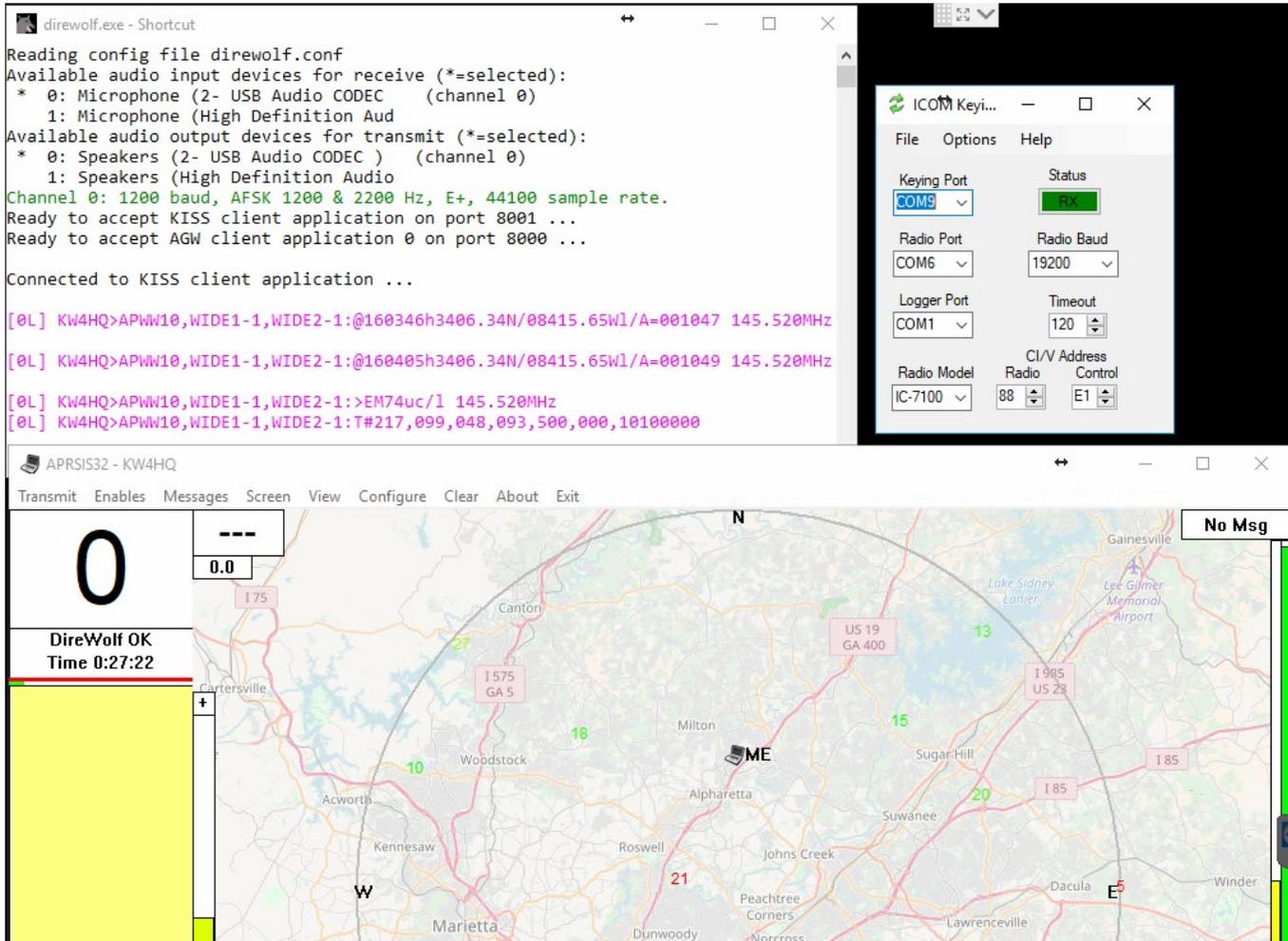
- 1 – The little text-based waterfall
- 2 – Digipeater call sign
- 3 – Audio level, this varies a lot.
- 4 – Suwanee Mountain digipeater beacon

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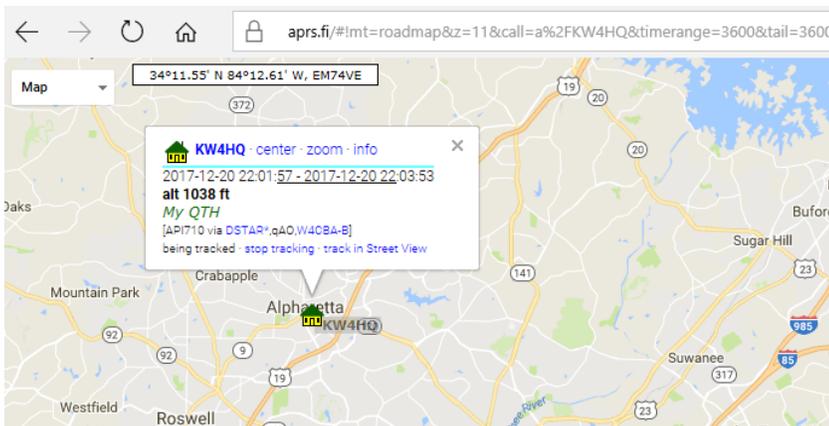
Sending data over the TNC

One of the things you can now do is use your TNC to send packets out over the RF network. Using the apps that make this possible you can now use your software TNC. The image below shows the ICOM Keyer (The app created for the reason for this article), APRSI32, and Direwolf.



Viewing yourself on APRS.fi

Now that you have a TNC up and running, take a look at your station on www.aprs.fi.



NFARL has a special application for ICOM transceivers that can trigger the rig to Transmit using a software based TNC so you do not have to use a Signal Link or external devices. ICom can only TX using IC-V commands, but a software keyer is available to automatically take care of this. Just ask us, we'll be glad to help.

73's de KW4HQ

Cherokee Christian Schools VE Session / Chris Caldwell, W4CCH

Four students from Cherokee Christian Schools (CCS) in Woodstock punched their Tech tickets on December 14th. Gabriel, Jonathan, Jeremiah, and Cooper are anxiously waiting for their newly minted call signs to show up in the FCC database. Kudos to these guys for their interest and intense study efforts.

CCS has over 400 students from kindergarten through high school. We have graduated several classes from our high school STEM diploma track. Our program is actively expanding in two directions: 1) an emphasis on engineering design and its requisite communication skills and 2) a broadly accessible STEM program in our middle and elementary schools. Ham radio is a great tool for these efforts. The guys that punched their tickets were 7th and 8th graders in our Adventures in Radio elective.

The elective met three days a week for a semester. After getting a general intro to radio under our collective belts, we set up an ADSB mapping system using an SDR receiver from AirSpy.com to track beacons from private airplanes and commercial airliners. With a modest antenna, we could see from 30 to 50 aircraft transponder beacons simultaneously. Beyond tracking airplanes, the AirSpy equipment is useful for demonstrating concepts like waterfalls, frequency bands, and different modes of operation.

As the novelty of tracking airplanes wore off, the soldering projects started, introducing a practical side of electronic components. After a starter project, each student soldered up either an FM or an AM radio. Besides the challenge of a more complex build, it introduced amplitude and frequency modulation and started them on their tech ticket study path.

With budding building skills in hand, the students' next project was 2M Tape Measure Yagis to use for foxhunting. Some students cut the PVC and the steel tape measures, while others soldered together the KC9ON attenuators. We "contracted" out a custom designed 3D-printed box for the attenuator to Neale, our 11th grade STEM lab manager. The end result looked nice and was quite usable.

Hunting the fox (a Byonics Micro-Fox 15) proved to be the hit of the semester. 7th grade faced off against 8th grade many times as their fox hunting skills improved. The only hunt that proved too illusive was when we hid the fox in a panel in the wall of the gym. Even so, they were within feet of the transmitter. For the record, the 7th grade team proved the better of the fox hunters.

All along, they studied for their licenses. KB6NU's tech license guide introduced them to ham radio concepts and built a base of knowledge. Hamstudy.org let the students assess their knowledge with online practice tests, tracking and emphasizing the questions they didn't yet know.

With our first tickets punched, we plan to integrate ham radio as one avenue to explore STEM and Engineering Design across different grade levels at CCS. Our obvious next step is to get a school club call sign. Beyond that, we're exploring a variety of ham related activities: Hosting "Open Shack" times for Get-On-The-Air opportunities, building a school WSPR beacon, an APRS weather station, a Morse code club, and HamSci.org projects for our older students.

Many thanks to Chuck (AE4CW) and Martha (W4MSA) for their advice and being sounding boards. Thanks as well to the NFARL VE team that came onsite to administer the Tech exam: Chuck (AE4CW), Neil (N4FN), Jim (W4QO), and Martha (W4MSA).

73 and looking forward to seeing our club call sign on the air,

Chris, W4CCH

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147.060 (+) Primary ARES Repeater	100 Hz	Roswell Water Tower
224.620 (-) Joint Venture with MATPARC	100 Hz	Sweat Mountain
443.150 (+)	No Tone	Roswell Water Tower
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