



PARTicles

The newsletter of PART of Westford, MA – WB1GOF

February 2011

President's Column

Due to inclement weather, it was necessary to cancel our January club meeting. I think this was the 2nd year in a row where we had foul weather on our January meeting date. Fortunately, our speaker, Frant Etzler (N8WXQ), is planning to speak at the February club meeting. His talk will be about HF propagation and related computer software.



Yearly membership dues can be paid at the February meeting. Please be sure to fill out a membership form and bring it to the meeting with your payment, even for membership renewal. For family memberships, please note somewhere on the form the name and callsign of the other family member(s).

I am happy to mention that we had our usual good turnout at the 1st Saturday breakfast on

February 5th. There were 24 people enjoying the food and good company.

It isn't too early to start thinking about Field Day, which will be on the last weekend of June. I am looking for a Field Day chairman and a couple of assistants. If you are interested in this role, please contact me. Please note that there are a great many things to do to make Field Day a success, and thus there are both large and small ways for everybody to participate.

Please take a look at the new "Awards and Achievements" article in PARTicles. If you have any awards or achievements that you'd like to see in our newsletter, please send them to me via email. If you have other ideas for PARTicles, or if you feel like writing your own article, please send your submission to Terry (KA8SCP).

73 de Andy KB1OIQ

Next Club Meeting – February 15th!

**Meeting will be held at the police station.
7:30 PM start time, come earlier to socialize.**

Frank Etzler (N8WXQ) is speaking. Rescheduled from last month.

**Yearly dues are due!
Full \$25/Senior \$15/Family \$30/Student \$15/Associate \$10**

Upcoming PART Meetings/Events

Feb. 15, 2011

- February club meeting night. Guest speaker is Frank Etzler (N8WXQ), Club dues are due

Mar. 5, 2011

- PART Monthly breakfast 8:00 AM – Westford Regency

Mar. 15, 2011

- Mar. club meeting night. Club dues were due in January

Treasurer's Report

PART Treasury 04-Jan-10 thru 06-Feb-11

	General Fund	Repeater Fund	Checking Total	
Old Balance	2856.38	744.71		3601.09
Income	320.00	23.00		343.00
Expenses	39.16	0.00		39.16
New Balance	3137.22	767.71		3904.93

PART Membership Demographics as of 6-Feb-11

	Households (New + Renew)	Individuals (New + Renew)
Full (\$25)	11 (4 + 7)	11 (4 + 7)
Senior (\$15)	9 (1 + 8)	9 (1 + 8)
Family (\$30)	1 (0 + 1)	2 (0 + 2)
Student (\$15)	0 (0 + 1)	0 (0 + 0)
Associate (\$10)	0 (0 + 0)	0 (0 + 0)
Grand Total	21 (5 + 16)	22 (5 + 17)

***** Dues are due *****

PART, P.O. Box 503, Westford, MA 01886-0015

-or-

Meeting, Westford P.D., 7:30PM, Tuesday, 15-Feb'11

Upcoming Events

- Feb. 19, 2011 Marlboro Flea (<http://www.qsl.net/n1em/2011flier.pdf>)
- Feb. 20, 2011 GBARC RadioXLII @ Westford Regency (http://www.antiqeradio.com/Radio_XLII_Full_Page_ad.pdf)
- Apr.3, 2011 FARA/Framingham Flea (<http://www.fara.org/flea/>)
- Apr. 29 & 30, 2011 NEAR-Fest Deerfield Fairgrounds, NH (<http://www.near-fest.com>)
- Dayton Hamvention, Dayton, OH May 20-22 (<http://www.hamvention.org/>)
- Field Day June 25/26 (<http://www.arrl.org/field-day>)
- Every Wednesday, 6 AM, Owl Diner Lowell – Breakfast
- Every 1st Saturday, 8 AM, Regency Inn Westford – PART Monthly Breakfast

Monthly PART Breakfast

Don't forget the monthly PART breakfast the 1st Saturday of each month at the Westford Regency Inn at 8 AM. The full hot & cold buffet breakfast costs about \$14 (includes tip) per person, a cheaper, lighter fare is available for adults and children. **NOTE: PLEASE let the folks who are settling the bill with the hotel whether you had a full or continental breakfast!**

Confused about Digital Radio

By Dan Woodie – KC8ZUM

I cannot believe how misinformed the other users who have posted on this topic are. I am not going to take sides but rather clear some things up regarding this topic.

Background: I am a user of P25, D-Star, APRS, Packet (Yes, it still lives), and Analog Voice (Including HF, VHF, 220, UHF, and 900). I use each of these modes very frequently with no bias towards any one. I enjoy the diversity of using several bands, modes, and technologies.

Proprietary codecs/standards/etc:

IMBE, Improved Multi-Band Excitation is the codec used in P25.

AMBE, Advanced Multi-Band Excitation is the codec used in D-Star, Kenwood NEXEDGE, Icom IDAS, and Harris OpenSky among others.

Both of these codecs are owned and patented by DVSI, Digital Voice Systems, Incorporated.

IMBE is an earlier standard; AMBE was an improvement on IMBE as were AMBE+ and AMBE+2 which were both developed subsequent to the P25 and D-Star Standards being written.

Both codecs are available both as software with a license agreement and AMBE is also available embedded in a self-contained DSP chip which DOES NOT require additional licensing. The most commonly used chips are the AMBE-2000 and AMBE-2020. At last check the AMBE-2020 sells in quantities of one for ~\$20-25 and DOES NOT require additional licensing.

The D-Star System, with the exception of the Voice Codec as detailed above is an OPEN STANDARD published by the JARL, the Japanese Amateur Radio League and was developed in cooperation with a number of radio manufacturers. D-Star was developed exclusively for Amateur Radio and includes features specific to the hobby. The D-Star standard is not patented as a whole by Icom or any other party; however Icom does own the D-Star name as a Trademark representing the Digital Amateur Radio system developed by the JARL. Non-Icom D-Star Compatible equipment is commonly referred to as DV Capable.

P25 is also an open standard with the exception of the Voice Codec; however P25 was developed for Public Safety users so the features are tailored to a Public Safety Dispatch environment.

NXDN, the standard used by both Kenwood's NEXEDGE and Icom's IDAS system is a standard developed jointly by Kenwood, Icom, and other radio manufacturers utilizing the AMBE+2 Codec.

FACTOR III is a Packet protocol patented by SCS and requires a license. It is commonly used for Winlink2000 and SailMail.

FM, Frequency Modulation was invented and patented by Edwin Howard Armstrong in the 1930s. It WAS Proprietary needed to be licensed prior to expiration of this patent.

SSB, Single Side Band was Invented and Patented by John Renshaw Carson in 1915. It WAS Proprietary needed to be licensed prior to expiration of this patent.

Almost every modulation scheme/technology/codec is or has been patented at one time or another and required licensing. There are very few truly "Open Source" codecs available.

My understanding is that the JARL evaluated all of the available codecs at the time the D-Star Standard was developed, both free and licensed, and chose the best fit for both functionality (Voice Quality+Spectral Efficiency) and economy. At the time, AMBE was the most robust and practical codec available at a low cost-per-unit.

When APCO selected IMBE as the standard for P25 it was the best available codec at the time. APCO is currently selecting the new standard for P25 Phase II which will not use IMBE and will likely be incompatible with P25 Phase I.

Cost of radios:

The most common complaint I hear about Digital Radio is that "It's too expensive". While it is true that digital radios tend to be more expensive than their analog counterparts, there are many reasons for this beyond the cost of the codec for this.

D-Star Radios - D-Star uses GMSK modulation at a 6.25 KHz channel spacing, or approximately 1.25 KHz deviation. This requires a radio that is VERY stable in all aspects especially when it comes to frequency. Most analog amateur radios offer a frequency stability of +/-5 PPM or worse. I have seen brand new analog radios that will drift over 1 KHz during the first 30 seconds of transmitting. D-Star radios utilize +/-2.5 PPM or better reference oscillators and will very rarely drift more than 100Hz during any length of operation. This also makes them operate better as ANALOG radios. Keep in mind that a D-Star radio is not dedicated to D-Star but is also a VERY nice ANALOG radio. Development expenses are also a factor as Icom has spent a lot of money designing new circuits and the support equipment/system for the D-Star system.

P25 Radios - Currently P25 radios are only available in the form of commercial/public safety radios from Motorola, Kenwood, Harris, EF Johnson (AKA Motorola #2), Icom, Vertex (AKA Motorola #3), Tait, Midland, Relm, etc. The least expensive NEW P25 radio is right around \$1000 and most are in the \$3000-5000 range. On the used market the range is \$500-3000. Until recently all P25 radios were single band. The new Multi-Band radios are in the \$7000-9000 range. These radios are designed for public safety and were built with durability and ease of use over features and cost since most are purchased by government agencies.

Non-Icom D-Star solutions for DV Voice are now available including the DV Dongle, DVAP Dongle, DV Node Adapter, DV Hotspot, DV Adapter, etc. These solutions either replace an Icom D-Star radio or add features/capabilities to a D-Star radio.

Capabilities of Digital Radio Systems:

P25, as applied to Amateur Radio is capable of operating in mixed-mode with analog, allowing a repeater to pass both analog and digital traffic. Unfortunately this can annoy existing analog users who do not know how to set tone squelch and accidental or intentional interference between modes often occurs on these systems. There is no linking scheme, internet or otherwise, available for P25 that is practical for Amateur Radio use. In short, a P25 system is just a conventional repeater where you have the choice to talk Analog or digital. P25 Voice range can exceed the useful range of FM in many situations but when you run out of range it tends to be more defined than on analog. P25 has many other features but most are either illegal or impractical for Amateur Radio use (IE: Trunking, Encryption, etc).

D-Star is a system designed exclusively for Amateur radio. D-Star utilizes a 4800 Baud Data Stream which is composed of 2400 Baud AMBE Voice, 1200 Baud AMBE Voice FEC (Forward Error Correction), and 1200 Baud Low-Speed Data. D-Star includes callsign identification and routing, allowing users to be identified on every transmission, making it legally unnecessary to identify by voice although most still do as a courtesy. Callsign routing allows you to call another operator without knowing their location or what system they are using by simply entering their callsign in the URCALL (Your Call) field of your radio. The trust server system identifies the last location where that callsign keyed their radio and the call is routed to that repeater/node.

D-Star radios, on average, have 20-30% greater usable range than analog radios thanks in part to the Forward Error Correction that "Fills in the blanks" when packets are lost in the primary data stream.

A non-Icom system known as D-Plus has been developed by Robin Cutshaw, AA4RC, and implemented on most D-Star Gateway systems around the globe. This system allows repeaters to be linked to each other or to Reflectors, allowing many repeaters/users to be linked together into a seamless network. Unlike Echolink and IRLP the integration of linking is seamless and unless you know the repeater is linked you would think you were talking to local station as the audio quality/levels are identical.

Other non-Icom solutions include:

DV-Dongle - allows access to D-Plus enabled gateways and reflectors with only a computer - no radio necessary. DVAP Dongle - Allows access to D-Plus enabled gateways and reflectors with the use of a d-star enabled radio on VHF in areas where a D-Star repeater system is not available.

DV Node Adapter - Can be used with DVAR Hotspot and other software to integrate a non-d-star 9600 Baud capable analog radio for many applications in d-star including as a Hotspot or repeater.

DVAR Hotspot - Software used with a DV Node Adapter to enable functions similar to the DVAP Dongle but with more power and the capability to function as a full-duplex D-Star Capable repeater.

DV Adapter - An adapter that connects to a 9600 Baud Capable Analog radio to enable D-Star Functionality.

D-Rats - A Data communications program allowing instant messaging, GPS tracking, file/picture transfer, etc.

D-Star TV - A program allowing Slow-Scan TV on D-Star Low-Speed Data and Fast-Scan Real-Time TV on D-Star DD Digital Data on 1.2GHz.

DPRS - The D-Star equivalent of APRS which operates simultaneous with voice and can interface with APRS.

There are many other D-Star applications that have been and are being developed.

"D-Star is going to fail", "D-Star is dead", etc.:

D-star already has a VERY strong foothold in the amateur market. Whether it is the best choice for amateur radio is a valid argument but it is too late - the standard is well-established and will continue in one form or another for the foreseeable future. Currently there are 559 D-Star Gateways which does not include systems that are not internet connected or those that have more than one repeater. Each gateway can have up to 3 voice repeaters and 1 data repeater. Currently there are over 13,000 D-Star users registered for gateway use with 30-40 new registrations per day. I don't think all of these repeaters and users are just going to decide to throw their equipment away and go back to Analog or P25.

In Conclusion:

Just because you do not like a new technology does not mean you should make a fool of yourself by bashing on it without knowing the facts. Please, make sure you inform yourself before making silly statements. Without the development of new technologies there would be no reason for the continued existence of Amateur Radio. This does not mean we should abandon older technologies, but rather we should all be gracious as we should be and accept the new technologies as they are developed, whether we choose to use them or not. If you think there is a problem with a new technology don't bash on it, work to learn about it and develop a solution.

I will have to say that the users on D-Star and P25 tend to be much more technically capable than the average analog user and the rate of development of D-Star solutions is evidence of this. It is more comparable to what Amateur Radio used to be before the age of Appliance Operators, dumbed down tests, and \$150 analog rigs.

To those who have not tried D-Star or P25, find someone who has it and try it - you might like it.

To those who have tried D-Star and P25 and don't like them - I doubt there are very many - but you are entitled to your opinions and nobody is going to force you to use new technology - use what you are comfortable with and enjoy.

By Dan Woodie – KC8ZUM

NOTE: Posted online at <http://forums.qrz.com/showthread.php?253075-D-STAR..The-Future/page9>

Member Contributions

Battery Lantern Challenge – Peter Barbella, KB1LZH

The Nashoba Valley Amateur Radio Club is running a fun event/contest. It is called the lantern battery challenge. This is an annual event and I am participating for the first time. It is fun, and quite a challenge.

The rules are simple. Everyone is issued one of a set of identical "lantern battery" configurations, set up for 14 volts output. (see photo). The object of the challenge is to make as many QSOs as you can, using only your battery. There are several categories. I am in the "transmit only" category. I use my ICOM receiver, but I transmit with only battery power.

I built a homebrew rig for this event. I started with a simple Colpitts oscillator that tuned the entire 160 meter band. I found a power MOSFET in my junk box and tried to make a QRP class E transmitter for high efficiency. I failed miserably, but I got a signal in the air. The efficiency was about 10%. But, using only CW, I keyed the power supply to help the cause.

Unfortunately, 160 meters was as dead as a doornail (when I began the contest). I wasn't getting any QSOs.

So I modified my oscillator to 80 meters. Now, the efficiency went down to about 3% and I was only getting out about 100 milliwatts, but, I started making QSOs. I got as far as western New York.

I had to make some adjustments to my operating procedure.

First, I try very hard to not call CQ. The number of people who can hear me is limited and the key closes a lot of times in a typical CQ call.

That meant I had to do a lot of listening (not a bad thing). When I heard someone calling CQ, I had to use QRZ.com to see how far away he was. Then I had to tune my Colpitts to his frequency. The tuning capacitor could provide only course tuning, but I discovered that I could fine tune the rig by moving my hand closer to or further away from the preamp section.

Well, the rig is still working and I have until the end of February to make QSOs. My latest was Waterford, ME. The power is now down to 65 mw, but I continue to search for local stations. Early morning is best, when the band is relatively quiet. So far I have 36 QSOs, well on my way to my goal of 50.

It is unlikely that I am going to win this contest, but I have learned a lot of things about getting power onto an antenna. And the most important thing I have learned is that I have a lot more to learn. On top of that, all the listening has made a marked improvement to my CW skills.

So if you tune around 3.550 and put out a CQ, listen for a faint chirping signal. It could help me get to 50.



ARRL News

- [Radio Club d'Haiti Receives Repeater from ARRL and Radio Club Dominicano](#)
- [The ARRL International DX CW Contest Is Just One Week Away!](#)
- [FCC Adds New Country to CEPT Reciprocal Agreement for Amateurs](#)
- [Mixed Decision from the California Court of Appeals in Palmdale, California Antenna Case](#)
- [New QuickStats Poll Now Available on ARRL Website](#)

Radio Awards and Accomplishments

By Andy Stewart – KB1OIQ

- Rich (AB1HD) recently joined the Straight Key Century Club (SKCC) and made his first CW QSO on 40m with an SKCC member. The exchange consisted of a signal report, name, 2-letter state, and the SKCC club number. For club info, please check <http://www.skccgroup.com>.
- Andy (KB1OIQ) has earned the Tribune award from the SKCC for completing 50 new CW QSOs with other club members who have previously earned the Centurion or Tribune award.
- Charlie (K1PUB) and Andy (KB1OIQ) spent time as CW operators of the K3Y/1 special event station commemorating the 5th anniversary of the SKCC. This event ran for the entire month of January 2011. Charlie logged the most QSOs of any station operating as K3Y/1 with 429 QSOs. Andy logged 54 QSOs operating as K3Y/1, the 7th highest total (out of 14) for all K3Y/1 operators.
- Geoffrey (KB1USE) had his very first DX CW QSO with Bernard (F5DE) in France. Both are members of the SKCC. Geoffrey sent and subsequently received a FB QSL card.
- Andy (KB1OIQ) earned the Worked All States Award from eQSL. He is one state away from getting the same award from the ARRL.
- Scott (as KP2/NE1RD) had the highest single band QRP score in the CQ WW WPX SSB contest held in March 2010. The 639,086 points was good enough to be #1 in the world for the 15m QRP category of the contest, set a new North American record, and to slide into third place all time. The single band score was also good enough to edge out all other QRP and low power entries to win the 15m single band Tribander/Wires overlay category. Scott will be back on St. Thomas for this year's contest in March on 10m QRP (sunspots permitting!). Contest information and records database can be found at www.cqwp.com.
- Kim (K1ZA) was the first person to activate Stratton Mountain as part of the Summits on the Air amateur radio award program. He snowshoed his way to the summit with his ICOM 703+ and made 4 QSOs on 40m phone. Read more about his adventure at <http://sotawatch.org/article.php?summit=W1/GM-007&id=4373>.

Congratulations to everybody on their accomplishments!

Repeater Nets

146.955 Nets – There are a number of nets that are regularly scheduled on the 955 repeater.

- Sunday night at 2000/8:00 PM [Sunday Night PART Net](#) – every
- [Sector 1C RACES Net](#) – this net occurs the 1st Monday or every month (except when it is a holiday). [Skywarn](#) and [ARES Nets](#) – these nets are spontaneous when local conditions warranted.

442.450 D-Star Nets – There are a number of nets that are regularly scheduled.

- Sunday 8:00 PM [Ozark Mtn D-STAR Net](#) – Reflector 001C
- Tuesday 8:00 PM [New England Amateur D-STAR Net](#) – Reflector 010C

Repeater Information

Repeater Interference

The 146.955 repeater continues to see interference to existing conversations as well as at random quiet times throughout the day and night. The repeater interference committee needs your help in collecting data. If you hear any type of interference, please report the following info to "**repeater**" at "**wb1gof.org**":

- Time: When did the event happen?
- Observing location: Where were you? Were you mobile?
- Frequency: Input only (146.355 MHz)
- What you heard: Voices, tones, kerchunking or whatever.
- Signal strength: Either by ear (noisy, quiet or full quiet) or S meter
- Radio: To get an idea of the reporter's radio situation.

* Most important - what direction: How did you determine direction? This is the most essential piece of information. Even if it's an estimate as in "Roughly east" or "from the Northeast" it's useful. NEVER EVER reply or direct any thing to the sick person causing the interference. Because some of us have answered this person, he knows we are aware of him and that is what keeps him doing it. Also since you are communicating with a non IDing station you are operating just as illegally as he is. YOU ARE BROADCASTING! NEVER TALK ABOUT INTERFERENCE on air. NEVER

If you are interested in assisting in helping us identify the sources of interference, contact Terry-KA8SCP.

EmComm events and repeater use

Most everyone knows that the 146.955 repeater is used during times of emergency situations, drills and exercises. Skywarn and the monthly RACES drills are the normal events.

So what does this mean to those that are just looking for regular QSOs with other users? It means that if you are in a regular QSO and there is a significant weather situation that has been getting press/air-time lately, you can expect that if severe weather develops in our area, the folks from Taunton-WX1BOX may interrupt a QSO and ask anyone on frequency what may be happening weather wise. The BOX operator will probably ask for specific information, hail, wind damage, property damage from lightning or wind, etc. Please give him the information he needs or tell him that you've not heard of any such activity. You don't need to tell him it is sunny in Nashua!

There may come a time when an unexpected emergency situation arises. These will significant events that may affect life and property. This is where ARES/RACES activity may step in. Usually an NCS will interrupt a QSO and announce the situation and ask for a QSO to cease or to be "aware" of the possibility of priority calls/traffic. Please make sure you leave breaks between transmissions so stations with traffic can get in between QSOs. If there is enough traffic, it may be necessary for your existing/interrupted QSO QSY to another frequency. You should use your best judgment or check with the NCS on what he feels is best.

If you have any questions, please feel free to correspond with either Hugh-N1QGE (Westford RACES Officer and Skywarn NCS) or Terry-KA8SCP (regional RACES Officer and Skywarn NCS) . They will be more than happy to talk about these programs with you.

PART Gear

The PART Quartermaster has lots of great PART-ware for sale including hats, mugs, and shirts. You can get information how you can obtain your PART-ware at the monthly club meetings.

Club members are also encouraged to obtain an official PART badge from [The Sign Man](http://thesignman.com/clubs/part.html) (<http://thesignman.com/clubs/part.html>) PLEASE NOTE: There is a new PART badge available if you'd like to order one. Price for badge is \$15 which includes shipping and handling.



EmComm

RACES – The WB1GOF 146.955 repeater is used on the first Monday of every month (except federal/state holidays) for RACES starting at 1930 local time. If you are interested in being part of the local emergency communications team in your community, feel free to contact any of the following folks:

Terry Stader – KA8SCP, MEMA Region 1 RACES Officer
Hugh Maguire – N1QGE, RACES Officer, Town of Westford
Bill Ohm – W1OHM, RACES Officer, Town of Chelmsford
- We need radio operators that can pass messages on to the local emergency management directors in several towns in northern Middlesex County.

Skywarn - The WB1GOF 146.955 repeater is also used for reporting significant weather events to the National Weather Service from our local spotters. We expect to have a local Skywarn training class in 2010, more information as it becomes available. You can provide valuable information even if you have not attended one of the training sessions. Listen to the Skywarn Net Control Station for reporting criteria, when you have information that qualifies, please advise him with your report.

Situational Awareness – Recently, the Massachusetts Emergency Management Agency has asked the Amateur Radio community to provide situational awareness and disaster intelligence information within your local community via RACES, ARES and/or Skywarn stations. Significant events such as widespread power outages can be reported and by agencies such as MEMA to evaluate the scope of a blackout for example. Initially, you should try and contact RACES or ARES operators on the Westford 146.955 repeater to pass this information. More on this new program will be forthcoming.

PART Sunday Night Net – The PART Net each Sunday night is an IMPORTANT part of our regional EmComm function. With each station that checks in from the surrounding communities, we test our ability to communicate vital information to the ham radio community. Sure we announce club info but we can also communicate regional disaster news and serve as a “hub” for news of situations in our communities. The repeater is on a generator, so even if we loose power in the region, an HT with a supply of batteries will reconnect you to other local hams.



PARTicles © 2010, a publication of PART of Westford, MA – WB1GOF

This month's editor: Terry Stader – KA8SCP

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