NVARC
Nashoba Valley
Amateur Radio Club

SIGNAL

SPECIAL SERVICE CLUB

de N1NC

February 2015 Volume 24 Number 2

This Month's Program

Jack Warren, WB4MDC, joins us for an informative and entertaining presentation called "Hamshack Hints and Kinks." Jack's an animated speaker. Prepare for a little "gee whiz," a bit of humor, and maybe a bit of inspiration.

We're working on a secondary program, too. Wolf, KA1VOU, had agreed to share his experiences building the keyer project during last Fall's Tech Nights. He was originally scheduled to speak in March but we're going to see if he can talk in February. That brings up:

Next Month's Program

Doug Grant, K1DG, returns to NVARC for our March meeting. Our club was quite busy over the last three years supporting WRTC-2014 (the World Radiosport Team Championships). Well, WRTC has come and gone as a very successful event. Doug has the professionally-prepared video wrap-up of the event. No guarantees, but look for NVARC members to show prominently in the production. That's a fairly easy prediction: we were active and one of the videographers was Pepperell's very own Dave Pease, a good friend of the club.

President's Corner

de Skip K1NKR

Keeping up. We all got into this hobby because we were intrigued with radio technology—either what it was or what it could do. Radio technology has benefited from a century-long progression of technology. Sometimes the new stuff can be overwhelming.

One of the things I do is to keep up with professional publications I subscribed to during my engineering career. In addition to QST (the premier, of course), I still read IEEE Spectrum, the IEEE Journal of Ocean Engineering, Sea Technology, Inside GNSS (Global Navigation Satellite Systems), and Navigation-the journal of the Institute of Navigation.

An article in the most recent issue of Navigation described the success researchers at the University of Texas at Austin had achieved in applying digital signal processing (DSP) techniques to do detailed analysis of live-sky GPS signals. Before their work, looking at the internals of signals that emanated from approximately 10-watt transmitters on satellites orbiting at an altitude of 20,200 km (that's 12,600 mi for those of you not keeping up with technology) required the use of high-gain dish antennas. Using DSP the researchers were able to capture detailed signal data using a standard low-gain omnidirectional GPS antenna. DSP? That's the same technology—even though it's different math in this case—as KenYaeCom use in ham gear.

A lot of the DSP technology push has been from the cellular telephone industry. And Jeff, WA1HCO, noted in a recent talk for the Nashua Amateur Radio Club that DSP chips are now more powerful and less expensive than general-purpose CPUs. Based on cost and capability, Jeff predicts that in a decade all new radios will be almost entirely DSP-based, be smaller and yet more powerful, and possibly be less costly than current rigs. The driving factors, he says, will be the size of the physical interface (knobs), the cost of the enclosure, and the size and cost of the filter components. By the way, KenYaeCom are already about two generations behind commerce and the military in this technology. They aren't keeping up!

So, are we destined to choose between being computer geeks or being dinosaurs? I think not. We and our predecessors have progressed out of spark into to tubes, transistors, and integrated circuits—and now into signal processors. We keep up because we're interested.

Think of it: each of those new technologies effected pretty much a functional replacement for the earlier one. Galena crystal detectors were replaced by diodes and triodes. And the amplification func-

tion was added as well. Multi-element tubes replaced single element ones. Take the pentagrid converter tube, which would oscillate and also provide signal amplification as well as the radio's frequency shifting function. Not too long after transistors morphed into integrated circuits entire broadcast band receivers could be built around a single IC. So what DSP! Here's no magic. DSP is just one or more radio functions built out of equations residing on an IC.

We Amateurs are not just designers of the internals of radios. Some of us don't do that at all. But virtually all of us are "systems integrators." We build or make rigs, accessories, and other stuff into radio shacks that functionally behave the way *we* want them to. Beyond embedded DSP chips we have desktop computers, Arduinos, and Raspberry Pi's. Maybe there's a little programming involved, but if we keep our sights on the functional requirements we define for our own station's capabilities we won't end up being those dratted computer geeks. Well, as long as we keep up and remain the drivers of our stations' functional requirements.

We're a hardy lot. (Did I hear a "Hardie, har, har, har?) Always inquisitive. Always creative. Both defining and pushing the boundaries—but each of us working at his or her own pace. Just keeping up for the sheer enjoyment of it. It is a hobby, after all.

Last Month's Meeting

The meeting was called to order by Jim N8VIM VP. His pre-meeting slide show was aerial pictures of last year's Field Day.

Photo Courtesy KD1LE

January's program was Members' Short Subject Night. Much like December's Small Projects Night, this meeting is the second of two in the year where members call the shots and make the presentations.

Photo Courtesy KD1LE

Bob W1XP spoke about the Lantern Battery Challenge and polled the participants to see how many had made contacts. He encouraged everyone to get on the air and use up those batteries.

Bob also talked about club participation and log submission in the January VHF contest. Bob had written an article about it in the January Signal.

Bob also spoke about his attempt at HF mobile on a recent cross country train trip he and Karen KA1JVU recently made.

Photo Courtesy KD1LE

Rod WA1TAC listed some possible club projects based on Raspberry Pi and Arduino and solicited members comments and additional suggestions.

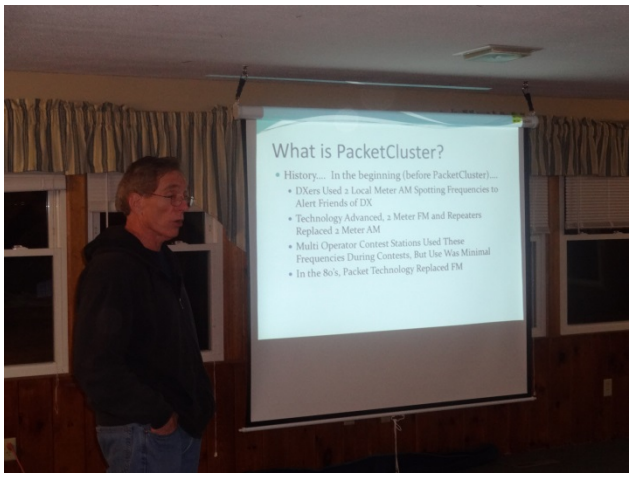

Photo Courtesy KD1LE

Bruce K1BG presented several short related presentations including Packetcluster with the history and development, the Skimmer system, and the Reverse Beacon Network.

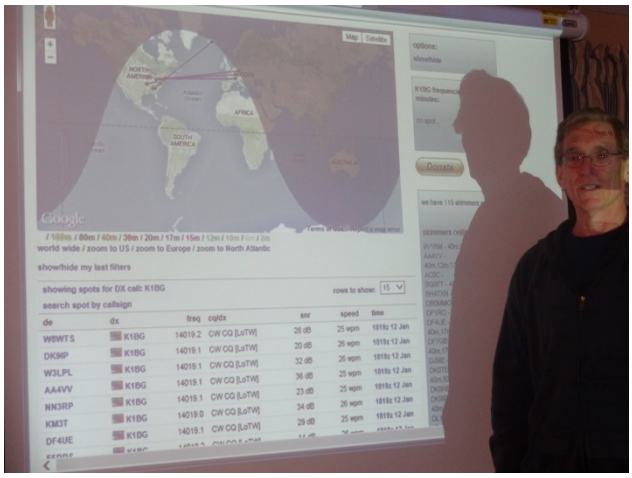

Photo Courtesy KD1LE

Present at the January meeting were;

KD1LE STAN, N8VIM JIM, W1XP BOB, WA1TAC ROD, K1YTS GARY, KB1JKL PHIL, KB1UVP KEN, W1LTN DICK, KW2T DAN, EX-K4OHZ BILL, KB1WAQ GREG, K1LK LEO, K1LGQ DENNIS, K1NS BILL, N1SV LES, K1BG BRUCE, WA1RCH CHUCK (BROUGHT A CAKE TO SHARE), KK1X JOHN, N1ZRG PETER, AB1WQ JIM

Winner of the book raffle was Phil KB1JKL

January Tech Night

Attendees: Dan KW2T, Bill K1NS, Rod WA1TAC, Chuck WA1RCH (a newcomer, thanks to Bruce's wide e-mail distribution) (AND he brought great chocolate chip cookies his wife made, tons of them, I ate 5 of them), Peter N1ZRG, Jim AB1WQ, John K1JEB, Bob W1XP, George W1JHR, Bruce K1BG, and Dennis K1LGQ.

Tech Night was held January 8th, as usual the 2nd Thursday of the month. Even though the basement was signed out for us, a crowd of cub scouts had taken it over, so we went upstairs, which was signed out but they were a no-show fortunately.

Lots of technical things were done! George W1JHR brought in 2 filters to test, one turned out to be a notch filter around 1 GHz, the other was a good performing 3-pole interdigital filter for 1296 (0.4 dB Insertion Loss, 10 MHz 3dB BW). Next, Bill K1NS brought in a pocket scope that looked like a cell phone, but it was a 4 channel oscilloscope! Feeding the RF signal generator into it, it looked like the sample rate was very low, like 3 MHz, but then we didn't know how to run it or even set the sweep speed. It had 4 color channels, seemed to work great, 4 coaxial inputs even.

Photo Courtesy Dan KW2T

Next we put the Baofeng/Pofung radios to the test, and found they had very bad 2nd harmonic output, only 40 dB down on high power on 2 meters, 45 dB down on UHF high power. FCC rules 97.307e say that emissions on 30-225MHz must be 60 dB down, but if <25W, then 40db down AND less than 25 uW (-16 dBm) but need not be less than 10 uW (-20 dBm). These radios do not meet these

requirements on 2 meters, where the 2nd harmonic was only -40 dB below 4W (-4 dBm), and -45dB below 1W. Unless I'm reading the rules wrong. And I don't see any harmonic requirements above 225 MHz. Maybe someone can enlighten me. Get what you pay for I guess.

John K1JEB also brought in a laptop with the CHIRP programming software for these radios, and we got his new Pofung radio set up for some local repeaters. The software is confusing on how it refers to the tone settings on the radio. There is a tone mode selection that calls the simple transmit sub-audible tone mode "tone", but there are still columns for inputting info on digital squelch and even receiver tone squelch (implying that the repeater is transmitting a sub-audible tone, which I think is rare).

John JEB brought in an antenna impedance bridge he built, hoping to test its frequency range. Worked well through 2 meters, had good match to the radio up to 900 MHz, though the balance started to fail above 2 meters.

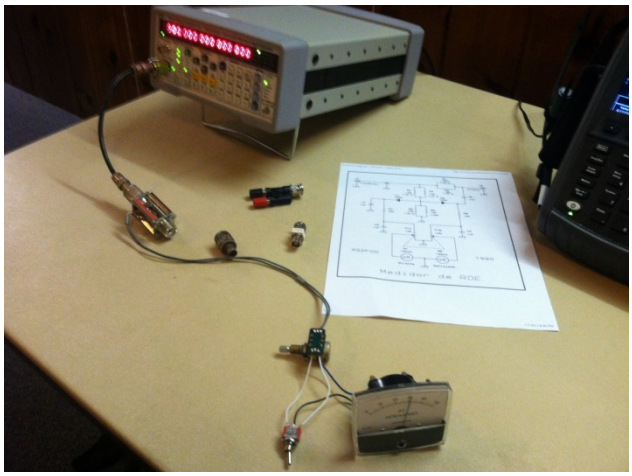

Photo Courtesy Dan KW2T

Lastly, I talked about the Chinese antenna tuner, and asked if it should be a club project. Most seemed to think it should be since it was so cheap anyway ($14 INCLUDES shipping). I had measured it's impedance range, but hadn't finished building it, and neither had Dennis who bought it first. So no input on real performance yet. I hope to have all that by next tech night.

Oh, and then there was a brief discussion at the very end about the H-mode mixer. I hadn't heard about this, but it was patented some time ago, seemed like the ideal receiver front end.

So a pretty good Tech Night. Lot's of good technical meat to it.

Next Tech Night is Feb 12th, same time and place. Hope to see you there.

-Dan, KW2T

NVARC QSL Bureau

One benefit of membership in NVARC is the free forwarding of QSL cards to the ARRL's outbound DX QSL bureau. In the past Bob, W1XP, has collected and sent cards. At the last NVARC Board of Director's meeting it was decided that Rod, WA1TAC, will assume this task for the future. Rod will be accepting cards at the November meeting. As before, all cards for the outbound bureau should have the recipient's call on the upper right corner, be sorted alphabetically, and include proof of current ARRL membership.

73, Rod

February Board Meeting Notes

Meeting started at 7:35
Skip, Jim, John, Bob, Ralph

Discussion of membership renewals. We continue to average about 30 members in arrears.
Summer study will be archived. It failed to move forward in the club meeting.
Papers for Pepperell welcome packet submitted to Pepperell Town Clerk
Suggestion that the new Groton Fire Station be used for Field Day
Club rig was loaned to Jim AB1WQ who has put it on the air, using the club power supply and an antenna assisted by Bruce K1BG.
John to order some Arduino boards for raffle.
No progress on the annual report.
No progress on delinquent member weeding.
No progress on insurance
Library and Equipment lists on web page - John to update and relay to Ralph.
Girl Scout event support is in place
Advertising rates for business-card size ad $3/month & $15/year, other sizes for more money.
Looking for nominees for President as Skip is not going to run again.
Open meeting slots: Jack WB4MDC - hamshack hints & kinks, Peter's 3D printer guy (May or June),

KJ1H hams at performance rallies. April - elections and LBC awards.

John Griswold, KK1X

New England Division Cabinet Meeting January 10, 2015

I. Introductions
   A. Around the room
II. Centennial Year
   A. Lots of on the air activity – can we continue some of this into 2015?
      1. 100th of QST
      2. More long duration operating events?
      3. Maybe worked all EOC?
      4. Some short (12 hr.) events?
   B. Great talk at the convention by Chris Fugate, FEMA director
   C. Lots of new licenses and upgrades during 2014
      1. 33200 new hams – up in every division
      2. 165 K + members nationwide, up 2.3% in New England
   3. WRTC2014 was a huge success – about 500 volunteers involved
III. Topics
   A. Boxboro coming up in 2015
      1. Not the usual year
      2. Leaning toward annual
      3. See the website, www.boxboro.org, for details
   B. Digital activity up
      1. DMR on the rise, but not a lot published yet by the League
      2. New England DMR network is filling out
      3. Issues with interference between digital modes have generated a lot of controversy and comment. Band plan update is in the works
   C. Repeater coordination
      1. Repeater directory seems to diverge from coordinators' lists
      2. Some angst over changes in use of simplex channels by NESMC
   D. Emergency preparedness
      1. Growing threats to the power grid?
      2. Encourage preparation for "if all else fails" scenarios
      3. Practice before the events is key
      4. Material is being updated at HQ
      5. Get PSA's from HQ and get them to commercial radio stations
      6. Relationship building with served agencies
   E. FCC
      1. Canadian radar at 1915 KHz identified
      2. Little enforcement action lately
      3. Very little help with power line noise
      4. No action on 472-479 KHz or on 135 KHz yet
      5. Part 15 – scope seems to be expanding
      6. Compliance testing now mostly 3rd party
      7. Migratory birds action is still open
      8. RF exposure rule upgrades still in play
      9. PAVE PAWS radar upgrade coming
      10. "Model City" concept – may bypass some spectrum controls
      11. WRC-2015 – not a lot of ham radio related stuff – we'll see
      12. Grow lights are causing a lot of interferences
      13. Problems being noted with signal purity of cheap import VHF/UHF radios
   F. Getting more hams
      1. What is a ham ?
      2. Scouting ?
      3. FD publicity ?
      4. Social media is underused by the League
      5. Where are the people we would like to get interested?
      6. Maker movement is a particularly good place to look
      7. Is the League approach to projects too high-end?
IV. Monies collected

A. Auction, for Education fund - $164.80

New Hams

ARRL New England Division license statistics

The figures below show the number of newly licensed hams by month for each New England ARRL Section. The figures come from a scan of the FCC database.

New licensees in New England

2014->	Jul	Aug	Sep	Oct	Nov	Dec
CT	23	11	8	21	28	19
EMA	36	31	18	25	32	26
ME	15	3	9	10	12	3
NH	12	7	8	13	21	15
RI	2	2	3	4	4	8
VT	7	1	4		7	5
WMA	8	4	7	12	7	32
Novice						
Tech	89	57	48	71	97	92
Gen	12	10	4	12	14	12
Adv						
Extra	2	1	5	2		4
Total	103	68	57	85	111	108

License upgrades in New England

2014->	Jul	Aug	Sep	Oct	Nov	Dec
CT	17	9	4	3	14	4
EMA	18	6	7	16	9	12
ME	4	3	5	4	5	2
NH	2	4	5	5	1	5
RI	2		4			
VT	2	1	4	1		1
WMA	4		4	3	2	4
to Tech			1	1		
to Gen	34	11	19	21	25	20
to Extra	16	13	11	10	6	8
Total	50	24	31	32	31	28

January Treasurers Report

Income for January was $15 from membership renewals, $35 from the book raffle at the December meeting, and $2.04 in bank savings interest. Expenses were $39.20 for newsletter postage (2 months) and $92 for the annual Post Office box rental leaving a net expense for the month of $79.16.

Current balances:

General fund	$2,905.42
Community fund	$4,636.41

As of 5 February we have 35 members who are current with their dues and 29 renewals outstanding. Thank you to those of you who hand in your dues before Ralph comes to you. Please check your renewal status on the roster circulated at the monthly meeting or ask Ralph.

If you are joining ARRL or renewing your membership please consider letting Ralph send in the paperwork for you. The Club will buy the stamp and will get a commission from ARRL. ARRL membership checks should be made payable to NVARC; Ralph deducts the Club commission before forwarding your paperwork to Newington. As an Special Service Club, the ARRL expects a majority of Club members to also be ARRL members.

Ralph KD1SM

Meeting Coffee “Bar”

Many thanks to Ed Snapp, N1YFK, for his rejuvenating the coffee "bar" at the meetings. There's been an incremental increase in socializing, and that's what we meet for.

Don’t forget to leave a donation if you partake.

Items That Anywhere Else Would Be Called Strays

ONE

Even though he’s recently discovered HF after all these years, Dan KW2T still manages some VHF activity. He just received his certificate from last year’s ARRL January VHF Contest. Dan took first place for the Eastern Massachusetts Section AND the New England Division. He entered in the “Single Operator, 3-Band” category and had a score of 910 points. By the way, during that contest NVARC was 5th in Local Club category with 8 logs submitted and an aggregate score of 12074.

TWO

Historically, this is a significant time of the year. *(all from Wikipedia)*

Heinrich Rudolf Hertz (22 February 1857 – 1 January 1894) was a German physicist who first conclusively proved the existence of electromagnetic waves theorized by James Clerk Maxwell's electromagnetic theory of light. Hertz proved the theory by engineering instruments to transmit and receive radio pulses using experimental procedures that ruled out all other known wireless phenomena. The scientific unit of frequency – cycle per second – was named the "hertz" in his honor.

André-Marie Ampère (20 January 1775 – 10 June 1836)was a French physicist and mathematician who was one of the founders of the science of classical electromagnetism, which he referred to as "electrodynamics." The SI unit of measurement of electric current, the ampere, is named after him.

Alessandro Giuseppe Antonio Anastasio Volta (February 18, 1745 – March 5, 1827) was an Italian physicist known for the invention of the battery in the 1800s. The SI unit of measurement of electric potential, the volt, is named after him.

American radio pioneer and inventor, and co-founder of the American Radio Relay League, Hiram Percy Maxim died February 17, 1936.

And American electrical engineer and inventor, called "the most prolific and influential inventor in radio history," Edwin Howard Armstrong died January 31, 1954. Armstrong invented the regenerative circuit while he was an undergraduate and patented it in 1914, followed by the super-regenerative circuit in 1922, and the superheterodyne receiver in 1918. Armstrong was also the inventor of modern frequency modulation (FM) radio transmission.

NVARC Club Net

The NVARC Club Net meet's every Monday evening at 8 PM on the 442.900 Pepperell repeater.

Stop in and bring your input and questions.

The net is in need of a regular Net Control Station (NCS).

Recent nets have been run by George KB1HFT. Thanks George

The January 26 net was run by Bob W1XP. The primary discussion was on preparations for the Tuesday storm which was forecast to have blizzard conditions. Thanks Bob.

Attendees
W1XP BOB NCS, KW2T Dan,.N1MNX Dave, K1BG Bruce, KD1LE Stan, KB1HFT George, N8VIM Jim, AB1CV Bob.

The February 2nd net was run by George KB1HFT.

Discussion about the new quad core and faster Raspberry Pi, VHF Contest and log submissions, upcoming snow storms, high activity on 10 meter band.

Attendees

Stan KD1LE, Skip K1NKR, Larry W1ESR, George KB1HFT/NCS, Dan KW2T, Larry W1ESR.

Upcoming Contests

2015
February
21 ARRL International DX Contest CW
27 CQ 160 Meter Contest SSB

March
1 North Carolina QSO Party
7-8 ARRL International DX Contest SSB
14 Idaho QSO Party
15 North American Sprint RTTY
15 Wisconsin QSO Party
21 Russian DX Contest
22 North American Sprint SSB
28 CQ WW WPX Contest SSB

April
2 SARL 80 Meter QSO Party
4-5 Mississippi QSO Party
4-5 SP DX Contest
11-12 JIDX CW Contest
11-12 Georgia QSO Party
17-18 Holyland DX Contest
18 EU Spring Sprint SSB
18-19 YU DX Contest
25-26 SP DX RTTY Contest
25-26 Florida QSO Party

May
ARI International DX Contest
2-3 Indiana QSO Party
2-3 New England QSO Party
CQ-M International DX Contest
9-10 Volta WW RTTY Contest
30-31 CQ WW WPX Contest CW

Flea Markets/Hamfests

2015
March
7 Chicopee MA Mt Tom ARA
May
1, 2 Deerfield NH NEARfest
August
21 ARRL New England Convention Boxboro MA
21, 23 Boxboro MA FEMARA NE Convention

Girl Scouts on the Air

Of all month's/years for lot's of snow. I normally try to keep the tower trailer available in case of some emergency. But this year has been a challenge and with a planned Girl Scout event coming up of immediate importance. Skip K1NKR is organizing our support of this activity. There are some activities you may be able to help with; set up tower and tri-bander, helping the scouts with the phonetic alphabet, helping the scouts write and then send their name in Morse code. There may be other items.

Photo Courtesy KD1LE

It may be hard to see, but the shelter behind the van and snow bank is 12 feet tall.

Contact Skip K1NKR if you can help.

Your Article

Your article could have been here which would have eliminated this blank space.

Advertiser

Welcome to our new advertiser.

NVARC
Nashoba Valley
Amateur Radio Club
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http://www.n1nc.org/

President: Skip Youngberg K1NKR
Vice President: Jim Hein N8VIM
Secretary: John Griswold KK1X
Treasurer: Ralph Swick KD1SM
Board Members:
Rod Hersh WA1TAC 2012-2015
Bob Reif: W1XP 2013-2016
Wolf Seidlich KA1VOU 2014-2017

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Photographer: Ralph Swick KD1SM
PIO: Roland Guilmet NR1G
Librarian: Peter Nordberg N1ZRG
Property Master: John Griswold KK1X
N1NC Trustee: Bruce Blain K1BG
Annual membership dues are $15; $20 for a family
Meetings are held on the 3rd Thursday of the month
7:30 p.m. - Pepperell Community Ctr.
Talk-in 146.490 simplex
442.900 + 100Hz Repeater battery power
147.345 + 100 Hz Repeater
53.890 – 100Hz Repeater battery power
This newsletter is published monthly. Submissions, corrections and inquiries should be directed to the newsletter editor. Articles and graphics in most IBM-PC formats are OK.

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