



# SIGNAL



de NINC

March 2010 Volume 19 Number 3

## This Month's Meeting

This month's meeting presentation will be an Intro to CW Skimmer by John KK1X.

Remember the Lantern Battery Challenge logs are due by/at the March meeting.

This month's meeting is Thursday March 18<sup>th</sup> at 7:30

## Last Month's Meeting

Sparing no expense our February program was International Amateur Radio Direction Finding (ARDF) by Mark VK6MD from Australia.

These events are held around the globe annually. Mark recently competed in the 2009 event that was held in the Blue Hills Reservation south of Boston.



Courtesy KK1X

Stan thanks Mark and presents Him with an NVARC mug for his presentation.

Mark works for an area company these days so we didn't have to fly him in from VK land.

In attendance were Ken K1JKR, Leo K1LK, Dennis K1LGQ, Skip, K1NKR, Gary K1YTS, Erica KA1LDP and Drew W1PCQ, George KB1HFT, Stan KD1LE, Pete KB1LZH, John KK1X, Les N1SV, Jim N8VIM, Roland NR1G (formerly W1RLG), Bob W1XP, Rod WA1TAC

## Groton Road Race

The 19th Groton Road Race is only a few weeks away. This year's race is scheduled for Sunday, April 25. This is a big event sponsored by the Squannacook River Runners attracting over a thousand runners to the Town of Groton.

The Groton Police Department has said year after year that the Amateur Radio communications support is a vital part of the success of this event. The runners themselves often stop by to thank operators in person.

Dozens of public safety personnel come in from various services outside the Town and their radios do not all interoperate; filling this communications gap is the role of Amateur Radio. Amateur Radio operators are stationed at key points around the course to provide communications with the course marshals and the public safety officers positioned nearby. The Officers in Charge have said repeatedly over the years that the Town would not be able to sanction this event if Amateur Radio volunteers were not involved.

Ralph KD1SM will be soliciting 36 to 40 volunteers again this year for the event. Some positions require only morning availability, some positions need to be manned all day, but the majority of volunteers are needed only in the afternoon.

This event has been a lot of fun for all involved and we could not ask for better exposure of Ham Radio to the community.

If you are interested in learning more, or if you want to volunteer, please contact Ralph <kd1sm@arrl.net>.

Additional information about the event itself may be found on the race Web site <http://www.grotonroadrace.com>

## Getting On The Air With A Flex5000A

Skip Youngberg, K1NKR

Let me start out with a disclaimer. This is not a brag article. True, the FLEX5000A transceiver is an expensive purchase, but my investment in ham gear over a fifty-year career is a fraction of that of a lot of “high-energy” newbie operators. As an example, it took me two years of paper route savings to afford the \$52.50 for my first rig. I had to get a technician license to keep my expiring novice ticket (one year, non-renewable back then) from putting me out of the hobby!



Now, on to the show. I did it. I celebrated my 50<sup>th</sup> anniversary of licensure by ordering a fully decked-out Flex—the rig, the second receiver, the internal antenna tuner, and the VHF/UHF module. Having worked on what’s known as “software defined radio” technology before retirement, I’m convinced that it’s the way to go. Having played with the F5000A for a week now, I’m convinced that I’m going to learn a lot more about radios, computers, and signal processing.

Downside first. Flex is a small company with a hot product. This means that embarrassments can creep into the sales and delivery process. I ordered via phone on a Thursday afternoon and got an estimated shipping date of the following Tuesday. When I called back on Friday of that week asking where my rig was the rep found out that the shipment hadn’t been made. He corrected the slip-up immediately and I had an e-mail status notice from UPS in less than half an hour. Days after receipt, I found out that the tuner hadn’t been installed in or included with the shipped product. Again, I got satisfaction, and a prioritized UPS shipment, within an hour of informing Flex of the problem.

Upside. This is one well-designed, well-constructed, well-performing hot product!

Surprisingly, PowerSDR, the software that makes the Flex products work, is actually a free download. The source code is, too. One of the other downloads is a very readable 221-page owner’s manual. And there’s a user forum and e-mail reflector to bring new owners up to speed. There is a lot to learn. And as with anything new, a lot is obvious after you think about it. But there’s so much to think about that getting up-and-running is a discovery process. Besides, in true Amateur fashion, the manual is always the last thing you read.

The rig arrived on Thursday at 5:15pm. The club meeting preempted that evening’s experimentation. Nevertheless, I had the rig powered up and connected to my computer early Friday morning. Because of the computational demands of making a radio work in software, a decent horsepower computer is recommended but all I had available was my 2001-vintage Pentium4, 1.8GHz laptop. Surprisingly, it worked. The lowest CPU loading I saw was 76% but it worked. Now that the pressure’s off I’ll hit BJs or Staples at my pocketbook’s convenience.



Bob, W1XP, came over and we spent the afternoon squaring away the software load and then putting the receiver through its paces. The receiver covers 10KHz through 65MHz, direct conversion. Modes are USB and LSB CW; USB, LSB, DSB, AM, FM, and synchronous AM phone; and USB and LSB digital. The receiver detects and displays any 80KHz of spectrum all at once (depending on the sampling rate you specify) and you select which signal you want to demodulate. The selectable and definable filters and the DSP noise reduction make copy a dream.



PowerSDR provides a capability called Multi-RX. It allows you to simultaneously listen to two signals in the rig's 80KHz passband. With Multi-RX and the optional second receiver you have essentially, three independent receivers in one box—two in one band and one that could be in another band entirely. I understand, that there's actually even a way of setting up duplex (simultaneous transmit and receive) operation but I haven't checked out the "how-to's" and "yes-but's."

I've always been intrigued by panadapters and I've gotten reliant on using the spectrum display on my IC-756PRO for situational awareness. The F5000A provides simultaneous pan scope (real time spectrum) and waterfall (spectrum occupancy history) displays. There are also display choices of an accumulated pan scope histogram, transmitted and received audio in the time domain, and two technical displays of the phase characteristics of the incoming signal. Talk about situational awareness! Click-tuning with a mouse allows you to jump immediately from one signal of interest to another. All of a sudden the '756PRO—even coupled to Ham Radio Deluxe—isn't enough.

I finally got around to checking out the transmitter after a weekend of family time. I wasn't disappointed. I carefully connected a dummy load to one of the three antenna ports and set up the 756PRO to monitor my signal. (The main station antenna was on another F5000A port so I could still receive. After a while of "Hello test. This is K1NKR" I realized that I hadn't selected the transmitter routing to go out the dummy load port. So I just went on to make some QSOs. I held the power output to well below the 100 watts the rig is capable of and didn't even turn the compressor on. Reports were all fine for audio quality and consistent in signal strength with the power level I was using.

The graphical user interface is heavy on controls and light on menus. This means there are few of the "product/model idiosyncrasies" or "forgotten option choices" that typically hide behind the front panel of a conventional radio. It also means that you shouldn't be disappointed when you buy a radio that has no knobs (only an on/off switch, a mike connector and a phones jack) on the front panel. Bob noted that the controls and displays in the PowerSDR software actually give you a piece of precision test equipment on your desktop. For example, signal readout is in both absolute power (dBm) and S-units.

This critique has been an admittedly low in technical detail. To try to do so would have been unfair. I'm still using an under-powered computer. I'm using a temporary 4-wire FireWire interface rather than the 6-wire one supplied with the F5000A. Further, the rig isn't grounded as well as any rig should be and the tabletop is full of patch cords. Mostly though, I haven't had enough time to really find my way around all that's available.

There's a lot more to be said. But the real technology jump is in the method of signal processing. I'll put together a club meeting program describing that—probably in May or June.

## Algonquin ARC Flea Market

The Algonquin ARC Flea Market was held February 13<sup>th</sup>. Congratulations to AARC as they drummed up enough interest to get a good turnout. Either that or the fact it is the first flea market of the year and everyone had cabin fever.



Stan KD1LE carpooled down with Bruce K1BG and Ralph KD1SM. Stan's purpose was social

Besides requisite boat anchors and junk It was good to see folks from the area you haven't seen in a while.



Les N1SV(standing center) helped a friend staff his table and of course looked for bargains.

Many club members seen at the event were

Phil KB1JKL, John KK1X, Bruce K1BG, Gary K1YTS, Nancy KB1KEF, Ralph KD1SM, Stan KD1LE, Les N1SV, Rod WA1TAC, Leo K1LK. Also former member Ron W1PLW.

## NVARC Slow Speed CW Net

The NVARC Slow Speed CW Net meets Tuesday and Thursday at 7:30 on 28.123 MHz.

After the net concludes the net moves to 28.423 USB to discuss the evenings net and answer questions.

If anyone is interested in participating there is a handout which may help you understand and follow the net.

If you are not sure enough with sending and receiving the code you can still listen in and participate in the phone session afterwards.

Recent participants Jim N8VIM, Peter N1ZRG, John KK1X, Bob W1XP, Roland NR1G, Skip K1NKR. Bruce K1BG and Stan KD1LE have been net control stations.

## NVARC Net

The NVARC net meets on 442.900 N1MNX repeater Mondays at 8:00 PM. The net is for sharing information and asking questions.

Recent topics software defined radios, upcoming events, Last Call for SK, Lantern Battery Challenge activity.

Recent check ins Jim N8VIM, Les N1SV, Stan KD1LE, Larry KB1ESR, Gary K1YTS, Skip K1NKR, Ed K1ZZ, Dick W1LTN, Bob W1XP.

## PSLIST

Every event needs communications volunteers

- Squannacook River Canoe and Kayak Race - 17 April
- Adopt-a-Highway cleanup starts - 18 April
- Groton Road Race - 25 April
- Parker Road Race - 23 May
- Field Day - 26-27 June
- Longsjo Classic - 2-5 July

- Memory Ride for Alzheimer's Research - 24 July

See [www.n1nc.org/Events](http://www.n1nc.org/Events) for the latest information

### Board Meeting

Discussion of upcoming meeting presentations. No program firm. John, Larry, and Stan are each working on a possible program.

Ralph submitting the Treasurers report for the newsletter. Will update the PSlist.

Discussed the Lantern Battery Challenge awards. After the logs are submitted categories will be determined by the Awards Committee. Discussed possible items that might be used as awards.

The Board has decided to continue in the MassHighways Adopt a Highway program for this year.

Discussed the Groton Road Race and possible APRS support for lead, course control and sweep vehicles.

Discussed the slow speed CW net operation which has been going very well thanks to Bruce K1BG. Participation has been six to eight people which is very good. Discussed how things are working from the beginners perspective and anything that might improve how it is working for them. One reminder. When you check in you should transmit at a speed appropriate to all the other participants. In other words, slow.

Chocolate Chip Brownies cookies were served.

In attendance were Stan KD1LE, Peter N1ZRG, Larry, Skip K1NKR and John KK1X.

### Adopt A Highway

At the Board Meeting there was a discussion about whether we should continue in the MassHighway Adopt A Highway Program. It was felt that we get good publicity and recognition from this activity and though it is not a radio activity it is still a public service and should continue.

### Treasurers Report

Income for February was \$7.64 from bank interest and a \$20 donation. Expenses were \$17.60 for newsletter postage and \$70 for the Post Office box

annual rental leaving a net expense of \$59.95 for the month.

Current balances:

|                |            |
|----------------|------------|
| General fund   | \$4,075.31 |
| Community fund | \$3,771.41 |

As of 8 March we have 45 members who are current with their dues and 22 renewals outstanding. Please check your renewal status on the roster circulated at the monthly meeting or ask Ralph.

If your ARRL membership is ready for renewal, you can let Ralph mail it in for you and the Club will get a commission. If you're interested in joining the ARRL and do so through Ralph the Club will get a bigger commission. ARRL membership checks should be made payable to NVARC so that our commission can be deducted before we forward your membership to Newington.

Ralph KD1SM

### Upcoming Club Activities

April

First Road Cleanup

25<sup>th</sup> Groton Road Race

April Club Meeting Elections

May

23rd Parker Road Race

June

Field Day

### ARRL Letter

#### ARRL Seeks Input for New IARU Region 2 Band Plan

The International Amateur Radio Region 2 conference -- held later this year in El Salvador -- brings together delegations from the national Amateur Radio Societies in the Western Hemisphere. One of the topics on the agenda will be the Region 2 HF band plan. This band plan is "harmonized with" -- spectrum management-speak for "very similar to" -- the IARU Region 1 and Region 3 band plans. At this year's conference, the IARU Member-Societies will consider possible changes to the Region 2 band plan. The ARRL is cooperating with this procedure by inviting input to be sent to the ARRL Board of Directors' Band Planning Committee. The committee will review the existing Region 2 band plan, consider

input from the amateur community and make recommendations to the ARRL Board for submission to IARU Region 2.

#### **Public Service: Radio Club de Chile Active after Earthquake**

On Monday, March 1, IARU Region 2 President Reinaldo Leandro, YV5AMH, spoke via telephone with Radio Club de Chile (RCCH) President Dr Galdino Besomi, CE3PG, regarding the 8.8 magnitude earthquake that struck the South American nation on Saturday, February 27. "He informed me that soon after the earthquake, an Emergency Net was activated in the whole country -- first on VHF and then on HF. All the RCCH Board and club members are actively working in close coordination with civil and military authorities," Leandro posted to the IARU Region 2 e-mail reflector. "Three days after the earthquake, the requests for news about people in the affected areas is one of the main activities occupying the Chilean radio amateurs."

#### **Public Service: Hawaii Hams Spurred to Action by Chilean Earthquake**

On Saturday, February 27 -- in reaction to a tsunami warning triggered by the Chilean earthquake -- 60 Amateur Radio operators participated in a tsunami radio net that operated throughout the island State of Hawaii. More than 25 real-time reports from observers around the state were relayed simultaneously to the State Emergency Operating Center (EOC) and the four county EOCs, providing timely information via Amateur Radio on sea level changes to emergency management officials.

#### **FCC News: FCC Seeks Comments for Blanket Waiver to Allow Amateur Radio in Hospital Emergency Drills**

In February 2010, the American Hospital Association (AHA) filed a request with the FCC for a blanket waiver of Section 97.113(a)(3) of the Commission's Rules "to permit hospitals seeking accreditation to use Amateur Radio operators who are hospital employees to transmit communications on behalf of the hospital as part of emergency preparedness drills." On March 3, the FCC issued a Public Notice -- WP Docket 10-54 -- seeking comments if the Commission "should grant AHA's request for a blanket waiver of Section 97.113(a)(3) to permit amateur operators who are hospital employees to participate in emergency drills that are conducted by hospitals for accreditation purposes and that are not government-sponsored." Section 97.113(a)(3) specifically prohibits its amateur stations from transmitting communica-

tions "in which the station licensee or control operator has a pecuniary interest, including communications on behalf of an employer."

#### **FCC News: FCC Reaffirms Statement on ROS**

In mid-February, European amateurs first used a new, experimental digital mode known as ROS. On February 23, 2010 -- after FCC review of the original documents provided from the developer's Web site - - the FCC made a statement on ROS. The ARRL supports -- as one of the basic purposes of Amateur Radio -- the experimentation and advancing the technical skills of operators. The development and use of any new mode is exciting to many amateurs, and the League encourage amateurs to experiment within the parameters of the rules; however, the ARRL also reminds US licensees that according to Section 97.307, spread spectrum communications are only permissible in the US on frequencies above 222 MHz. Read more, including what the FCC had to say about ROS, here.

#### **Public Service : Amateur Radio Operators Wrap Up Communications Support in Haiti**

After the 7.0 magnitude earthquake struck the island nation of Haiti on January 12, many Amateur Radio operators asked how they could volunteer their time and service to assist with communications support. When Project Medishare -- a partnership between the University of Miami Medical School (UM) and physicians and health officials in Haiti -- needed help with their communications, Amateur Radio operators were quick to respond. According to Jack Satterfield, W4GRJ/AFA4DG, Medishare has constructed several health clinics in Haiti over the years -- all of which were destroyed in the earthquake. "Medishare was able to rapidly deploy medical teams and assets to begin the overwhelming task facing the post earthquake medical needs," he told the ARRL.

WX4NHC Coordinator John McHugh, K4AG, Dr Dale Botwin, KR4OR, and WX4NHC Assistant Coordinator Julio Ripoll, WD4R, helped to coordinate the Amateur Radio communications support in Haiti for Project Medishare.

"UM Vice President for Facilities and Operations Ron Bogue was the Director in Charge of the Haiti operations. His concern about the unreliable communications caused him to contact Julio Ripoll, WD4R, with whom he has worked for years as the architect for UM Medical facilities. Ron knew that Julio is a ham radio operator and very involved with the National Hurricane Center in Miami and its Amateur Radio station, WX4NHC. Ripoll then contacted ARRL to

request help in soliciting volunteers. ARRL immediately sent down an HF Go Kit -- through the ARRL's Ham Aid Program -- and put Ripoll in touch with ARRL West Central Florida Section Emergency Coordinator and Navy MARS Florida State Deputy Director Neil Lauritsen, W4NHL/NNN0TFH.

### **Amateur Radio in Space: A Close Encounter for AMSAT-OSCAR 51**

While many in North America were fast asleep Monday morning, March 1, the AMSAT-OSCAR 51 (AO-51) satellite had a potentially dangerous encounter with another spacecraft known as Formosat 3D. OSCAR 51 is a popular Amateur Radio satellite that often functions as a crossband FM repeater, relaying brief conversations over hundreds of miles. Formosat 3D is part of a constellation of six remote sensing microsattellites that collect atmospheric data for weather prediction and for ionosphere, climate and gravity research. Both orbit at an altitude of approximately 500 miles.

### **Silent Key : TAPR President Emeritus Dr David Toth, VE3GYQ (SK)**

#### **Dr David Toth, VE2GYQ (SK)**

Dr David Toth, VE3GYQ -- President Emeritus of Tucson Amateur Packet Radio (TAPR) -- passed away Friday, February 26 after a long battle with cancer. He was 55. A resident of Spencerville, Ohio, Toth served as a Director and Executive Vice President of TAPR in the 1980s and was elected President of the organization in September 2005. With his advancing illness, he decided not to stand for reelection last October and was instead named President Emeritus with Steve Bible, N7HPR, taking the reins as TAPR President. Read more here.

W1AW News: March W1AW/West Coast Qualifying Run Schedule

The March schedules for the W1AW and West Coast Qualifying Runs were inadvertently left out of the March issue of QST. The March schedules for W1AW are as follows: Friday, March 5 at 10 PM EST (Saturday, March 6 at 0300 UTC) for 10-25 WPM and Tuesday, March 16 at 7 PM EDT (2300 UTC) for 10-40 WPM. The West Coast Qualifying run will be transmitted by station K6KPH on Saturday, March 13 at 2 PM PDT (2200 UTC) for 10-35 WPM. The run will be transmitted simultaneously on 3581.5, 7047.5, 14047.5, 18097.5 and 21067.5 kHz. This Week on the Radio

This week, look for the ARRL International DX Contest (SSB) on March 6-7. The Wake-Up! QRP Sprint

is March 6 and the DARC 10 Meter Digital Contest is March 7. The CLARA HF Contest is March 9-10 (continuing on March 13-14) and the CWops Mini-CWT Test is March 10-11. Next week, the Feld Hell Sprint is March 13. The RSGB Commonwealth Contest, the Elecraft QSO Party and the Idaho QSO Party are March 13-14. The North American Sprint (RTTY) and the SKCC Weekend Sprint are March 14. The Wisconsin QSO Party is March 14-15 and the NAQCC Straight Key/Bug Sprint is March 18. All dates, unless otherwise stated, are UTC. See the ARRL Contest Branch page, the ARRL Contest Update and the WA7BNM Contest Calendar for more info. Looking for a Special Event station? Be sure to check out the ARRL Special Event Station Web page.

### **FCC NEWS: FCC Allows Robotic Device in Amateur Band**

In January 2008, a company called ReconRobotics filed a request with the FCC for a waiver of Part 90 of the Commission's Rules with respect to the Recon Scout -- a remote-controlled, maneuverable surveillance robot designed for use in areas that may be too hazardous for human entry. A waiver is required to permit licensing of the Recon Scout because the device operates in the 430-448 MHz band, which is allocated to the Federal Government Radiolocation service on a primary basis, as well as the Amateur Radio Service and certain non-federal radiolocation systems on a secondary basis. More than two years later, the FCC granted the waiver request in the form of an Order (WP Docket No 08-63), subject to certain conditions.

In its comments filed in May 2008, the ARRL called on the FCC to deny ReconRobotics waiver request, "either permanently or even temporarily." The FCC noted in the waiver that they had received more than 70 comments "generally consist[ing] of public safety and law enforcement entities supporting the waiver request, and amateur radio operators opposing it." In their initial waiver request, ReconRobotics asserted that even though the device operates in an area allocated to other services, including Amateur Radio, the Recon Scout operates with only 1 W peak power and it is "unlikely to cause interference to these services."

The FCC noted in the Order that they had received more than 70 comments "generally consist[ing] of public safety and law enforcement entities supporting the waiver request, and amateur radio operators opposing it." In their initial waiver request, ReconRobotics asserted that even though the device operates in an area allocated to other services, including Amateur Radio, the Recon Scout operates with only 1 W

peak power and it is "unlikely to cause interference to these services."

### **Public Service: Injured Colorado Skier Uses Amateur Radio to Summon Help**

When Steve Priem, N0YIV, of Boulder, Colorado, decided to go backcountry skiing near Yankee Doodle Lake in the Guinn Mountain area of Colorado's Roosevelt National Forest on Friday, February 19, the 60 year old ham made sure he was well prepared: Not only did he take along a rescue whistle, he made sure his handheld transceiver was fully charged and in his pack.

It's a good thing he did: When Priem was injured while skiing, he used his radio to summon help. According to ARRL Colorado Section Manager Jeff Ryan, K0RM, a ham more than 100 miles away in Colorado Springs answered Priem's call for help and called 911. Priem was able to provide GPS coordinates for his position.

### **Amateur Radio Direction Finding: Foxes, Fitness and Fun in 2010**

By ARRL ARDF Coordinator Joe Moell, K0OV

"Geeks in the woods!" That's how Jay Hennigan, WB6RDV, of Goleta, California, describes Amateur Radio Direction Finding (ARDF). Several times a year, Jay gets together with friends for a session of this international Amateur Radio sport -- also called foxtailing and radio-orienteering. As they set out, five 2 meter "foxes" are somewhere in the woods, transmitting for one minute each in sequence. Armed with a special ARDF set or just a handheld transceiver with a measuring-tape Yagi and attenuator, they see how fast they can run or walk from the start to each transmitter in optimum order and then back to the start, or perhaps to a separate finish point. To help them navigate, they carry compasses and special orienteering maps, but they aren't allowed to have GPS displays or other high-tech navigation aids. Standardized ARDF courses provide a good test of equipment performance and hunter skill. It's friendly competition combined with great exercise. It attracts "techies" and "jocks" of all ages who don't need a ham license to get started. And for some, it leads to medals at national and international competitions.

### **International News: Iceland Amateurs Receive New Privileges**

As of Friday, February 19, Iceland's Post and Telecom Administration (PTA) granted temporary experimental access to the 4 and 600 meter bands at

least through the end of 2010, according to Islenzkir Radioamatorar (IRA) President Jonas Bjarnason, TF2JB; the ITA is Iceland's IARU Member-Society. After obtaining a special license from the PTA, Bjarnason said that TF stations with "N" or "G" class licenses may now operate between 493-510 kHz and 70.000-70.200 MHz running 100 W. Amateur operations on both bands are granted on a secondary basis.

### **On-the-Air : Calling All Rookies -- and Non-Rookies, Too! Get On the Air for the ARRL Rookie Roundup**

The ARRL Rookie Roundup is designed to help newly licensed amateurs build their operating skills on HF. It is a contest specifically for those new to Amateur Radio, similar to the ARRL Novice Roundup that ran from 1952 until 1995. The Rookie Roundup brings the fun and Elmering of the old Novice Roundup into the 21st century. Three Rookie Roundups will be held each calendar year: SSB in April, RTTY in August and CW in December. Read more here.

### **ARRL Publications: QEX -- the March/April 2010 Issue**

The March/April issue of QEX is coming soon, and it is full of theoretical and practical technical articles that you won't want to miss. QEX is the ARRL's "Forum for Communications Experimenters." Published bimonthly, it features technical articles, columns and other items of interest to radio amateurs and communications professionals. The mission of QEX is threefold: To provide a medium for the exchange of ideas and information among Amateur Radio experimenters; to document advanced technical work in the Amateur Radio field, and to support efforts to advance the state of the Amateur Radio art. QEX is edited by Larry Wolfgang, WR1B. Subscribe to QEX today.

## 2010 Flea Markets/Conventions

March  
20 ECARA Pomfret CT

April  
11 FARA Flea Framingham  
18 MIT  
30 NEARfest, Deerfield NH

May  
1 NEARfest Deerfield NH  
16 MIT

August  
27-29 ARRL NE Convention, Boxborough

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Tell them you saw it in the Signal. Advertisers should contact the NVARC Treasurer for information.

## Upcoming Operating Events

March  
27 CQ WW WPX Contest SSB

June  
12-14 ARRL June VHF QSO Party  
19 Kids Day  
26 ARRL Field Day

July  
10-11 IARU HF World Championships

For further info on these and other contests refer to;  
<http://www.hornucopia.com/contestcal/index.html>.



## Nashoba Valley Amateur Radio Club

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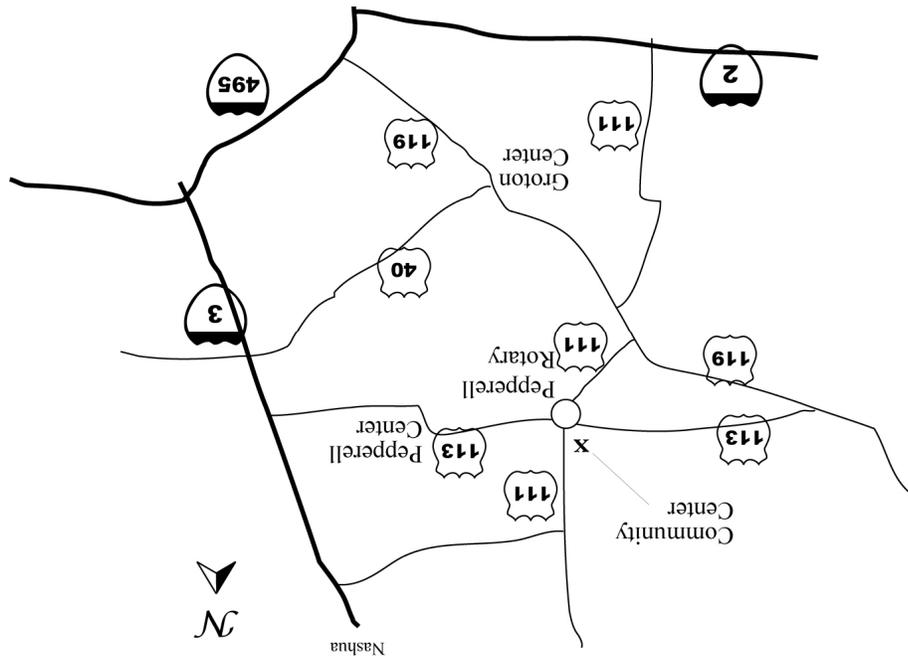
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Vice President: Peter Nordberg N1ZRG  
Secretary: John Griswold KK1X  
Treasurer: Ralph Swick KD1SM

Board Members:

Bob Reif: W1XP 2007-2010  
Skip Youngberg K1NKR 2008-2011  
Joel Magid W1JMM 2009-2012

Editor: Stan Pozerski KD1LE  
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Photographer: Ralph Swick KD1SM  
PIO: Dave Peabody N1MNX  
Librarian: Peter Nordberg N1ZRG  
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Meetings are held on the 3rd Thursday of the month  
7:30 p.m. - Pepperell Community Ctr.  
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442.900 + 100Hz Repeater battery power  
147.345 + 100 Hz Repeater  
53.890 – 100Hz Repeater battery power  
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