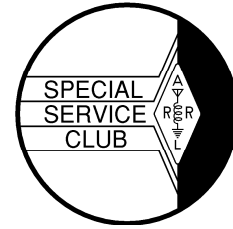




# SIGNAL



de NINC

August 2008 Volume 17 Number 8

## This Month's Meeting

We have no regular meeting in August.

Next club meeting is Thursday September 18th

The road cleanup is Sunday August 24<sup>th</sup>. We need to have eight people there to make it go quickly.

Meeting site info and maps on the back page and the NVARC Website.

Wear your badge to the meeting so new members can tell your name and you can introduce your self to them. It may be worth your while.

## Alzheimer's Association Memory Ride



Courtesy KD1LE

Above is the Net Control shelter. A simple set up with two radios monitoring the three frequencies we used. The antennas are mounted on the masts at opposite corners. The shelter was right behind the three large tents that held volunteers, registration, and food.

On July 26<sup>th</sup> we provided communications for the Alzheimer's Association Memory Ride which was run from the Devens Museum parking lot. Ralph KD1SM organized the support. This is the broadest coverage event we have managed with stations from Berlin and Sterling in Mass to Nashua NH. We had hams from the Central Mass ARA, NVARC and MARA participating. Due to the wide area involved the hams didn't meet at a central location but rather reported directly to their assignments.



Courtesy KD1SM

Above the instructions, maps, radios, and Amateur Radio literature at the Net Control Station.



Courtesy KD1LE

Above the riders are getting their safety instructions before starting out on their ride. There were 25 mile, 62 mile Metric Century and 100 mile Century rides with two hours between starts. After those starts all three courses were active for most of the day. We ran the communications primarily on the 146.970 Paxton repeater with the permission of the Central Mass Amateur Radio Association. We also used the N1MNX six meter repeater for North area coverage and had the Fitchburg 147.315 repeater as a backup. Communications went very well and coverage was good using only two of the repeaters.



Courtesy KD1SM

This is the first year the Alzheimer's Association had used Hams though some of the staff had experience with using them. They were very pleased with the way things went. One comment was that instead of just reacting to problems, with the information they were receiving, they could be proactive in managing the ride. While the net control station was placed off by itself behind the tents for food, registration, and volunteer management, it quickly became the center of interest as the race directors sat there for most of the event asking for information and directing the actions of the many vehicles on the courses. There were six vehicles including two medical, three transports and the pit stop coordinator. Two vehicles did not have space for an additional operator so they were outfitted with a radio for receive only to monitor activity. In one case we were looking for three riders who had not checked in at a pit stop. One of the receive only stations was able to provide their location.

Since they sought us out it is good to know that after all was said and done they still thought they had made a good decision. After things were mostly wrapped up we had an informal discussion about what could be improved. When Larry KB1ESR prefaced his comments with "well if we did this next year..." The immediate response was that "if" was

not an acceptable answer and we would be back next year.

Thanks to Darryl WA1GON, John KK1X, Stan KD1LE, Larry KB1ESR, Tom K1JHC, John N2YHK, Mark WB1ARZ, Bob AB1CV, Gary K1YTS, Dave KB1MVN, Ross, KB1MGD and Ralph KD1SM.

*Subject: Memory Ride  
Date: Thu, 14 Aug 2008 11:42:02 -0500  
From: "Carolyn Whipple"*

*Thank you Nashoba Valley Amateur Radio Club!*

*On Saturday, July 26, the Alzheimer's Association was proud to support the 230 amateur and seasoned cyclists that participated in the 12th annual Memory Ride event. The Alzheimer's Association is grateful to the support and expertise the Nashoba Valley Amateur Radio Club members provided to cyclists, volunteers and Association staff. For the first time in the event's history, pit stop leaders, support and gear vehicles, emergency personnel, event coordinators and others were able to communicate in an efficient manner to ensure the safety of all riders. We couldn't have done it without the support of amateur radio volunteers-thank you!*

*Memory Ride was a success thanks to the hundreds of volunteers and cyclists who were involved. Over \$350,000 has been raised to date and supports the Alzheimer's Association research program by providing critical funds to Massachusetts based researchers searching for a cure. Thanks to donors, the Association has become the largest private, nonprofit funder of Alzheimer research. The Alzheimer's Association's mission is to eliminate Alzheimer's disease through the advancement of research; to provide and enhance care and support for all affected; and to reduce the risk of dementia through the promotion of brain health.*

*Thank you again for moving us closer to a cure for Alzheimer's.*

*Carolyn Whipple  
Development Manager  
Alzheimer's Association, MAINH Chapter  
the compassion to care, the leadership to conquer*

*311 Arsenal Street / Watertown, MA 02472  
800.272.3900 Helpline  
<http://www.alz.org/MA>*

**Need a Ride?**

Do you need a ride to the club meetings? Do you know someone who does? If you do please contact Bob W1XP 978-448-6559 and leave a message. We'll see that you get to the meeting.

### Distant Signals

Apparently the Signal still has widespread readership. Although it was not quite the distance equal of the Tanzanian connection (see the Signal February 2007). A request to reprint several articles written by members Bob W1XP and Stan KD1LE for the Signal. was received from the editor of the Yavapai Amateur Radio Club newsletter. The club is from Prescott Arizona. Interestingly the club newsletter is the Yavapai Signal.

### Field Day

Three weeks after Field Day (FD) and it is finally over for some of us.

It takes a lot more than showing up on Friday of FD weekend to make it successful. Months before FD people are planning for the aspects they have an interest in. This may be antennas for a station, computers and logging software, food, power systems or any of the other pieces of FD. As the months tick off these individual actions meld into the overall Field Day plan.

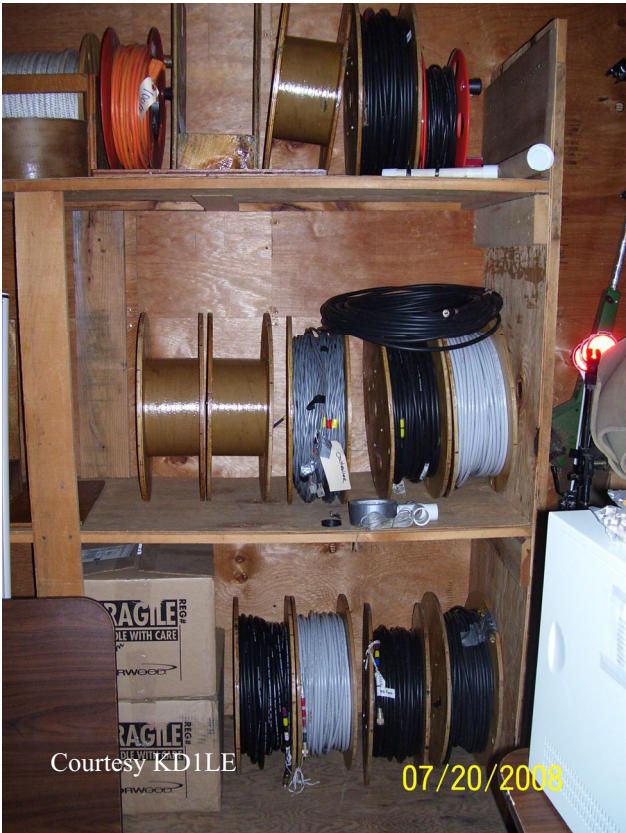
Where does Field Day go after Field Day? It takes weeks for the people who do the planning and provide equipment to unpack and put away the equipment used for FD.



CW 20 meter antenna and tri band antennas go back on the walls at FoxFinder Industries.



The FD computers need to be set up so that the logs can be extracted. Then the logs needed to be cleaned up, sorted and counted in preparation for submitting the results to the ARRL which must happen within 30 days of Field Day.



Various feedlines such as coax and open wire feed lines needed to be rerolled, marked and put away.

After all the numbers are collected from the computers and the material supporting the bonus items the FD data is entered into the ARRL Contest Robot

which totals the numbers, creates the submission and emails you a report.

Our Field Day Stats looks like

Station	QSO's
CW	769
SSB	468
V/UHF 6M	204 plus 3 Satellite
GOTA	17

We claimed 820 bonus points for a total submitted score of 4,460 points.

***Your friendly and infinitely cheerful Field Day Coordinator wishes to declare another rousing successful operation with smiling faces all around! The first person to challenge this statement is the automatic successor to the august position of Field Day Coordinator 2009.***

***The support from the meal preparation folks was outstanding in every sense. Thank You Lynda for Saturday Lunch. Some of us remembered you fondly much later in the night with leftover sandwiches. Peg and Karen and Jeanine cooked for the masses Saturday evening and the Hobo beans and Honey glazed Ham carried us well into the night, topped by Pegs cupcakes and an abandon Pie. The sunshine cooks where Cindy and myself, not much left over for the wild criters. This group can really clean the plates.***

***There are some changes for next year. A better understanding of the GOTA station rules (before the station is turned on) would help. Sorry Susan, I will personally see that you get a clean shot at the GOTA station next year. The station will be located in a tent that promotes open and unfettered direction from the person that holds the station license. Changes will be kept to a very low level.***

***I'm not one to count contacts as the Field Day experience is for all to enjoy, We do well each year and if anything I would like to see more fresh faces. Darryl, Susan and Lee were the new faces and welcome to the event.***

***And remember that its never to soon to start planning for next year's event.***

***Thank You all for making this year a success....73 Larry***

Larry pointed out several important things in his message above. First and foremost we had a successful Field Day and had fun. Second it is never

too early to start planning for next year's event. This doesn't mean that we need to be planning year round for Field Day. But the problems we have on FD are the same ones we would have for any emergency event so they are worth resolving. One of the things I do during and right after Field Day is take some notes on what went well and what could be improved or changed. I personally decided to tackle two problems I had this year. How do you roll up all the string used for the dipole antennas after FD. Leo K1LK and I took on the challenge by creating several different solutions. The other challenge was to isolate the AC power loads that are supplied by the generator so that a single leg fault does not trip the entire system. That solution is still under development but should be available for next Field Day.

Stan

### Members and Friends in other Activities

I was scanning the Conservation Commission page on the Town of Pepperell Website since we use the Heald St Orchard for Field Day each year. From there I saw a link to the Nashoba Conservation Trust Website. Their Summer Newsletter (link on the top page) has several articles by people we know.

Rob Rand of the Conservation Commission who mows the grass for us in the Orchard has an article "Breakfast with the Birds". This is apparently a scheduled event that is publicized through the Town Website and the Nashoba Conservation Trust Website as well as the local newspapers.

Erik Stromsted W1ZBT has an article on Bobolinks and other birds found on the Nissitissit Meadows conservation land in Pepperell.

BTW we are listed on the Town of Pepperell Website on the "Community Organization" page with a link to our Webpage.

Stan KD1LE

### NVARC Cookout

The weather for the cookout seemed ominous with rain falling heavily on the drive over. But as you can see from the pictures it turned out a sunny and comfortable day. We cooked, ate, and chatted away the afternoon.



Above (L) Jane , (C and R) Joyce and Skip our Hostess and Host. Below Jim N8VIM, Bruce K1BG and Dennis K1LGQ



The cookout was hosted by Skip K1NKR and his XYL Joyce. In attendance were Stan KD1LE, Bruce K1BG and XYL Jane, Dennis K1LGQ, Larry KB1ESR, John KK1X and XYL Peg and Jim N8VIM.

We thank Skip and Joyce for their hospitality.

### PSLIST

Every event needs communications volunteers

Date	Location	Event	Contact	Tel/Email
Sept				
7	Hopkinton MA	Triathlon	John N2YHK	
12	Franconia	Reach the Beach	Dave WA1ZCN	
13	Hampton	Reach the Beach	Dave WA1ZCN	
21	Hopkinton	Jimmy Fund Walk	Steve W3EVE	
Oct				
4	Bristol NH	NH Marathon 10K	Dave KA1VJU	

### Board Meeting

- Field Day expense wrap-up
- Renewed Community Center for meetings
- Yearbook updates in Fall
- September and October meeting speakers
- Additional sorting boxes need help ripping plywood
- Road Cleanup
- NMAEPC meeting update

### Adopt A Highway

Next road cleanup is Sunday, August 24th.

### Treasurers Report

Income for July was \$20 in membership dues and \$4 in ARRL renewal rebates. Expenses were \$16.80 for newsletter postage and \$440.99 for Field Day, leaving a net expense of \$433.79 for the month.

I believe that all of the Field Day expenses have been submitted for reimbursement. Please let me know if you have something you believe the Club should reimburse that you have not yet submitted.

Current balances:

General fund	\$4,053.14
Community fund	\$2,386.83

As of 14 August we have 62 members who are current with their dues and 7 renewals outstanding. Please check the member roster that is circulated at the monthly meeting if you do not remember your renewal date. Your membership date also appears on your newsletter mailing label. You can always ask Ralph if you are in doubt.

If you are not yet an ARRL member please consider joining and showing your support for the programs developed by our national organization. If you let me send in your membership then the Club pays for the stamp and receives a portion of your ARRL dues. Bring your check to a Club meeting or to Saturday breakfast payable to NVARC in the amount of your ARRL renewal and Ralph will do the rest.

Ralph KD1SM

## ARRL Letter

### STATION MANAGER EXPLAINS NN3SI'S SILENCE

ARRL has received numerous e-mails asking for information on why NN3SI <<http://americanhistory.si.edu/events/programdetail.cfm?newskey=48>>, the Amateur Radio station at the Smithsonian Institution's National Museum of American History (NMAH) was closed after more than 32 years of operation <<http://www.arrl.org/news/stories/2008/07/30/10231/?nc=1>>. According to Hal Wallace, NN3SI Station Manager and Associate Curator for the Museum's electricity collections, there will be no appropriate place to house the station once the Museum reopens this fall after undergoing an extensive renovation.

"NN3SI ceased operating from the National Museum of American History on July 31," Wallace told the ARRL. "As you may know, NMAH has been undergoing a renovation of the building's infrastructure and interior for some time. The renovation forced us to remove the Information Age exhibition -- the station's home since 1990. We placed the station in a temporary location for the duration of the renovation but it cannot remain there when we reopen to the public later this year. The Information Age exhibit will not be reinstalled, and since we have no other appropriate exhibition areas within the Museum, the station had to cease operations at NMAH. Various alternate locations throughout the Smithsonian have been considered but none are viable at this time."

Wallace said that the station's license is valid until 2013 and its equipment will go into storage: "John Johnston, W3 BE -- NN3SI's trustee -- assures me that a renewal of the license would not be an issue if we need one. Should a suitable exhibition area elsewhere in the [Smithsonian] Institution be found, we will be able to reactivate the NN3SI activity."

### FIFTH ANNUAL NATIONAL PREPAREDNESS MONTH COMING IN SEPTEMBER

The US Department of Homeland Security announced in July that more than 1200 national, regional, state and local businesses and organizations -- including several Amateur Radio groups -- have pledged their support and joined the 2008 National Preparedness Month Coalition <<http://www.ready.gov/america/npm08/intro.html>>. Sponsored by the department's "Ready" campaign, National Preparedness Month helps to raise aware-

ness and promote action by Americans, businesses and communities on emergency preparedness.

"As we approach our fifth National Preparedness Month, I want to thank the hundreds of coalition members who are making a difference in their communities by helping raise the basic level of preparedness in our country," said Homeland Security Secretary Michael Chertoff. "Individual preparedness is the cornerstone of emergency preparedness. Experience shows that if Americans take steps ahead of time, they stand a much better chance of coming through an emergency unharmed and recovering more quickly."

"The 'Ready' campaign and Citizen Corps <http://www.citizencorps.gov> are specifically encouraging individuals across the nation to take important preparedness steps," said ARRL Public Relations and Media Manager Allen Pitts, W1AGP. "These steps include getting an emergency supply kit, making a family emergency plan, being informed about the different emergencies that may affect them, as well as taking the necessary steps to get trained and become engaged in community preparedness and response efforts."

National Preparedness Month Coalition members have agreed to distribute emergency preparedness information and sponsor activities across the country that will promote emergency preparedness. Membership is open to all public and private sector organizations. Sign up your club or ARES group now! Groups and individuals can register to become members by visiting the Ready Web site <<http://www.ready.gov>> and clicking on the National Preparedness Month banner.

For more information on the Ready Campaign and National Preparedness Month, please visit <<http://www.ready.gov>> or <<http://www.listo.gov>> for information in Spanish. Information is also available by phone at 1-800-BE-READY or 1-888-SE-LISTO (in Spanish).

According to Pitts, linking up with the Ready.gov people and participating in September's National Preparedness Month is "an easy win. The federal people are already doing all the hard work. All you really have to do is sign up. Most clubs and ARES groups are already doing activities which fit into their structure, so why not get credit for your actions? Of course, if you do something more with this opportunity, so much the better! But you have to sign your group in and no one can do that for you. There are hundreds of ARES groups and clubs in the country. Wouldn't it be fun to have even 70 percent of them sign up and get noticed?"

## HF DIGITAL VOICE PROGRAMS ONCE AGAIN AVAILABLE FOR DOWNLOAD

Citing codec (coding/decoding) licensing issues, three free Windows programs for sound card-based HF digital voice were yanked from their download site for a short time recently, surprising hams who are interested in HF digital voice operation; several online groups that supported the software were also closed for a short time.

WinDRM, DRMDV and FDMDV, all written by Cesco Lanza, HB9TLK, used a codec that was developed for the US Department of Defense and NATO. Rights to various forms of the codec are held by several companies. According to Gary Pearce, KN4AQ, the companies have "winked" at ham radio use for several years, but a recent complaint caused the programs to be pulled from the download site. "Lanza did a quick rewrite to use an open-source codec, and now WinDRM and FDMDV are back," Pearce said. "DRMDV, an intermediate program between the other two, has been abandoned. WinDRM could always use the open-source Speex codec, but FDMDV users will need to download the new version."

Pearce said these three programs all allow hams to transmit and receive digital voice by connecting their PC sound card to an ordinary SSB transceiver: "The result has been surprisingly high quality audio, with virtually no noise -- sort of like listening to FM, but in the narrow bandwidth of a sideband signal. WinDRM, the best sounding program, uses 2.5 kHz of spectrum. FDMDV sounds a little rougher, but uses only 1.1 kHz of spectrum. They both use OFDM modulation, a set of close-spaced carriers that are each modulated with a little bit of data to add up to the final digital signal. The main problem with HF digital voice is that it needs fairly strong signals. FDMDV works better with weaker signals than WinDRM."

Pearce said that none of the available open-source codecs work as well as the old one: "MELP <<http://en.wikipedia.org/wiki/MELP>>, or Mixed Excitation Linear Prediction, was designed specifically for high-quality, low data-rate voice communication. So the on-air audio might suffer some with the new version. Digital voice users have been waiting and hoping for someone to concentrate on developing a codec optimized for ham radio use, but none has been forthcoming."

FDMDV and WinDRM can both be downloaded from Jason Buchanan's, N1SU, Web site <<http://www.n1su.com/>>.

The AOR digital voice modems and D-STAR radios both use the AMBE 2020 vocoder, and are not affected by the coding changes; the AMBE 2020 vocoder is a proprietary chip that is embedded in each unit.

For more information on WinDRM, check out QST Editor Steve Ford's, WB8IMY, article ["Life Could Be a DReaM," pages 38-40] in the April 2007 issue of QST.

## DUTCH AMATEUR RADIO SATELLITE NOW LIVE

The linear transponder aboard the new Dutch OSCAR 64 satellite <<http://www.arrl.org/news/stories/2008/05/22/10117/?nc=1>> (otherwise known as Delfi-C3 <<http://www.delfic3.nl/>>) is now open for CW and SSB operation.

The spacecraft boots into transponder mode whenever it is in full sunlight. Ground controllers will briefly switch the satellite to either "basic" or "science" configuration once every two weeks; otherwise, the linear transponder will be the default mode. The transponder uplink passband is from 435.530-435.570 MHz with a downlink passband from 145.880-145.930 MHz. The transponder CW beacon can be heard at 145.870 MHz.

Delfi C-3 was successfully launched April 28, 2008 from India aboard a Polar launch vehicle <<http://www.arrl.org/news/stories/2008/04/28/10067/?nc=1>> and was successfully commissioned, currently transmitting telemetry on the 2 meter amateur band. In addition to its 2 meter downlink, Delfi C-3 has an uplink on the 70 cm band.

The satellite was developed by a team of some 60 students and faculty members from various polytechnic schools in The Netherlands. Delfi C-3 carries two experiments -- one involving thin film solar cells developed by Dutch Space, and an autonomous wireless Sun sensor from the Dutch Government Research Institute (TNO). E-mail reports are welcome <[info@delfic3.nl](mailto:info@delfic3.nl)>.

## HIRAM PERCY MAXIM'S TELEGRAPH KEY RETURNS TO ARRL HQ

At the ARRL Board of Director's meeting this past weekend, the telegraph key that once belonged to Hiram Percy Maxim, W1AW, was returned to ARRL Headquarters. According to ARRL First Vice President Kay Craigie, N3KN, the key had been in the collection of the Antique Wireless Association's Electronic Communication Museum near Rochester, New York for more than 20 years.

Craigie said that the AWA decided to return Maxim's key to the organization he co-founded almost 100 years ago. At the ARRL Atlantic Division Convention in May 2008, the museum's former curator, Ed Gable, K2MP, presented the key to Craigie and Atlantic Division Director Bill Edgar, N3LLR. Craigie and Edgar then presented the key to ARRL President Joel Harrison, W5ZN, and ARRL Chief Executive Officer David Sumner, K1ZZ, on Friday, July 18.

"The key will find a prominent place in the League's collection of historical artifacts," Craigie said. "The Old Man's key has come home".

### **NEW 70 CM COORDINATION AGREEMENT REACHED FOR NEW ENGLAND**

In the next step of developing a long-term procedure to mitigate interference to the Air Force PAVE PAWS radar site at Cape Cod Air Force Station in Massachusetts, the ARRL has brokered a deal that will allow new coordinations to be considered by the New England Spectrum Management Council (NESMC) on the 70 cm band.

ARRL Regulatory Information Manager Dan Henderson, N1ND, has been engaged in discussions with Lou Harris, N1UEC, of NESMC; USAF Colonel Chris Gentry, commander of the Cape Cod PAVE PAWS Radar installation, and Dave Pooley of Air Force Space Command Headquarters, to craft additional procedures that would allow NESMC to consider new or modified 70 cm repeater applications.

"The plan being put into place will allow NESMC to resume 70 cm coordination while putting into place some checks and procedures which will allow the Air Force to be notified when a new repeater is going on the air within the area around the radar sites," Henderson said. "NESMC continues as the frequency coordinator for amateur repeaters, which is their role."

The ARRL will work with NESMC on Longley-Rice modeling to obtain an estimated signal strength at the radar of the new repeater. Once this occurs, Henderson said the ARRL will "then make a recommendation -- based on our knowledge of current repeater signals -- if the proposed repeater should be at or near limits that that should allow it to operate without interference to the radar."

Henderson added that this is not an exact science: "Some levels of degradation of the radar receiver levels are only detectable by precise testing. The unit of the Air Force that provides that testing only visits the Cape Cod site about once a year. It is possible

that a repeater that had been in operation for a while under the new procedures would have to address an interference issue when that future testing is performed."

Calling it "fortunate" to have Harris, Pooley and Skinner involved in the process, Henderson said, that if successful, "The procedures being put into place can serve as a model for addressing the same issues in other situations which might arise, such as the mitigation project around the PAVE PAWS site at Beale Air Force Base in California."

Part of the new agreement includes the ARRL serving as the point of contact for the Air Force if new interference is detected. "The ARRL is providing a mechanism whereby and future interference issues can be immediately addressed and hopefully resolved," said Henderson. "It makes sense to have a 'first step' whereby an amateur is given the opportunity to address concerns before a more formal FCC interaction would have to be considered by the Air Force. This plan hopefully provides that step."

The agreement does not inject the ARRL into a formal role in repeater coordination's; the role of the League in the coordination process will be simply to provide the NESMC coordinator with an assessment of the proposed repeater's signal strength, as well as potential for interference at the radar site. "While we do not have the specific receiver sensitivity requirements, Air Force officials have indicated our previous calculations for repeaters already involved are 'in the ball park,'" Henderson stated. "We should be able to provide NESMC with a relatively informed assessment for any new repeater, but the final decision on whether to coordinate a repeater remains in the hands of NESMC."

### **NVARC Club Net**

Topics discussed on the Club net recently; emergency communications preparedness and activities at NMAEPC. Alzheimer's Memory Ride, Road Cleanup, Field Day wrap up and suggestions, WL2K setup problems.

Recent participants include Leo K1LK, Bob W1XP, Larry KB1ESR, Skip K1NKR, Stan KD1LE, Richard W1LTN, Den KD2S.

The net is a good place to bring information for the club and get questions answered. The net meets at 8:00 PM Monday evenings on the 442.900 N1MNX repeater.



## 2008 Flea Markets

### August

9 Rason Hamfest Ledyard CT  
17 NoBARC Adams Ma  
17Flea at MIT  
22-24 NE Division Convention Boxboro

### September

14 W CT Newtown Ct  
20 RI Fall Flea and Auction Forestdale RI

## Advertisements



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

## Contest, DXpeditions and Special Events

The information for a DXpedition can be quite detailed and may include bands, dates, number of stations, and times of day they plan to work certain continents so I can not list it all here. But if a country or prefix is of interest you can get more information at [www.425dxn.org](http://www.425dxn.org).

### Contests 2008

#### OCT 6

Logbook of the World Contest, Ph 0000Z-2359Z  
Oceania DX Contest, Phone 0800Z, to 0800Z, Oct 7  
RSGB 21/28 MHz Contest 0700Z-1900Z, Oct 7

#### 13

Logbook of the World Contest, CW 0000Z-2359Z



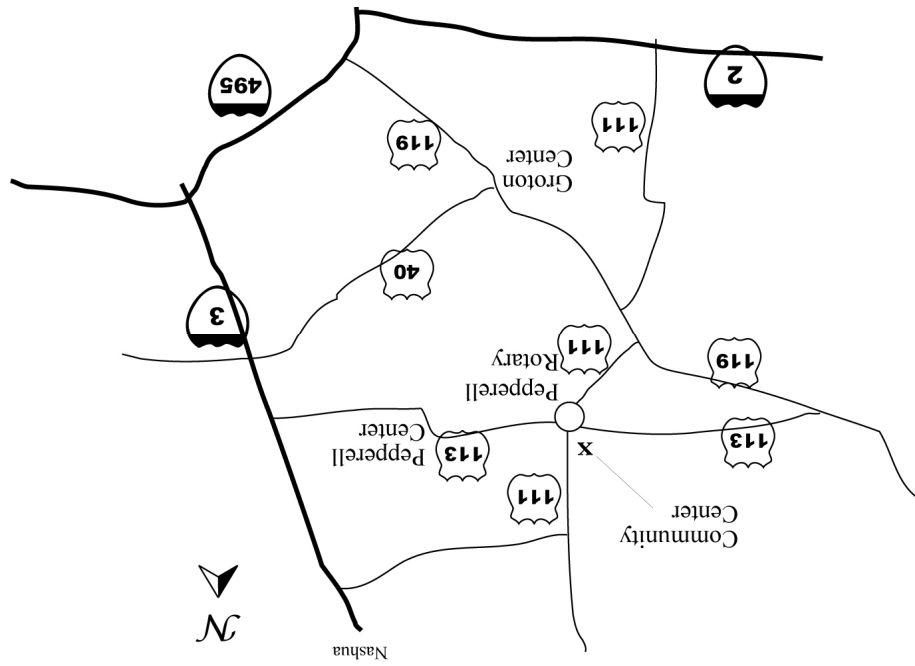
## Nashoba Valley Amateur Radio Club

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<http://www.n1nc.org/>

President: Stan Pozerski KD1LE  
Vice President: Peter Nordberg N1ZRG  
Secretary: John Griswold KK1X  
Treasurer: Ralph Swick KD1SM  
Board Members:  
Joel Magid W1JMM 2006-2009  
Bob Reif: W1XP 2007-2010  
Skip Youngberg K1NKR 2008-2011

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PIO: Dave Peabody N1MNX  
Librarian: Peter Nordberg N1ZRG  
Property Master: John Griswold KK1X  
N1NC Trustee: Bruce Blain K1BG  
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  
147.345 + 100 Hz Repeater  
53.890 - 100Hz Repeater  
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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