



The Minuteman Repeater Association

The Minuteman

Volume 31, Issue 4

March 2002



President's Corner by Kevin Paetzold, K1KWP

Last meeting: On behalf of the MMRA I would like to thank N1KUG and WX1L for speaking at our January meeting. The presentation included information about the two "Disaster Medical Assistance Teams" (DMAT) which are based in Massachusetts and the Military Affiliate Radio System (MARS).

The DMAT teams are part of the National Disaster Medical System (NDMS). These teams are called upon to respond to major disasters. Both of these teams were called to NYC in the aftermath of September 11 attacks. N1KUG is the radio officer for DMAT-MA1 (<http://www.ma1boston.com/>). WX1L is the radio officer for DMAT-MA2 (<http://www.dmatma2.org/index.htm>). The URL for NDMS is <http://www.oep-ndms.dhhs.gov/>. Both DMAT teams and MARS are looking for additional amateur radio participation. If you are interested in these programs you can contact N1KUG or WX1L at the URLs above.

Fox-a-thon: On February 2 the MMRA held an event called the fox-a-thon. This event was intended to provide a venue to demonstrate RDF and foxhunting to anyone interested. We had six guests (including KB1HAD, N1BDA, N1XKB, and N1OIL) paired with five of the regular MMRA foxhunters. Details are available in this newsletter and at <http://www.foxfinder.org/RDF/fox-a-thon.htm>.

March meeting: Right before the press deadline for this newsletter our planned speaker for the March meeting had to postpone his presentation. We expect to be moving one of our other scheduled speakers to fill this slot but details could not be confirmed at the time we went to press. Please check into the weekly Tuesday night net for details (or check your email) when this is confirmed.

MMRA Elections: The May meeting of the MMRA is also known as the *Annual* meeting. At this annual meeting elections for the various club officers will take place. On Feb 20 an MMRA board meeting took place and a nomination committee was asked to form. The nomination committee is made up of N1NOM, KZ1G, and WZ0C. The committee is asked to find candidates for the various offices and director

positions and is asked to develop a nomination slate for presentation to the members. Minutes of the board meeting are available on page 3 of this newsletter.

As I have described in other newsletters there is some quantity of behind the scenes work which is required to keep the MMRA (and its repeaters) viable. Serving as an officer or director of the organization is a way that you can help assure that these repeaters and this system stay on the air (in addition to your membership dues which are always appreciated). If you would like further information, will consider serving, or have someone to nominate for one of these positions, please contact the committee by email to mmra@mmra.org.

The MMRA bylaws and a description of the election procedures and offices are available at <http://www.mmra.org/club/about/bylaws.html>. Please consider attending the upcoming April board meeting to see the behind the scenes activity for yourself.

Volunteers needed for Boston Marathon, April 15: Some changes have occurred in the way that amateur radio operators are being organized for the upcoming Marathon. As a result even if you volunteered in past years you may not be in the database and may not have been contacted. Steve Schwarm, W3EVE, is organizing this years marathon activities. A message from W3EVE is included on page 3 which shows how to contact the BAA and how to volunteer. Steve has informed us there is still a need for more volunteers. If you are able to volunteer for the Marathon please see the message from W3EVE. As I have mentioned many times in the past I think that the Marathon is a excellent way to practice your skills and evaluate your equipment for operation in a field/emergency scenario.

Inside this issue:

<i>MMRA Information</i>	2
<i>Marathon Communications</i>	3
<i>Board Meeting Minutes</i>	3
<i>Repeater Report</i>	4 & 5
<i>Fox Hunting</i>	6
<i>MMRA Updates</i>	6
<i>Public Service</i>	6 & 7
<i>Next Meeting</i>	8

About the Minuteman Repeater Association

The Minuteman Repeater Association (MMRA) is dedicated to Amateur Radio and public service. The MMRA has built a large system of repeaters in Eastern Massachusetts.

The MMRA meets on the 3rd Wednesday of September, November, January, March, and May. Meetings start at 7:30 PM in the Campion Center in Weston MA. Meetings are open to all interested parties. Talk-in is available on the Weston 2-meter repeater (146.82).

The Minuteman newsletter is mailed one week before each meeting. Members are encouraged to submit articles. Articles may be sent to the editor via email to n1be@arrl.net. The deadline for articles is the last Friday of the month preceding the meeting.

Each Tuesday evening at 8PM the MMRA links all the repeaters for an open net. The topic is "Technical Information and Other Stuff". Feel free to join us.

Membership in the MMRA is open to all radio amateurs. Annual dues are \$25 per individual or \$35 per family. The membership year starts on Sept 1st. Dues for new members are prorated for the remainder of the year. See our web-site for details.

Email to the club leadership should be sent to mmra@mmra.org. The MMRA web site is: <http://www.mmra.org/>

An email distribution list for club members has been established on: <http://www.yahogroups.com/> — the name of the group is "MMRA".

Repeater and Frequency Information

Location	MHz	PL	Call	Note
Marlboro	53.810	71.9/173.8	W1BRI	PTL
Marlboro	146.610	146.2	N1BHI	FTL
Quincy	146.670	146.2	W1BRI	PTL
Stoneham	146.715	146.2	N1NVL	PTL
Weston	146.820	146.2	WZ0C	PTL
Hopkinton	223.940	103.5	N1BHI	FTL
Quincy	224.400	103.5	N1KUG	FTL
Weston	224.700	none	N1HBR	FTL
Stoneham	446.725	88.5	N1NVK	NA
Shrewsbury	449.575	88.5	W1BRI	FTL
Marlboro	449.925	88.5	W1MRA	Network Hub

Marlboro	144.390	none	N1QPR-2	APRS Digipeater
Marlboro	145.030	none	W1MRA-3	KA-node Digipeater
?	145.630	146.2	W1MRA	Fox Box

Notes: FTL = Full Time Linked to the Hub.
PTL = Part Time Linked (on demand).
NA = linking is Not Available.

PL: There are two 6 meter receivers with different PL's. PL is required on 2 meters to prevent interference. The code **750** will temporarily disable the PL requirement.

Using the Autopatch: Only the hub has a telephone line.
(1) Link to the hub if necessary.
(2) Then bring up the patch using the 449.925 autopatch codes.

Control codes are sent to members upon receipt of dues.

MMRA Leaders

President	Kevin Paetzold	K1KWP
Vice President	Bob Evans	N1BE
Secretary	Michael Ford	WZ0C
Treasurer	Bill Northup	N1QPR
Clerk	Eddie Mulhern	N1NOM
Technical Officer	Bryan Cerqua	W1BRI
Director	Al Kunian	KA1AL

Director	Wayne Foley	N1XXI
Director	Shelley Northup	N1VJE
Director	Bill Thorpe	WA1NLR
Director	Clark Conti	N1NVK
Emergency Coordinator	Kevin Paetzold	K1KWP
Newsletter Editor	Bob Evans	N1BE
VEC Liaison	Bill Wade	K1IJ
Webmaster	Michael Ford	WZ0C

Amateur Radio Communications at the Boston Marathon by Steve Schwarm, W3EVE

Radio operators are making preparations to support the 106th running of the Boston Athletic Association Boston Marathon on April 15, 2002. Amateur Radio plays a vital part in supporting runners before, during, and after the marathon. This year we have a combined organization handling all phases of radio support; start area, length of the course, and finish line.

Positions are available starting early in the day in Hopkinton, along the route at aid and water stations, and later in the day at finish line operations in Boston. You can choose which activity you will be involved with, or work multiple locations.

In Hopkinton, we will assist with coordinating the multiple parking areas and providing for start line safety. Along the 26 mile route, hams assist the Red Cross at aid stations with supply requirements and ambulance dispatch. Runner pick up busses traveling the route will have hams on board. At the finish line, radio amateurs are working with the medical teams and shadowing officials.

You will need a two meter or dual band HT, extended antenna, and extra batteries for participation. Training sessions and procedure sheets will be available before the event.

We will try to accommodate your needs within the confines of the event set up.

An on line sign up form and more details are available at <http://cpsg.amateur-radio.net/>. You can mail in the BAA volunteer form available at the BAA web site <http://www.baa.org/>. You can find the volunteer form by clicking *106th Boston Marathon* and then click *Volunteering*.

Fill out the application and mail it in as instructed. Be sure to fill in the *Race Day (April 15)* section to specify that you are a Ham Radio volunteer, and to indicate where you prefer to work:

- If you want to work the start check *radio team*.
- If you want to work the finish check *ham radio (finish only)*
- If you want to work the course, write "ham radio (course)" on the blank line with (*specify*) under it.

We will be doing a mailing at the end of February with more details. You will be able to change your mind at that time as well. Feel free to contact me, Steve Schwarm, W3EVE at (508)384-7697, w3eve@arri.net. Please no calls after 9PM or before 8AM.

Board Meeting Minutes by Bob Evans, N1BE

The MMRA Board of Directors met the evening of February 20. Present were K1KWP, N1BE, WZ0C, N1QPR, N1NOM, N1VJE, and W1BRI. Two issues were discussed: the March 23 Simulated Emergency Test (SET) and MMRA elections.

March 23, 2002 SET — The board agreed to dedicate complete use of the MMRA system for the currently unknown needs of the SET. It is desirable to have at least one MMRA control operator participating in case any non-default linking is needed. If there is a fox hunt that same day, the fox hunt will use simplex frequencies instead of our repeaters.

N1NOM, N1QPR, and N1VJE will attend the Feb 23rd SET planning meeting. After that meeting, more details of the MMRA involvement should be known.

MMRA Elections will be held at the May general membership meeting. The following positions need to be filled:

President, Vice President,
Secretary, Treasurer,
Clerk,
2-year director (N1VJE incumbent),
2-year director (N1XXI incumbent),
1-year director (remainder of KA1AL's term)

WZ0C and N1NOM indicated they are not available to serve again as officers. (However as trustees they will retain the privilege to vote at board meetings.) The remainder were willing to serve again but acknowledged the need for some new board members.

In addition, Kevin indicated that he can no longer fulfill the role of MMRA Emergency Coordinator and asked that the Board appoint someone else.

A tentative slate of nominees was gathered from those present:

* President	K1KWP (incumbent)
* Vice President	N1BE (incumbent)
* Secretary	NOMINEE NEEDED
* Treasurer	N1QPR (incumbent)
* Clerk	N1VJE
* 2-year director	NOMINEE NEEDED
* 2-year director	NOMINEE NEEDED
* 1-year director	NOMINEE NEEDED
* Emergency Coordinator	
	VOLUNTEER NEEDED

The Board requests that N1NOM, KZ1G, and WZ0C form a nominating committee to select a nominee for each open position. A complete slate is needed by the April 26 newsletter deadline to provide adequate notification before the May meeting.

Repeater Report by Bryan Cerqua, W1BRI

449.925 Battery: The two 12V batteries used to power the 449.925 transmitter during a power failure were in very bad shape. Andy, N1BHI provided a replacement. With the help of Wayne, N1XXI, the largest battery on the Atlantic battery list was selected and paid for by Andy as a donation to the club. The battery cost around \$130. Andy and I installed the new battery sometime after the holidays. To protect the battery terminals against an accidental short, Andy took out his trusty jack knife and cut an old plastic water bottle into a cover that was tie wrapped to the battery cables.



Custom cover on the new battery



New battery behind the rack

With the new battery in place a test was done with the AC power supply turned off. The 13A load of the transmitter only caused a voltage drop of around 0.2 volts, compared to the voltage with the transmitter off. This battery is the largest and heaviest one that I've ever seen; I could hardly pick it up to place behind the repeater rack. Thanks to Andy for helping lug the thing from my car to the shack.

We don't get many power failures at the site but if we do I'm sure this battery should hold us for a few days. To inform users of a power failure the normal courtesy beep is followed by a CW "BP", indicating that the system is on battery power. This alerts the users that they should not rag chew too much. This will also let the control operators know what the AC power state is without having to drive to the site to find out.

146.610: After the Marlboro flea market I showed Steve, KB1EFS, and his son Jim the Marlboro repeater sites. When I arrived at the site I was amazed to see that all the junk around our shelter was cleaned up by the country club. Most of the trees are gone; just a few that anchor the 6-meter transmitter mast guy cables are left. The shelter looked so strange all by itself. The small swampy river that we used to have to jump over has been filled with gravel, making it much easier to carry stuff in and out of the shelter.

We have permission to assemble a tower to replace the temporary crankup mast. Hopefully the project will start sometime this Spring. We also plan to paint the shelter a nice friendly color instead of the ugly yellow it is now. Spring is just around the corner and we will need some help to complete these tasks. If anyone has some tower guy wire that could be donated for this project, it would great. Also, a donation of hardware for bolting the tower legs together would save the club some expense. We will need to use a gin pole to erect the tower. Does anyone have one we can borrow?

449.575: I visited the repeater room to check the link radio squelch setting because when linking to the Milford repeater I could tell it was tickling the CTCSS decode board, but no audio was heard. I thought the squelch was too tight. To my surprise, each time I closed the repeater case top door, the noise on the link radio would get worse. Trying some simple ex-

(Continued on page 5)



Deteriorated Old Batteries

Andy doesn't mess around when he buys a battery!



Repeater Report (cont.)

(Continued from page 4)

periments I determined that RF inside the repeater case was getting into the link radio. Sliding a sheet of copper clad PC board between the duplexers and the ICOM repeater rack cleaned up the noise quite a bit. Now the Milford repeater can be heard much better and the funny noise when linking to 449.925 disappeared. I plan to build a steel cover that can be screwed down on the ICOM repeater rack with some additional shielding to improve things even more.

Rebuilding the Fox Box: The original transmitter in the fox box finally quit working and it was too much of a kluge to repair. The call went out for a new transmitter and thanks to George, N1EAV, an Icom 2AT was donated to the club. Because the HT was in great shape, no modifications were done to it to interface to the control box. I rebuilt the controller in a smaller package to make room for the 2AT which is much larger than the original transmitter.

The controller is simply a 555 timer running at 1 Hz with a binary counter chip that allows you to select various transmit intervals. All the controller ICs are CMOS to conserve battery power. The original adapter that converts 12V to 8V was drawing about 55ma in standby. This was unacceptable, but replacing the guts of the adapter with a LM317 regulator lowered the standby current to 7ma.

The PTT circuit of the 2AT is fairly tricky. It requires the radio to be powered up about 1 second before activating PTT. I was concerned that leaving the HT powered up all the time in receive mode would reduce the lifetime of the battery. The battery drain with the radio squelched was around 12ma and I did not want to go into the radio to cut the power feed to the receiver. I thought it would be better to keep the radio complete in case we wanted to use the receiver for something like touch-tone commands to the controller.

The controller has toggle switches for power ON/OFF, recording a new message and to enable the internal speaker. The voice message is stored in an inexpensive memo-mate gadget with a maximum storage capacity of 20 seconds. A push button on the controller box can be used to test the system before deployment.

After completing the rebuild the original battery was charged up and tested to see how many days the fox box would run. A dummy load was placed on the antenna jack of the HT so it wouldn't be broadcasting all over the place. I live on a high hill in Milford and didn't lots of strangers with funny looking [fox hunting] antennas to show up in my driveway. To my disappointment the run time was only about 3 days. This is much less than calculated. I recharged the battery and repeated the test with the same results. I measured that the battery voltage would drop to 8 volts in a few days indicating that some of the cells are bad.

Lucky the normal Saturday morning foxhunters were down my way and I met them for breakfast. John, N1OWA, also joined us. I had taken my digital camera with me to show the guys the progress on the fox box. I mentioned that I needed a new 12V 17 Amp-Hour battery. John said he had one left over from the days when we got some batteries at the Taunton repeater site. I stopped by John's on the way home after breakfast and got the



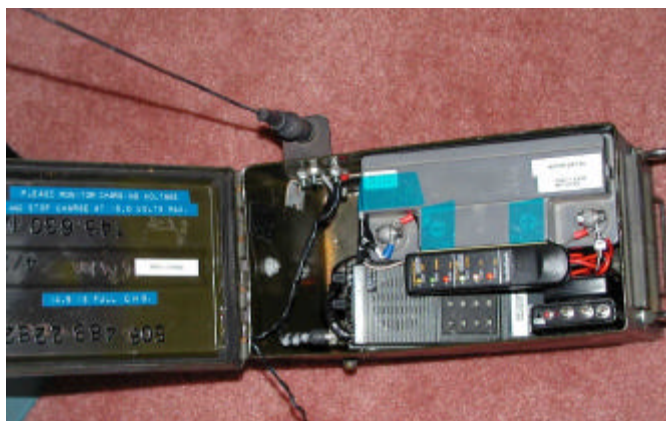
On the left: the MMRA Fox Box.

Below: controller box and external speaker.



new battery. After the new battery was installed it ran for about a week when tested.

For a final touch a Radio Shack LED automotive battery tester was added with a switch to indicate the state of charge. The fox box has a built in battery charger that is an 800ma wall transformer wired through a fuse and diode to prevent any backward draw into the wall transformer when not plugged in. It takes about 24 hours to charge a fully discharged battery. The fox box was returned to Mike, WZ0C, for re-deployment at the December club meeting.



Inside the box it's mostly battery.

Fox-a-thon! by Bill Northup, N1QPR

The Feb 2 hunt was a special event to introduce foxhunting and RDF techniques to our friends. We had six vehicles with a total of 13 hunters. We all met in Weston at the Campion Center. We got to know each other, and all of the regular hunters showed the gear that they use. Kevin also brought a "Box of Joe" and donut holes.

We took a group picture in Weston while drinking coffee, as well as one of Eddie and Roger having a cane fight. Another of Mike setting up his doppler antennas, and one of Steve, Bob and Mike together in front of my truck. All

the pictures of this event can be seen on a web site I set up at: <http://www.foxfinder.org/> I also post the weekly fox hunt maps that Larry, W1DYJ generates.

The fox for this event was Clark, N1NVK who was hidden just off of Rt. 9 in Southborough. The fox location was N42° 17.40', W 71° 31.75'; As usual we had 4 home bearings. The bearings were close but the resulting rectangle was rather large. The fox was just to the West of the rectangle, and all of the hunters had started from far to the East in Weston.

Clark was found by:

Mike, WZ0C, and Sandy, KB1HAD;
Bill, N1QPR, Shelley, N1VJE, Patti,
and Matthew;

Bob, N1BE, and Steve, N1BDA;
Kevin, K1KWP, and Roger, N1XKB;
Eddie, N1NOM, and Paul, N1OIL;
and Dick, K1KMN.

Fox box report:

The fox box was deployed in Weston the day of the Fox-a-thon.. Mike has not had time for hiding it since then. If someone else would like a turn hiding the box we can make it available.

MMRA Updates

Digipeater repairs — Bill, N1QPR has been busy repairing and reprogramming the MMRA-3 digipeater. Eddie has graciously provided a KPC-3 TNC for this project. When it returns to service, the digipeater will use the W1MRA callsign, and like other stations on 145.03 it will be a KA-node.

Club Callsign on 449.925 — Walter, N1HBR, was agreeable to the use of the club callsign on the flagship hub repeater. The controller has been reprogrammed. You now hear **W1MRA** instead of Walter's call on 449.925.

March 23rd SET Planning

N1NOM, N1QPR, and N1VJE attended the SET planning meeting at the MEMA bunker in Framingham on Feb 23. The SET is focused on message passing and using the NTS message format. Participants will open envelopes at specific times to stimulate messages. They are also encouraged to improvise.

There will be two main sets of frequencies in use: one for RACES, and one for ARES, Skywarn, and others. We have been requested to link up the entire MMRA system and have it available for command and control messages. RACES also wants an MMRA control operator to be available in case of need.

For more details, contact N1NOM or N1QPR.

Public Service

The season for public service is upon us. Hams are a vital part of many of these events. Without our volunteer efforts the served organization would face prohibitive costs to set up a communication infrastructure.

To the radio operator, public service is a chance to hone communication skills. These skills are important in an emergency situation. Another benefit to the operator is proximity to the action at the event. For example a ham providing communication to the Boston Marathon might be stationed at the

starting line, finish line, or be providing communication from a vehicle that is patrolling part of the race course.

Public service is one of the few ways we justify the frequencies that have been set aside for Amateur Radio. Working an event can be challenging and fun; you certainly will learn from the experience. So dig out your portable radio, make sure your batteries will last for at least several hours of operating, and volunteer for an event!

For a place to start, check the web sites listed below.

Web sites listing local public service events

Ralph, KD1SM, and Stan, KD1LE maintain an up-to-date list of "Public Service Volunteer Opportunities in the New England Division". This material is distributed in several ways, including a reprint of the list on the next page of this newsletter. With the frequent changes to the list at this time of the year, it's best to go directly to the web page where Ralph and Stan maintain the list:

<http://purl.org/hamradio/publicservice/nediv>

The **Crocker Public Service Group** is an association of amateur radio operators in Eastern and Central Massachusetts dedicated to providing people, training, and other resources for public service events. In addition to listing upcoming events, their web site, <http://cpsg.amateur-radio.net/> has good information on issues like Suggested Equipment for Public Service Events and Hints for operating at Public Service Events. CPSG is leading the effort to provide communications at the Boston Marathon and at the Walk For Hunger.

Public Service Volunteer Opportunities in the New England Division

Listing public events at which Amateur Radio communications is providing a public service and for which additional volunteers from the Amateur Community are needed and welcome. Please contact the person listed to identify how you may serve and what equipment you may need to bring. **Every event listed is looking for communications volunteers.**

Date	Location	Event	Contact	Tel/Email
Apr 15	Hopkington to Boston	MA Boston Marathon	Steve W3EVE	508-384-7697 w3eve@arrl.net
Apr 21	Boston	MA Multiple Sclerosis walk	Bob WA1IDA	508-650-9440 walida@arrl.net
Apr 28	Groton	MA Groton Road Race	Erik KA1RV	978-448-5536 erik@eggo.org
Apr 28	Boston	MA March of Dimes WalkAmerica	Bruce KC1US	781-275-3740 kclus@net1plus.com
May 5	Boston	MA walk for Hunger	Bob K1IW	413-647-3060 w4h@amateur-radio.net
Jun 1	Narragansett	RI ADA Ocean State 150	Bruce KC1US	781-275-3740 kclus@net1plus.com
Jun 2	N Kingstown	RI ADA Ocean State 150	Bruce KC1US	781-275-3740 kclus@net1plus.com
Jul 28	Marlboro to Amherst	MA MSPCC Yankee Tour	Bruce KC1US	781-275-3740 kclus@net1plus.com
Jul 29	Amherst to N. Adams	MA MSPCC Yankee Tour	Bruce KC1US	781-275-3740 kclus@net1plus.com
Jul 30	N. Adams to Castleton	MA MSPCC Yankee Tour	Bruce KC1US	781-275-3740 kclus@net1plus.com
Jul 31	Castleton to Brimington	VT MSPCC Yankee Tour	Bruce KC1US	781-275-3740 kclus@net1plus.com
Aug 1	Burlington to Killington	VT MSPCC Yankee Tour	Bruce KC1US	781-275-3740 kclus@net1plus.com
Aug 2	Killington to Keene	VT MSPCC Yankee Tour	Bruce KC1US	781-275-3740 kclus@net1plus.com
Aug 3	Keene to Marlboro	NH MSPCC Yankee Tour	Bruce KC1US	781-275-3740 kclus@net1plus.com

This list is published periodically as demand warrants by Stan KD1LE and Ralph KD1SM. Our usual distribution is via packet to NEBBS, via Internet mail to the arrl-nediv-list and ema-arrl distribution lists, and on the World Wide Web. If other mailing list owners wish us to distribute via their lists we will be happy to oblige. Permission is herewith granted to republish this list in its entirety provided credit is given to the authors and the URL below is included. Send comments, corrections, and updates to:

(via packet) KD1SM@K1UGM.#EMA.MA.USA,
(via Internet) KD1SM@ARRL.NET.

We make an attempt to confirm entries with the coordinator unless the information is from another published source. We very much appreciate the assistance we have been receiving from our 'scouts'; everyone is welcome to send us postings.

World Wide Web users: the most recent copy of this list is maintained as <http://purl.org/hamradio/publicservice/nediv>.

Walk for Hunger — Sunday May 5 by Bruce Pigott, KC1US

Amateur Radio operators will play a key roll in this event organized by Project Bread to feed hungry people in Massachusetts. Eighty operators are needed to provide safety and course communications supporting more than 45,000 walkers. We will be using 2 meter HTs and mobiles for a 20 mile route from Boston out to Newton and back.

Positions are available at different hours and locations throughout the morning and afternoon. Coordinator shadows, operators at checkpoints, mobile van communicators and walking marshall shadows are all needed. We will be having the special event call of W4H again this year for net control. This walk, which is the largest in the nation, raises funds for

nearly 400 food banks, shelters, and community pantries in 129 communities throughout Massachusetts. More information about the Walk for Hunger itself or feeding programs, can be found at <http://www.projectbread.org/>

To sign up on line go to <http://cpsg.amateur-radio.net/> or send an email message to kc1us@nsradio.org You can call me for more information at 781-275-3740 after 7:30PM, or days at 781-937-1076.

Information about the Crocker Public Service Group, and more events we provide support for, is available at <http://cpsg.amateur-radio.net/>

Next Meeting — Wednesday Mar. 20, 2002

To Be Determined: Speaker not confirmed at press time.

Calendar of Ham Radio Events

Mar 10: Amherst Mt. Tom ARA Flea
Mar 20: **MMRA meeting**
Mar 23: MA Simulated Emergency Test
Mar 24: Framingham FARA Flea
Apr 15: Boston Marathon
Apr 17: **MMRA Board meeting**
Apr 21: Cambridge Flea at MIT
Apr 26: **MMRA Newsletter Deadline**
May 3-4: HossTraders Flea Hopkinton NH
May 4-5: New England QSO Party
May 5: Walk For Hunger
May 15: **MMRA meeting**
May 19: Cambridge Flea at MIT
Aug 23: **MMRA Newsletter Deadline**
Aug 24-25: Boxboro ARRL Convention
Sep 18: **MMRA meeting**
Nov 2: Simulated Emergency Test

(Flea market info from W1GSL list. <http://mit.edu/w1gsl/Public/ne-fleas>)



MMRA VE Sessions

3rd Saturday of each Month

9 AM at the Marlboro Public Library

Contact: Bill Wade, K1IJ

781-891-9079 Evenings 6 to 10 PM,

Weekends 8 AM to 10 PM.

Accredited by the ARRL VEC

THE MINUTEMAN REPEATER ASSOCIATION

MMRA
P.O. Box 669
Stow, MA. 01775-0669

Email: mmra@mmra.org



WE'RE ON THE WEB!
[HTTP://WWW.MMRA.ORG/](http://WWW.MMRA.ORG/)
