The Minuteman Repeater Association

The Minuteman

Volume 33, Number 3 January 2004

President's Corner by Kevin Paetzold, K1KWP

When you read this it will be after the holidays. Nonetheless I hope that everyone had a good holiday season!

Last Meeting: The MMRA had a general membership meeting on November 19 at the Framingham facility of the Massachusetts Emergency Management Agency (MEMA). There was more attendance than most recent meetings, apparently due to the interesting venue. After club business was conducted, primarily the approval of the purchase of a new SCOM 7K controller for $500, we were taken on a very interesting tour of the facility by Tom Muise, W1CDA.

Also in November, Tom, W1CDA, donated a solid state UHF Motorola Micor repeater to the MMRA. Bryan, W1BRI, has already proposed to place this new repeater in service on 449.925. Planning for that project is underway.

I would like to take this opportunity on behalf of the MMRA to thank Tom both for making the MEMA tour possible and for donating the UHF repeater!

Echolink: During the past few months, the MMRA has been conducting tests with Echolink connected to the hub. This connection was being hosted by N1QPR at his QTH. We suspected the path from the N1QPR QTH to 449.925 was not the best and these tests confirmed those suspicions. A new Echolink node was put together by W1BRI and it is now being hosted by K1IW at his QTH. See the repeater report for more details and pictures. On behalf of the MMRA I would like to thank N1QPR, W1BRI and K1IW for making this all possible. The MMRA Echolink node is listed under the club call sign, W1MRA.

At this time we are unable to allow the initiation of outgoing connections via Echolink because the node numbers conflict with various DTMF repeater control codes. As part of a major controller/firmware project that K1IW has undertaken we do plan to eventually be able to allow initiation of outgoing connections via a prefix code which will be given to all members.

Because our Echolink node is now more permanent and functional it is expected that stations or repeaters which are not reachable via the MMRA network will now be able to reliably connect and participate in nets which are held on the MMRA repeaters such as the Tuesday night 8PM TIAOS net, the monthly ARES net, and the CEMARC youth net (when that starts back up). It would be great to hear those members who have moved away connect back into the repeaters. Also it should be possible for the ARES net controls to take advantage of this to link in other areas of the EMA section that are not currently able to participate in the monthly ARES net.

When in a QSO with an Echolink station or repeater please remember to leave long, multi-second, pauses in between transmissions.

Repeater Controllers/Firmware Project: The new SCOM 7K controller, approved by the members at the last meeting, will serve two purposes. First it will be used by K1IW to develop, test and debug a major upgrade to the controller programming for the whole network . Eventually the extra 7K will be used as the controller for the 147.270 repeater. Details of this project are available elsewhere in this newsletter and I expect more will be in upcoming issues.

Next Meeting: On January 21 the MMRA will hold a general membership meeting at 7:30PM at the Pizzeria Uno in Newton. The topic will be foxhunting. As always, anyone who is interested is welcome to attend. More details are on the back page of this newsletter and on the MMRA website.

Foxhunting: After a short hiatus the MMRA Saturday 10AM 146.010Mhz foxhunts have resumed. You can see reports from recent foxhunts by following links on the MMRA web site. Also described on the website, there is a new MMRA email list called "foxhunts" where announcements and results of recent foxhunts can be found.

Future meetings: We are looking for speakers and venues for the March 17 and May 19 meetings. Members have expressed interest in Software Defined Radio and in an overview of the digital modes (RTTY, PSK-31, etc., and explanation of the tradeoffs, equipment needed, software needed, etc., for each.)

If you would be able to give a talk on either of the above topics, if you know of a speaker, or if you have a suggestion for another topic, hopefully including the name of a speaker, please let us know by email to mmra@mmra.org or on the Tuesday night net.

I hope that everyone has a happy New Year.

Inside this issue:

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 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.

The MMRA meets on the 3rd Wednesday of September, November, January, March, and May. Meeting time, locations and talk-in frequency vary. These are announced in the newsletter and on weekly nets. Meetings are open to all interested parties.

Each Tuesday evening at 8PM the MMRA links most of 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. See our website 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.yahoogroups.com/

— the name of the group is "MMRA".

Repeater and Frequency Information

Location	MHz	PL	Call	Note
Marlboro	53.810	71.9	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	N1BE	PTL
Brookline	146.985	88.5	W1FCC	Affiliated, PTL
Marlboro	147.270	146.2	W1MRA	PTL (to 10 Meters)
Hopkinton	223.940	103.5	N1BHI	FTL
Quincy	224.400	103.5	N1KUG	FTL
Weston	224.700	103.5	N1HBR	FTL
Stoneham	446.725	88.5	N1NVK	NA
Brookline	447.875	88.5	K1IW	Affiliated, PTL
Shrewsbury	449.575	88.5	W1BRI	FTL
Marlboro	449.925	88.5	W1MRA	Network Hub
Marlboro	144.390	none	N1QPR-2	APRS Digipeater
?	145.630	146.2	W1MRA	Fox Box
Internet	Echolink node 94940 connects to the Network Hub			

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

PL: PL is now 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	Steve Telsey	N1BDA
Secretary	Bob DeMattia	K1IW
Treasurer	Bill Northup	N1QPR
Clerk	Jon Titus	KZ1G
Technical Officer	Bryan Cerqua	W1BRI
Director	Larry Banks	W1DYJ
Director	Shelley Northup	N1VJE
Director	Steve Schwarm	W3EVE
Director	Bill Thorpe	WA1NLR
Emergency Coordinator	Bill Northup	N1QPR
Public Service Coordinator	Kevin Paetzold	K1KWP
Newsletter Editor	Bob Evans	N1BE
VEC Liaison	Bill Wade	K1IJ
Web Page Editor	Bob DeMattia	K1IW

MMRA Board Minutes by Jon Titus, KZ1G, MMRA Clerk

The MMRA Board held a business meeting on December 17, 2003, at "Southborough House of Pizza," Southborough, MA. Attendees included K1KWP, K1IW, N1QPR, KZ1G, W1BRI, WA1NLR, W3EVE and N1BE.

Club President, Kevin Paetzold, K1KWP, opened the meeting at 7:00 PM, with an announcement that he is trying to get the Federal Emergency Management Administration, FEMA, to provide a tour of its Maynard facilities for the March 2004 membership meeting. Kevin lacks a formal commitment now, but will continue to pursue local contacts. *[Construction at FEMA precludes a visit in March — Ed.]*

Treasurer, Bill Northrup, N1QPR, provided an oral report that shows the club finances remain stable, and the club should reach its financial goals for the current fiscal year. Bill noted expenses remain pretty much in line with budgeted amounts. Savings have come from holding fewer meetings at the Campion Center, and from sending members their newsletters via email instead of paying for printing and postage of paper copies.

N1QPR also commented that the 145.03 MHz KA-Node has been permanently decommissioned. 145.03 was not getting any significant use and there were problems with the arrangement for sharing an antenna with the APRS digipeater.

Brian Cerqua, W1BRI, the MMRA Technical Officer described possible uses for a UHF repeater donated to the MMRA. Brian figures the club should use the new repeater to replace the 449.925 machine, but the MMRA must buy new crystals, and may need to buy a new duplexer for the repeater.

Brian and Bob DeMattia, K1IW, club secretary described the upgrades to the MMRA's Echolink connection, via W1BRI's equipment installed at K1IW's home station. Brian wants to keep the Echolink active, but reminded the board of some logistical issues.

Discussion turned to future use of the repeater controllers. Changes to allow controlling two repeaters with a single SCOM 7K were discussed. This involves using phone patch audio out for one radio connection. It will allow standardizing our controller programming, offering more features like initiating Echolink connections, and potential sale of excess 5K and RC850 controllers.

Director Bill Thorpe, WA1NLR, volunteered to contact local newly licensed hams listed on the regular reports provided by the ARRL. Bill will send each of these new hams a brief letter informing him of the club's interests, repeaters, activities, and information on the MMRA Web site. The board decided to keep the message simple and direct and to request an email address, in return for which, the contacted ham would receive free MMRA email newsletters for the remainder of the current fiscal year.

Kevin, K1KWP, got committment of speakers for the January meeting. If you need a Mapquest map, use the address, 275 Washington St., Newton Corner, MA 02458.

The board moved unanimously to transfer the trusteeship of the 146.820 (Weston, MA) repeater from WZ0C to Bob Evans, N1BE.

The board decided to review at its February 2004 meeting the status of repeater trustees who have not renewed their MMRA membership.

The board discussed several revisions to the MMRA Bylaws to increase the threshold for the amount on an expenditure the board of directors can authorize on its own, and to change the requirements for voting on purchases above that limit. Other proposed changes include pro-rating of membership dues for a member's first year, and a definition of membership requirements for members of the board of directors, trustees, and appointees. The board will provide the proposed changes in writing, so the members can vote on them at a future meeting.

In Brief

Stoneham: W1DYJ submitted a clipping from the Dec 18 Boston Globe that indicates the large commercial development which threatens our Stoneham repeater site has been delayed. The state environmental affairs secretary is concerned about traffic patterns and impact to historic parkways and open spaces.

New Hampshire: K1RJZ has been involved in a project deploying used 6-meter radios in central New Hampshire. Details are on the CNHARC web site, http://www.cnharc.org/ and in their December newsletter, at http://www.cnharc.org/communicator/PDF/Dec2003.zip

Framingham: WA1R reports the death of Julie Hoffer, W1DL. Many local hams knew Julie as a vendor at local flea markets.

On the WWW:

K1IW has set up a web site for identifying repeaters and broadcast transmitters near any US location. Surf to http://amateur-radio.net/ and follow the link to "ARN Repeater Websearch".

The SouthEast Iowa Technical Society was an active group running an open system of linked repeaters. Check out their interesting technical articles on the repeater page of the SEITS web site, http://www.seits.org/ .

Repeater Report — by Bryan Cerqua, W1BRI

MMRA EchoLink System: For several months Bill, N1QPR had hosted the MMRA EchoLink station. This was a temporary experiment since the UHF path between Bill's QTH and the hub site is poor. Bob, K1IW offered to host the EchoLink station at his Northboro QTH, with good Internet access and a better RF path. So I decided to build up the station using my hardware including an original WB2REM interface that I purchased from Chuck, KA1MWP when starting to play with EchoLink.

I upgraded the Milford Echolink system to the ULI WB2REM interface thus making my old interface available for MMRA use. Roger, a co-worker, donated a PC. This PC has a large tower case with plenty of room to mount the EchoLink interface and radio inside. The PC was reconfigured, replacing SCSI disks and Linux with IDE disks and Windows 98.

WB2REM interface

The radio is a Motorola HT 220 I had with crystals for 449.925 and 88.5 PL tone reed already installed. After wiring up the HT, I was disappointed to find that the PTT switch was actually an RF switch that connected the antenna port to either the receiver or the transmitter. This was most inconvenient and the only solution was to rip out the switch and replace it with a mini dip relay. Installing this relay was a pretty good challenge. The relay is setup so grounding one side of the relay coil would place the radio in transmit mode.

I used the bottom part of enclosures from broken CD ROM drives to make trays for supporting the HT and interface. A plastic drive bay panel provides both a mounting point for the control switches and a central tie point for all the wires. During the first December big snow storm, the entire system was wired up. Testing with a dummy load, it all worked the first time.

HT & Interface mounted inside PC

The next night I could not get the system working. All I did was clean up some of the wire routing. For some reason the COM2 port was not working. Convinced I zapped the COM port somehow, I shut off everything in disgust. The next day I could not find a COM port card at Staples. That night I fired up the PC and now it was working again, all that was different was the fact the PC was laying on it's side. With Radio Shack LED trouble shooting devices on the COM port I could watch the LEDs while pushing on the PC motherboard. Every time I pressed on the motherboard it would work and stop working when not pressing on the motherboard. Figuring it must be a cold solder joint on one of the surface mount ICs for the COM ports, I placed the PC on my bench and looked at the motherboard under a big magnifying glass. All the IC pins looked fine. If I tried to re-solder the pins I probably would

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Repeater Report (cont.)

(Continued from page 4)

just make things worse. By chance, I noticed the video card metal bracket was just nicking the two header pins that are used to configure the serial ports. I moved the video card to another PCI slot and low and behold the problem was solved. This explains why it worked when pressing on the motherboard since that was preventing the header pins from contacting with the metal bracket on the video card. It's always something like this to keep you on your toes.

Excited about it working, I labeled it and took some photos to show the finished product to Roger at work . He commented that the P-Touch labels looked pretty crummy and suggested that I use Microsoft Word to make up a nice front panel label. At Staples I found some 8.5x11 inch stick-on labels you can use in a printer. I was surprised how easy this is. The result is shown in the photo. I'll keep this technique in mind for future projects.

Front panel label created with Microsoft Word

Testing on the air for a few days, I noticed the system would get stuck in transmit mode. The relay coil was designed for 5V; I had been running it on 12V. I added a resistor in series with the coil and a snubber diode across the relay coil to catch the fly-back voltage. To ease future servicing, I cut the power, audio and control wires and inserted some plugs to make the HT removable in just a few seconds.

The system was tested for about a week before bringing it to Bob's house the following Tuesday for final installation. Bob had a 13 element beam in his basement and it was not hearing 449.925 full quieting. We ended up just relocating the beam to the other side of the basement and this did the trick.

Shortly after setting the PC IP address and configuring the required port forwarding we had the system working on the air in time for the Tuesday night net. A few hams actually fired up their PC and checked into the net via Echolink. Hopefully it will continue working and provide a useful addition to the suite of MMRA capabilities. This system is not setup for making outgoing connections until we coordinate the DTMF commands with the Scom 7K controller that's on 449.925.

449.925: We've received a fully solid state Motorola Micor repeater for replacing what's now being used on 449.925. Prior to this I had acquired two Micor tube type PA stations that I was going to use but you know I hate things with tubes in them, (like 53.81). Shortly I'll get the channel elements setup with crystals for 449.925. The rack that this new station is in is too tall to fit in the current shelter. I have an open frame rack that should work out just fine for re-mounting the repeater. We will also be looking to either repair the duplexer presently on 925 or possibly replace it with a better duplexer.

147.27: I've suspected that something was off frequency on the 147.27/10-Meter link system. One cold day the 10 meter link sounded very off frequency. I went to the site and discovered that the GE channel elements were not the correct type. On GE equipment it's important to have at least one temperature compensated channel element module. One compensated module can be used with a non-compensated element. Both channel elements were the EC type with no temperature compensation. I pulled both the TX and RX elements out. I removed the crystal from one of the EC ICOM modules and replaced it with a 5C compensated type. The next day I went back to the .27 site with the IFR and adjusted both ICOMs smack on frequency. This should take care of any temperature drift problems. So far the system sounds very good when linked to 10 meters.

146.61 & 53.81: Roger, WA1NVC and I visited 146.61 one Saturday to investigate a feedback problem heard on the previous Tuesday night net. We had just left the Waltham Prospect Hill site where a crew was installing a new 900MHz ham repeater.

Once at the .61/.81 site I noticed that I big tree had fallen onto the guy cables that support the 53.81 crank up mast. This was a pretty bad situation since the guy cables were pulled hard with the weight of the tree. Left this way, it would surely not be a good thing. I called my buddy DJ, N1LMI in Marlboro to borrow a ladder and a chain saw. Minutes later I met DJ at his house and got the ladder and electric chain saw. In the meantime I contacted Kevin, K1KWP and he was also on his way with a gas powered chain saw just in case the electric one was not powerful enough. After a few cuts the tree was free from the guy cables. It took some yanking but within about a half hour Roger and I cleared the tree away.

For the feedback problem with the .61 link radio I just gave it a couple of good smacks and maybe this fixed it. The tree leaning on the guy cables caused one of the cables to be come in contact with the link antenna, maybe this was feeding too much RF from the 53.81 transmitter into the link radio, who knows what the real problem was but it was gone after we left the site, hopefully this will not re-occur.

MMRA Repeater Changes — by Bob DeMattia, K1IW

Over the next few months, most of the MMRA repeater controller software is being updated. The update will change the way some of the user commands work. As each repeater is updated, the changes will be announced by e-mail, on the MMRA website, and on the Tuesday MMRA net.

The SCOM 7K controller approved by the club in November arrived in early December. New programming is being developed on the K1IW workbench. Once it is checked out, the current 7K controller at Weston will be replaced by the new one (with the new programming). This allows all the detail work to be done where plenty of test equipment and creature comfort is available. At the repeater site, the controllers are simply swapped and a few wiring changes are made.

The controller that is removed from service will then get its own software upgrade, and it will replace the next 7K controller. This method will be used to update Weston, Stoneham, Quincy, and Marlborough East. When all the existing 7Ks are complete, the RC-850 which operates 147.270 will be replaced.

At Weston, the 5K controller which is currently running the 224.70 repeater will be removed, and the new 7K controller will operate both repeaters and the link. The two most obvious changes that members will see are:

- 224.70 will now have a voice ID and voice response,
- Command codes for enabling the Weston link will change.

This should happen in mid to late January. The other three sites will follow over the next few months.

When these updates are complete, all five MMRA 2M repeaters will be running identical control logic. This is different from what we have now, where the linking arrangements are slightly different from site to site. Also, the three 5K controllers at Weston, Stoneham, and Quincy will be freed up for other uses. One plan is to use one of these controllers to do a rolling update of the Hopkinton and Shrewsbury repeaters, the same way the 7K sites are being done now.

Members that wish to have the new link codes (when they are available), should send their request to K1IW.

SCOM 7K controller on the K1IW workbench. The large panel breaks out important signals like COR-in and PTT-out. The tone pad enters commands into the controller. The speaker monitors the audio path. The switch in the center turns on COR inputs.

From the Last MMRA Meeting, a Visit to MEMA

Above left, the MMRA meeting in the MEMA "war room".
Above right, our host, W1CDA addressing the group

Below is the main communications station. Amateur radio operating positions are in the background behind the MMRA members who are standing.

Above, the Amateur Radio operating positions with computer, TNC, and radios for HF, VHF, and UHF.

Next Meeting — Wednesday January 21, 2004
N1BE & N1QPR: Radio Direction Finding

The MMRA will meet at the Pizzeria Uno Chicago Grill, 287 Washington Street, Newton Corner, MA 02458. This is across from the Sheraton, in the Reed Business Information Building. Directions and maps are on the http://www.mmra.org/ website. The circle around the Sheraton Hotel is a pain, but after rush hour, it shouldn't be too tough to figure out. (The map from the Uno's Web site is NOT good. The Mapquest map is better, but it puts Uno's about 100 M East of its real location.)

N1QPR, and N1BE (with comments from others) will give a presentation on foxhunting. The MMRA has given foxhunting presentations to other local clubs but none has recently been presented to the MMRA itself.

The meeting will start at 7:30PM. A meeting room has been reserved for the MMRA. (Another party will be using Uno's meeting room until 7:00PM.) **Talk-in is on the 146.820 repeater**.

Calendar of Ham Radio Events

Jan 17:	Antique Radio flea, Nashua NH
Jan 21:	**MMRA meeting at Newton Uno's**
Feb 14:	Algonquin Flea, Marlborough MA (Talk-in on MMRA repeaters)
Feb 18:	**MMRA board meeting**
Feb 27:	**MMRA Newsletter Deadline**
Mar 17:	**MMRA meeting at ?**
Mar 20:	ECARC Flea. Pomfret CT
Apr 17:	Antique Radio flea, Nashua NH
Apr 18:	Flea at MIT, Cambridge MA
Apr 21:	**MMRA board meeting**
Apr 30:	**MMRA Newsletter Deadline**

(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!
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