The Minuteman Repeater Association

The Minuteman

Volume 30, Issue 5 May 2001

Board Meeting Minutes by Eddie Mulhern, N1NOM

The MMRA board of directors met at 7:30 PM on April 25th at Stratus Technologies in Maynard. Attending were K1KWP, W1BRI, N1XXI, N1BE, WZ0C, N1NOM, KZ1G, N1NVK, N1VJE, and N1QPR.

Treasurer Bill, N1QPR, discussed the need to increase income to stay solvent. We have enough in the bank for one year. Bill also mentioned that the town of Concord should know by July or August if they have money in the budget to accommodate moving an MMRA repeater there.

Technical Officer Bryan, W1BRI, is looking into ways to solve the interference problem to our 449.925 MHz repeater from an uncoordinated repeater system. He has contacted the owner of that repeater. Bryan discussed needed antenna work and an interference problem at 146.61. The board approved adding PL to the Weston 224.700 repeater.

Newsletter editor Bob, N1BE, was congratulated for the great job he has done with the newsletter. Bob reminded all of the next deadline for articles on 4/27.

Webmaster Mike, WZ0C, was congratulated for the wonderful job he has done on the MMRA web site. He will continue to update and improve the web site.

President Clark, N1NVK, sees energy in the new group at the head of the MMRA and hopes the organization will continue to improve.

Vice President Kevin, K1KWP, mentioned the speaker for the May 16th meeting has not been confirmed but we are hopeful he will make it. Kevin was presented the "Magellan Award" for taking the long way around during a recent fox hunt.

Nominees for election to MMRA offices were discussed. In addition to officers, there are two board of director positions to be filled. The proposed slate is:

President:	K1KWP
Vice President:	N1BE
Treasurer:	N1QPR
Secretary:	WZ0C
Clerk:	N1NOM
Technical Officer:	W1BRI
Director:	W1BRI
Director:	KA1AL
Director:	WA1NLR

A final slate will be presented at the May meeting.

As outgoing president, N1NVK will automatically have a seat on the board for one year. N1XXI and N1VJE have one more year in their terms as directors.

The board discussed bylaw changes that would give votes on the board to trustees and the technical officer. These must be approved by the general membership.

It was decided to try selling some excess equipment on Ebay. A discussion was also held on how to support ARES in their goal to provide linked repeater coverage for all of the Eastern MA ARRL section.

The date of June 20th was set for the next board meeting. The meeting was adjourned at 10 PM.

Bylaw Changes by Clark Conti, N1NVK

At the April Board of Directors meeting, we had a discussion over voting rights of trustees. Kevin took out a copy of the By-Laws and we discovered something unusual. There is NO MENTION of a repeater trustee, and therefore the trustees have no vote on the board, unless they are board members. This seems foolish to me, that the people whose licenses and callsigns are associated with MMRA repeaters do not have legal voices in the operation of the repeaters.

The proposed bylaw changes correct this, as well as officially establish the position of "Technical Officer" which is the job Bryan, W1BRI has been doing so well. Changes to the bylaws must be voted on by the general membership so this will be conducted at the May meeting along with the election of officers.

*"**Proposition 2001.01:** No person shall have more than one vote on any issue governed by the board of directors, regardless of multiple offices or trusteeships held by the individual."*

(Continued on page 3)

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 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 website for details.

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

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	71.9/173.8	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	KA1AL	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
Marlboro	449.575	88.5	N1NVL	NA
Marlboro	449.925	88.5	N1HBR	Network Hub

Marlboro	144.390	none	N1QPR-2	APRS Digipeater
Marlboro	145.030	none	KA1OUI-3	Net/ROM Digipeater
?	145.630	146.2	W1BRI	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.

Control codes are sent to members upon receipt of dues.

MMRA Leaders

President	Clark Conti	N1NVK
Vice President	Kevin Paetzold	K1KWP
Secretary	Bill Thorpe	WA1NLR
Treasurer	Bill Northup	N1QPR
Clerk	Eddie Mulhern	N1NOM
Director	Al Kunian	KA1AL
Director	Brian Cerqua	W1BRI

Director	Wayne Foley	N1XXI
Director	Shelley Northup	N1VJE
Emergency Coordinator	Kevin Paetzold	K1KWP
Technical Director	Bryan Cerqua	W1BRI
Newsletter Editor	Bob Evans	N1BE
VEC Liaison	Bill Wade	K1IJ
Webmaster	Michael Ford	WZ0C

Bylaw Changes (cont.)

(Continued from page 1)

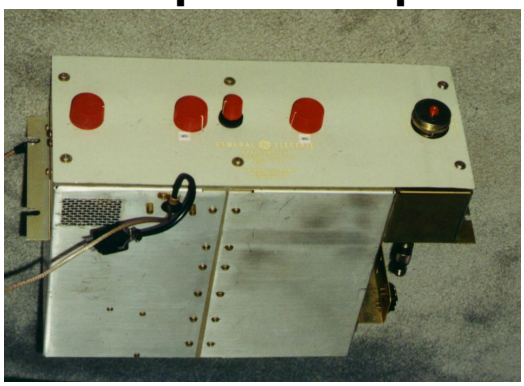
This may seem silly, but we don't want to accidentally give someone multiple votes if he holds an office and is also a trustee. This rule must be in place before we get to the next one.

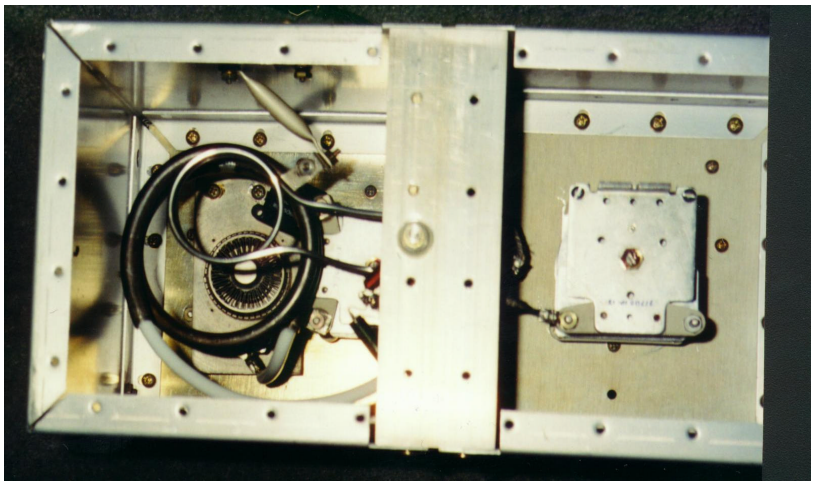
*"**Proposition 2001.02:** The board of directors shall appoint, by majority vote, a **trustee** for each repeater. The trustee shall be a member of the MMRA in good standing with a valid amateur radio license of sufficient class to allow operation of the repeater assigned to the trustee. A copy of the trustee's license shall be posted on the repeater, and a copy shall be on file with the MMRA secretary. The trustee's callsign shall be used as the callsign of record for the repeater operation and coordination unless the board elects to use a Club Callsign for that repeater; however, trustees shall be appointed for all repeaters. Each trustee shall be allowed one vote on all issues governed by the board of directors. Trustees may be replaced at any time by a two-thirds majority vote of the board of directors. Trustees shall be replaced by the board at the first board meeting after a resignation or death of a trustee.*

*"**Proposition 2001.03:** The board of directors may appoint by a majority vote a **Technical Officer** who shall be assigned to carry out the implementation of directives issued by the board. The Technical Officer is responsible for resolving technical issues required to operate repeaters in a manner consistent with FCC rules and the goals of both the MMRA and its board of directors. The Technical Officer has the authority to act on behalf of the entire board in situations where time is important, pending approval by the board at the next meeting. The Technical Officer shall be a member of the MMRA in good standing and he shall either have a valid amateur radio license of sufficient class to allow operation of the repeaters or operate with the trustee as control operator. The Technical Officer shall be allowed one vote on all issues governed by the board of directors. The Technical Officer may be replaced at any time by a two-thirds majority vote of the board of directors. The Technical Officer shall be replaced by the board at the first board meeting after his resignation or death."*

The above proposals are open for discussion and refinement at the meeting. The results will be published on the website and printed in the next newsletter.

Repeater Report in Pictures by Bryan Cerqua, W1BRI





The repeaters are running OK so there's not much to say as far as a repeater report goes. The interference from the uncoordinated 444.900 repeater is the only pressing issue.

These pictures highlight work reported in the previous newsletter. They show the 53.81 power amplifier after rewinding the coils for the plate and installing a new 4CX250B tube.

MMRA Update

Michael Ford, WZ0C, has taken on the duties of Webmaster for the MMRA. Check out the improvements at: **http://www.mmra.org/~mmra/**

Do Field Day with ABARC!

The ARRL Field Day is an emergency preparedness exercise and the most popular contest. This event is HF oriented. The MMRA has rarely set up a Field Day station.

Chuck Partain, KA1MWP, president of the Acton-Boxboro Amateur Radio Club, has invited MMRA members to join ABARC in operating Field Day from a barn in Acton on June 23 and 24. The barn is a nice place, with a loft with desk and a pool table. Use of a generator has been donated, and Chuck will make his TS-430 transceiver available.

[Field Day is always fun. It's a chance to put up wire antennas too large to fit at your home. — Ed.]

If you have some interest in participating, contact Chuck via email to Chuck.Partain@quantum.com , or telephone him at home in Maynard: 978-897-5386.

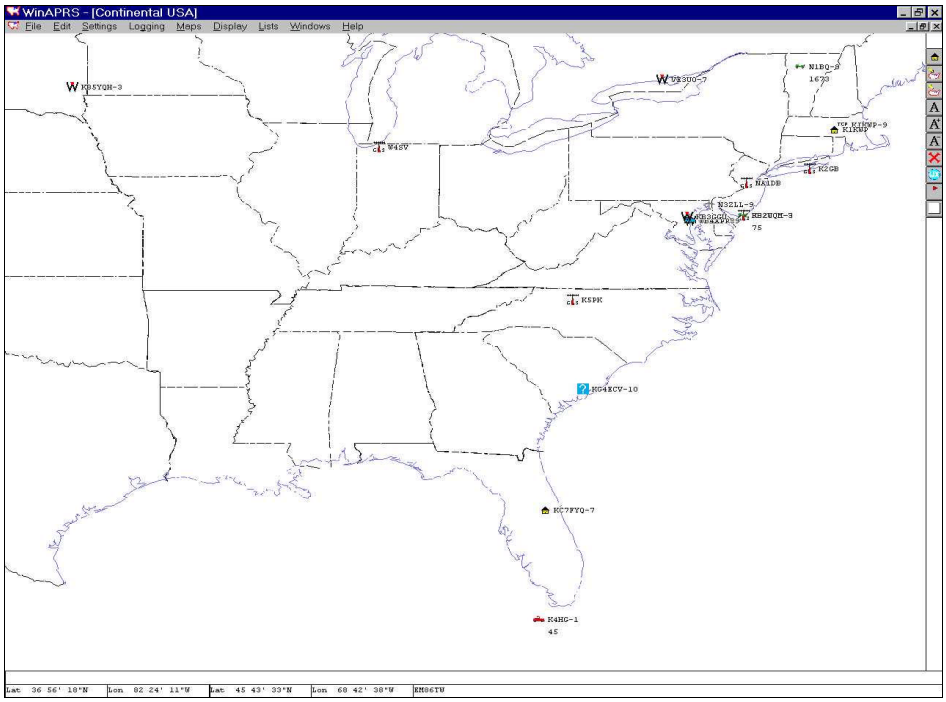
APRS via ISS by Kevin Paetzold, K1KWP

Perhaps you ran APRS in the past, and it grew old, or you are looking for a quick and easy way to get some experience using amateur satellites, or you just want a way to participate with the current International Space Station (ISS) efforts. Monitoring and using the space station as an APRS digipeater is fun and easy! WB4APR has two web pages that answer most of the questions you might have in more detail than I can cover here. The FAQ is at http://web.usna.navy.mil/~bruninga/iss-faq.html. You can also check out the stations that have recently been heard via the ISS at http://www.ariss.net/.

I have a station on the primary APRS network (144.390 MHz). On April 8 I made a quick check of my APRS system to see if I had received any messages or if there are any local weather warnings. On this evening there was an APRS announcement message from WB4APR, the originator of APRS: an experiment was underway whereby stations were invited to try to use the ISS to digipeat their packets.

From my experience doing similar things with MIR I expected this would be interesting and something I should be able to do with my existing APRS station. I was not disappointed. Indeed I received packets from stations as far away as South Dakota, and my packets were reported to be heard as far away as North Dakota. Many hams have been very successful, but I was surprised to learn that some hams (including some locally) reported no luck hearing the ISS even during passes when I heard it. Because of this I thought I would describe the equipment I used in detail (complete with URLs where I could).

My APRS system is made up of a Yaesu FT-2600 2M mobile radio running on an Astron power supply. I use a Kantronics KPC3+ TNC (http://www.kantronics.com/kpc3+.htm) connected to a PC running WINAPRS. (http://aprs.rutgers.edu/). I use a homemade vertical dipole antenna built into a piece of PVC pipe hung up in a tree about 25 feet off the ground by a rope.



Above, WinAPRS map display showing callsign and location of received stations.
Below, Table 1 — example tabular output from TRAKSAT

```
Local Date/Time Run: Sun Apr 08 20:16:08 2001
Element File:        amateur.TXT
Tracking Station:    Worcester,MA
Visibility Mode:     Line of Sight
Satellite:           ISS

Local
Date     Time      Elev  Azim   Range Lat    Long   Alt  Dopp  Dopp  Phz Sqt V
MM/DD/YY HH:MM:SS  Deg   Deg    Km    Deg    Deg    Km   Up    Down  256 Ang

                                  -- Rev # 13656 --
04/10/01 17:55:00   0.6 201.3  2174  24.5  -79.2   382   -764  -2319  84  -1 Y
04/10/01 17:56:00   4.5 195.7  1798  27.3  -76.5   382   -987  -2995  87  -1 Y
04/10/01 17:57:00   9.1 187.2  1450  30.1  -73.6   383  -1207  -3661  89  -1 Y
04/10/01 17:58:00  14.5 173.3  1155  32.8  -70.5   384  -1422  -4314  92  -1 Y
04/10/01 17:59:00  19.5 151.0   968  35.4  -67.2   384  -1631  -4949  95  -1 Y
04/10/01 18:00:00  20.0 122.7   953  37.9  -63.7   385  -1834  -5566  98  -1 Y
04/10/01 18:01:00  15.5  98.9  1118  40.2  -59.9   386  -2030  -6159 101  -1 Y
04/10/01 18:02:00  10.1  83.8  1400  42.4  -55.9   386  -2217  -6727 103  -1 Y
04/10/01 18:03:00   5.3  74.6  1743  44.5  -51.6   387  -2395  -7267 106  -1 Y
04/10/01 18:04:00   1.3  68.7  2115  46.3  -46.9   387  -2562  -7776 109  -1 Y

                                  -- Rev # 13671 --
04/11/01 16:56:00   1.7 175.1  2056  24.6  -70.2   381  -1187  -3603  79  -1 Y
04/11/01 16:57:00   4.6 165.1  1784  27.4  -67.4   382  -1415  -4293  82  -1 Y
04/11/01 16:58:00   7.2 151.8  1581  30.2  -64.5   382  -1637  -4968  85  -1 Y
04/11/01 16:59:00   8.7 135.6  1476  32.9  -61.4   383  -1853  -5623  87  -1 Y
04/11/01 17:00:00   8.5 118.2  1493  35.4  -58.1   384  -2062  -6256  90  -1 Y
04/11/01 17:01:00   6.7 102.6  1626  37.9  -54.6   384  -2262  -6864  93  -1 Y
04/11/01 17:02:00   4.0  90.1  1851  40.3  -50.9   385  -2453  -7443  96  -1 Y
04/11/01 17:03:00   1.1  80.8  2137  42.5  -46.8   386  -2633  -7991  99  -1 Y
```

About 100 feet of RG8X connect the antenna and the FT-2600. Actually it is not real RG8X but something that the Wireman (http://www.thewireman.com/coax.html) calls "CQ MINI 8 Low-Loss". This coax has a foil shield in addition to the braid, and it is supposed to have lower loss than regular RG8X. With an MFJ-259B antenna analyzer the loss of the coax was measured at 3.6 db.

(Continued on page 5)

APRS via ISS (cont.)

(Continued from page 4)

My station is a far cry from any kind of satellite station because of the type and length of coax and because of my omni-directional vertical dipole antenna vs. a beam. Good success was also reported from using mobile rigs in cars (obviously equipped for APRS in some way). As you can read in the FAQ, five watts was more than enough transmit power in almost all cases.

APRS is a great mode for sharing a single channel resource like the ISS digipeater. Since APRS uses unconnected packets many stations are able to take part in the experiment while using a minimum share of the resource (just seconds of perhaps a ten minute usable window while ISS passes overhead). Another benefit of using APRS is that most of the received packets automatically cause the originating station to be displayed on the map giving instant visual feedback of the location of the received DX stations.

As a rule the satellites that amateur radio operators interact with are moving all the time as opposed to being geostationary as most commercial satellites (like the ones used for television) are. Because the target (the ISS) is moving it is important to know when it will be passing overhead. There are various ways to get this information. On the web are various places to get this information with differing features, interfaces, and ease of use. NASA maintains web sites called "JPASS" (http://liftoff.msfc.nasa.gov/RealTime/JPass/20/) and "JTRACK" (http://liftoff.msfc.nasa.gov/realtime/JTrack/Spacecraft.html). You can use those websites (or others) to determine where a given spacecraft currently is and also when it will be visible from your location.

Orbits of spacecraft are quite predictable via calculations. NORAD (http://www.spacecom.af.mil/norad/) keeps very close track on objects and produces new keplerian element data regularly. The keplerian elements precisely describe the orbit of a satellite.

I usually get the updated elements from AMSAT at http://www.amsat.org/amsat/keps/menu.html (specifically at http://www.amsat.org/amsat/ftp/keps/current/nasa.all). I use TRAKSAT, a shareware program, to determine the passes over my location. TRAKSAT has various graphical display modes but the tabular display, illustrated in Table 1, shows the times of upcoming passes for a given latitude and longitude. TRAKSAT is available at http://home.hiwaay.net/~wintrak/prod03.htm. The orbital parameters of spacecraft do change over time and small changes in an orbit can result in large changes in the predicted times. If you are using a program like TRAKSAT (instead of an automatically updated web site), it is important to update your keplerian elements or "keps" on a regular basis.

Table 1 shows some ISS passes which would be visible in the Worcester, MA area the evening of April 8, 2001. The time in the example table is shown as local time (EDT). The most important items in this data are the date/time, the degrees of elevation above horizon, and the azimuth (true compass direction). The time period in this example is incremented at one-minute intervals and the position recalculated when the satellite is visible. In revolution 13656 we can see that the satellite rises at 17:55 in the Southwest and sets at 18:04 in the Northeast. Eventually the satellite reached 20 degrees above the horizon before it started to descend. You can also see from the table that not all passes are equal. In orbit 13671 the satellite only gets 8 degrees above the horizon. What happened to revolutions between 13646 and 13671? Some of them I deleted for space in the article; however, during some of them the satellite was determined to never be visible from my location.

Now that the times of passes have been determined, it is important to know what frequencies to operate on. In this case the frequencies were given in WB4APR's message and were listed as Uplink: 145.990 MHz and Downlink: 145.800 MHz. This is an interesting case because both frequencies are in the 2-Meter band so the Doppler shift from the moving satellite is minimal (about +-7 KHz) and should not cause a major tuning issue for an FM signal being received by an FT-2600. A 430 MHz signal would have much more Doppler shift requiring retuning during the pass.

I recommend initially setting up your station in receive-only mode on 145.800 MHz to monitor the various ISS passes without transmitting. Once you have determined that you are able to hear the packets from the ISS, check the URLs at the beginning of this article for further details on recommended transmit rates and the current guidelines for considerate use of the resource.

For more details on the "Amateur Radio on the International Space Station" project the URL is http://ariss.gsfc.nasa.gov/. For more information on the amateur satellite program see the AMSAT-NA web pages at http://www.amsat.org/.

Voice contact with ISS is also sometimes possible via the same downlink frequency (145.800 MHz) and an uplink frequency of 144.490 MHz. Once again check out the web pages above for schedule details.

Reminder: A considerate operator would make sure that they could hear a satellite before transmitting to it with either voice or packet.

For further information please feel free to contact me via email (K1KWP@AMSAT.ORG), or via 53.81, 146.610, and 449.925, or on the MMRA Tuesday night nets.

I wish to thank N1QPR who has been my satellite Elmer and introduced me to APRS, amateur satellites and the TRAKSAT program!

Practice Net Control

Would you like to try running one of the MMRA nets? Take a spin at being net control once or twice on the Tuesday evening net. Contact any club officer for details.

Fox Hunting News by Michael Ford, WZ0C

The MMRA holds foxhunts every Saturday morning beginning at 10 AM on the 146.61- repeater. Thursday, May 3rd, marks the first of the summer evening hunts. These hunts will be every Thursday evening at 6 PM on the 146.82- repeater. The fox transmits for 30 seconds every 5 minutes on the input of the repeater, and then coordination usually takes place on the repeater between the fox transmissions. All are welcome to join, and the group usually visits a local restaurant for brunch on Saturday or dinner on Thursday after the last hunter has arrived at the fox's location.

The following are accounts of the past few hunts.

Apr 28: Kevin, K1KWP, hid in Marlboro behind the old newspaper building on Rt. 85, near the Scrub-a-Dub. The hunters all had trouble receiving Kevin's signal, which led them to assume he was hiding very near the repeater site. It turned out that he was using a handheld three element Yagi to aim his signal away from Rt. 85 and a roll of coax to attenuate it. Mike, WZ0C, started the hunt driving up Rt. 85, and the first time he heard Kevin, he got a swing on the Doppler unit. He arrived in just under 15 minutes.

Initial bearings: WA1NLR: 127 deg
W1JDO: 300 deg
Fox Location: 42,20.347N 71,32.427W

Apr 21: Mike, WZ0C, hid at the South Marlboro Electric Substation near the intersection of South St. and Rt. 85 in Marlboro. There was a lot of participation in this hunt with many home and mobile stations calling in reports. Eddie, N1NOM, was first in after 90 minutes. He drove by the driveway to the substation five times before deciding to go in and see if the fox was there.

During this hunt, several mobile and home stations also called in signal strength reports, including: W1HGU, Ned, in Marlboro; N1DAM, Greg, and N1BE, Bob, in Stow; N1QPR, Bill, and N1VJE, Shelley, on I-495; and K1KWP, Kevin.

Initial bearings: W1DYJ: 247 deg,
W1JDO: 285 deg, K1KMN: 270 deg
Fox Location: 42,20.016N 71,32.831W

Apr 14: Dick, K1KMN, hid in Needham Center in a parking lot behind the train station "under the trains". This threw the hunters for a loop as they expected Dick to be in or around Framingham, following his usual modus operandi. The hunters travelled east, east, east following Dick's signal until they got to Rt. 128. Then they went south, south, south until they got to Needham. They knew Dick was close, but he was hidden well. The hunters drove all over Needham Center for quite a while, checking all of the parking lots they could find. Finally, just before the two hour mark, Mike, WZ0C, checked a parking lot he'd missed and spotted Dick's truck.

Initial bearing: W1JDO: 345 deg
Fox Location: 42,17.430N 71,14.191W

Apr 7: There was no hunt this day.

Mar 31: Mike, WZ0C, hid on Brimstone Lane at the Framingham/Sudbury line on Nobscot Hill. This was a great day for a foxhunt, and two hunters came out. Dick, K1KMN, was first in after finally deciding that, yes, he really should take a look on top of Nobscot Hill.

Initial bearings: K1KMN: 295 deg
W1JDO: 315 deg
Fox Location: 42,20.962N 71,27.308W

Mar 24: Bill, N1QPR, and Shelley, N1VJE, hid in the 3com parking lot in Marlboro. This was a nice sunny day, and several hunters came out to join the fun. Kevin, K1KWP, was the first into the parking lot, but the security guard scared him away before finding Bill and Shelley. Mike, WZ0C, and Amrith, K1ANN, had driven atop a Fidelity parking garage next door to get a bearing that pointed straight to the 3com hill. On their way into the 3com lot, they passed Kevin on his way out. They also encountered the security guard, but this time the security guard was sitting by Bill and Shelley. The guard didn't want the honor of winning and the onus of hiding next week so Mike and Amrith called first at 40 minutes. **See photos on next page.**

Initial bearings: W1DYJ: 245 deg,
K1KMN: 260 deg, W1JDO: 300 deg
Fox Location: 42,19.401N 71,35.048W

The MMRA also has an automatic "**Fox Box**" that is hidden on most weekends. The Fox Box is a green ammunition box (with the ammunition replaced by a transmitter, a battery, and some control circuitry) with a 1/4-wave antenna mounted on it. The box transmits for 30 seconds every two and a half minutes on 145.63 MHz with a PL tone of 146.2. Once you find the box, sign in on the pad of paper located in the end of the box.

Recently, Mike, WZ0C, has been hiding the box on Fridays and picking it up on Wednesdays. Announcements of the Fox Box being hidden and clues about its whereabouts are sent to the MMRA mailing list on yahoogroups. If you would like to receive the announcements but don't wish to join the list on yahoogroups.com, send email to wz0c@arrl.net to be added to his fox-only list.

Fox box reports:

Apr 26: The fox box was on the boat ramp off of Lowell Rd. in Concord. It was found by: Bob, N1BE; Greg, N1DAM and Bill, N1CPK; and Gary, KD1TE.

Apr 19: The fox box was hiding on the hill at Summit Ave. in Brookline. No one found it.

Apr 13: The fox box was hidden at the Duck Pond in Waltham, which is by the Charles River and opposite the Marriott Hotel in Newton. No one found it.

April 6: The fox box was hiding in an industrial park immediately to the SW of the I-90/I-95 intersection. Tim, KD1KY, was the only one to find it.

March 28: The fox box was hidden in a difficult location. It had plenty of elevation and could be heard for at least 15 miles in every direction. Finding it also involved climbing a more than 300 foot hill through snow and mud. Gary, KD1TE, was the only to find it. Way to go, Gary! The box was in the Middlesex Fells in Medford/Stoneham at the top of Bear Hill, near the lookout tower.

Public Service Volunteer Opportunities in the New England Division by Ralph Swick, KD1SM

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
May 6	Boston MA	Walk for Hunger	Bob K1IW	413-647-3060 wfh@dematti a.net
May 13	Devens MA	Parker Classic Road Race	Stan KD1LE	978-433-5090 kd1le@amsat.org
Jun 20	Gloucester MA	ADA Tour de Cure, Bike Tour	Keith N1HLK	781-631-2262 N1HLK@nsradio.org

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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.

After the hunt...

These pictures were taken by Shelley, N1VJE, at the conclusion of the March 24th fox hunt. The photo above shows Dick K1KMN, Bill N1QPR, Amrith K1ANN, Eddie N1NOM, Mike WZ0C, and Kevin K1KWP.

To the right is Kevin's vehicle with antennas stylistically reflected in the shiny hood. Eddie is in the car behind. Dick, Kevin and Kevin's dog Caneel are enjoying the sunshine.

Next Meeting — Wednesday May 16, 2001

MA State Police Trunk Radio System, Annual Elections

At the May 16th MMRA meeting, we hope to have a speaker who will discuss the Trunking Radio system used by the Massachusetts State Police. This type of radio system operates differently than the fixed frequencies conventionally used. Trunking is an automatic sharing of a pool of channels among users. A central unit automatically assigns channels to users on demand. This provides more efficient spectrum usage and reduces the chance of a user needing to wait for a free channel. Trunking also enhances privacy.

Elections of MMRA officers and board of directors positions will be held during the meeting. We will also be holding a vote to amend the MMRA bylaws to give board member voting rights to repeater trustees.

Calendar of Ham Radio Events

May 14:	Greenfield MA flea
May 16:	**MMRA meeting:** trunking radio systems and elections
May 20:	Flea at MIT
Jun 9:	Barnstable MA flea
Jun 23-24:	ARRL Field Day
Jun 20:	**MMRA Board meeting**
Aug 31:	**MMRA Newsletter Deadline**
Sept 19:	**MMRA meeting**
Oct 26:	**MMRA Newsletter Deadline**
Nov 21:	**MMRA meeting**

(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

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WE'RE ON THE WEB!
WWW.MMRA.ORG/~MMRA