The Minuteman Repeater Association



The Minuteman



Volume 32, Number 3 January 2003

President's Corner by Kevin Paetzold, K1KWP

Work Party in Marlborough: On November 23 we had a work party in Marlborough as announced in the previous newsletter. The antenna for 53.81 was damaged in the ice storm which preceded the work party by a week or two. During the event the antenna for 53.81 and the guy cables (previously guy ropes) were replaced. Various other problems at the site were discovered (eg. rodent damage to various pieces of coax). I would like to thank W1BRI for planning and choreographing the work party. As a result of Bryan's directing this activity a lot was accomplished and everybody on site was kept busy and no one was hurt. Of course I would also like to thank N1BE, KC1US, WA1NLR, N1XXI, and N1NOM for all their help (all day long). I hope I did not forget anyone. Some pictures from this event are available at: http://www.mmra.org/club/events/5381pics.html

Simulated Emergency Test: On Saturday November 9, several members of the MMRA participated in the EMA ARES SET. N1QPR as MMRA Emergency Coordinator and Acton RACES officer, produced a plan that employed three teams of radio operators (made up from several different radio clubs and local towns). By all accounts everybody participating learned a lot and it was a valuable exercise. One of these teams was led by N1BE and in addition to the usual VHF/UHF modes also included HF using NVIS techniques. Pictures from Bob's team are available on page 7 and more are at: http://home.tiac.net/~vantine/set/index.html.

Last Meeting: As announced in the last newsletter, the previous general meeting of the MMRA was held on November 20th at AMR. First I would like to thank WA1NLR for setting this up and for arranging for Brendan McNiff from AMR to speak to us about AMR and its operations. Questions from the audience occupied at least an hour and with the tours and additional ARES business it was a long meeting. This was attended by guests from other local clubs because we offered time at this meeting for W1MPN (EMA ARES SEC) to hold a debriefing and feedback session for the Middlesex County radio operators that took part in the SET that occurred about ten days before. Pictures are available on page 6 and more are at: http://www.mmra.org/club/events/amrpics.html

The CPSG meeting: I try to work various public service events during the year. Many of those events are coordinated

by the Crocker Public Service Group. I attended a meeting of the CPSG on October 29th. At that meeting I was very pleased to hear a long list of the number of CPSG public service events that the MMRA supported in the last year through the use of the individual repeaters and/or the whole system. From the bylaws of the MMRA, and my own belief as well, providing and maintaining our repeater infrastructure in order to support events like these is one of the most important services that we provide. The list included five CPSG events (ten repeater assignments) plus also some info events that employed the whole system. All of us that support the MMRA should be proud for supporting these events which are so important to the society and community that we all live in.

Next meeting: The next meeting of the MMRA will be a general membership meeting on Wednesday January 15th at 7:30PM at the Campion center in Weston. The speaker's subject will be radio astronomy. Directions and maps are available on the MMRA web page at www.mmra.org. Details are available elsewhere in this newsletter. This sounds like it will be another very interesting presentation. I hope to see you there.

MMRA Holiday Get Together: As announced on the MMRA email lists and during the Tuesday night 8PM TIAOS (Technical, Information, and Other Stuff) nets we had a somewhat hastily scheduled get together on Thursday Dec 19 at the

Southborough House of Pizza, (S.H.O.P.). We did not make a list or take pictures but we had pretty good attendance and it was good to see all those who attended.

I would like to thank Bob, K1IW for introducing us to the meeting room at the S.H.O.P. I am sure it will come in handy for some future meetings and events (although I expect my doctor will wish I did not know about this place).

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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/

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	WZ0C	PTL
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
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: PL is now required on 2 meters to prevent interference.

The code **750** will temporarily disable the PL requirement.

Using the Only the hub has a telephone line.

Autopatch: (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	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
Webmaster	Michael Ford	WZ0C

President's Corner (cont.)

(Continued from page 1)

MMRA Board meeting on Wednesday February 19: Official Observer Coordinator (OOC) for EMA to speak at this meeting. Mike Goldberg, K1LJN, is the OOC. He will speak about the Official Observer (OO) function and interference committees. Various items of MMRA business will also be taken care of at this meeting. Board meetings are held at 7:30 PM on the third Wednesday's of months which do not have general membership meetings. Most board meetings are held in Maynard, MA at the offices of Stratus Technologies. All MMRA members are invited to attend. Directions and maps are available on the MMRA web page, www.mmra.org.

The only other planned board meeting, besides February, before the MMRA elections in May will be in April. Board meetings are where decisions are made and plans are discussed (see some of my previous newsletter articles). Please consider attending.

CEMARC Youth Net: As announced in the previous newsletter the "Youth Net" held its first session on Sunday November 10. Held weekly on Sundays at 7 PM, this net has had good attendance. Most of the operators checking in hold their own licenses; some of the operators checking in are under the supervision of their parents or another licensed adult. It is clear from listening that this was the first time on the air (or on a repeater) for several of the operators (even some of those who hold their own license). I would like to thank KA1PON and N1DHW for their efforts in making this net happen. I was very happy to be able to offer the MMRA linked repeaters as a resource for this net. This is something that all the members of the MMRA should be proud of. It is your efforts and your memberships in the past, present, and future that made the linked system available for this purpose. For myself I believe that this effort has justified the time and effort that I myself have put into the MMRA. I hope that you feel the same way!

The MMRA Was There! by Bruce Pigott, KC1US

The Boston Marathon, the Walk for Hunger, the Yankee Tour, the Ride for Hunger and the Jimmy Fund Marathon Walk is where both the members and the repeater system of the Association were in 2002. Starting in April and going through October, many individuals of the MMRA participated in these public service events. The MMRA repeaters were also a key part of the support during these activities. The organizers are grateful for the range of skills radio operators bring to these events. Now that the flakes are flying, it is time to fill

out the reports and find out what happened to all those adaptors that disappeared.

Thank you again from Steve Schwarm W3EVE, coordinator for the marathon events, Bob DeMattia K1IW, for the Project Bread events and myself for the Yankee Tour.

[Doing public service is a great way to see one of these events up close. If you haven't done public service before, it's easy to learn how while working an event.. — Ed.]

Ham Radio License Classes

This winter short ham radio license classes are being offered by both the Framingham and Billerica clubs. These classes provide an opportunity to be trained and take the license exam immediately in a day or a weekend:

The **Framingham Amateur Radio Association**, FARA, (http://www.fara.org/) is sponsoring a "license in a weekend" class on March 14-16, 2003, for people looking to get an entry-level Technician amateur radio license.

The class will meet in the Danforth Museum basement on Lexington Street in Framingham on Friday from 7 to 9 PM, Saturday 9AM to 5PM, and Sunday 9AM to 4PM.

Students must supply their own copy of the text book, No Code Technician License Manual - 4th Edition by Gordon West, which is available from Radio Shack.

There is a \$20 fee for this class which includes the fee for the license exam and lunch Saturday and Sunday. Preregistration with the fee is required.

Contact Ed, W1NXC at 508-881-2301 for more details about the class in Framingham.

The **Billerica Amateur Radio Society**, BARS (http://66.189.41.71:8080/pictures/bars/index.htm) is sponsoring a one day ham radio class to help you get your Technician class license on Saturday February 8, 2003. Knowledge of the Morse code is NOT required for this license. The class will cover all of the topics needed to pass the exam.

The class will be taught at the Murdock Middle School, 42 Brick Kiln Road, Chelmsford MA. The class will run from 9 AM to 6 PM. At 6:30 PM there will be a VE session where you can take the Exam to get your license. The cost of the class is \$15. The \$15 fee includes BARS membership for one year. The fee is waved for current BARS members and their family. In addition, the exam will cost \$12.00.

To prepare for the class it is recommended that you purchase and review the book <u>Now You're Talking! - 4th Edition</u> before the class. This book is available at most Radio Shack stores, at Ham Radio Outlet in Salem NH, and on the web from www.ARRL.org and from www.Amazon.com

Please contact Bruce Anderson, W1LUS, if you wish to register for this class. Space is limited. People will be registered on a first come basis. E-mail to W1LUS@att.net or Phone 987 851 2886.

Repeater Report by Bryan Cerqua, W1BRI

Since the last newsletter, there was work done to the 6-meter transmit site and the Weston 1.25-meter repeater.





53.81 MHz antenna

N1BE clamping it to the mast.

53.81: First I would like to thank the following for helping out at the 53.81 antenna work party: Bob N1BE, Bill WA1NLR, Wayne N1XXI, Eddie N1NOM, Bruce KC1US, Kevin K1KWP, Bryan W1BRI and any others that I might have missed. This work party was a great success, the older Diamond DP-GH62 antenna, which sustained damage from the heavy ice coating a week earlier, was taken down and replaced with a much sturdier PD83. All the fraying Dacron rope guys were replaced with steel aircraft cable. The new antenna is standing straight and looks great. The PD83 was trimmed to work on 53.81 by WA1NLR, N1BE and N1NOM using my MFJ269 antenna analyzer. We have a web page with more pictures from this work party at:

http://www.mmra.org/club/events/5381pics.html

N1XXI noticed that one of the link coax cables was chewed down to the center connector by some mice. The following day K1KWP and I went back to the site to repair the coax. We also found some mice running around inside the 53.81 cabinet. I had a good laugh when Kevin carried one of the mice out using my hemostat. I spent most of the next day replacing the link radio coax cables. The original link antennas were in bad shape so I decided to replace them. The 53.81 link radio is now using a small beam. The 146.61 link is now

using a new omni Maxrad antenna. These antennas are mounted on the 10 foot TV mast that was removed from the 53.81 crank-up tower. To keep the mice out I used a copper feed through pipe to protect all three link coaxes. The holes in the shelter were sealed using some silicone caulk, hopefully the mice will find a new home elsewhere.

The tube power amplifier for 53.81 was removed for servicing and a mobile 75-watt PA is temporarily in place while I fix the tube amp. The plate coil clamps had burned up due to the over current protection circuitry not working, see attached photos. When the plate current exceeds 375ma it is supposed to trip off. The ice loading on the old Diamond antenna caused the SWR to go sky high and I suspect this caused the failure.

The tube amp is a converted low split (30 to 42 MHz) unit. I borrowed a high split version (42 to 54MHz) of this tube amp from Kurt Jackson, W1OBQ, for checking the modifications I made to our amp. I was happy to see that the plate coil



Working in and on the radio shelter.

(Continued on page 5)

Repeater Report (cont.)

(Continued from page 4)



Oxidized 6-Meter Amp Plate Circuit

and coupling coils were exactly the same as the borrowed amp. I also discovered that the low pass filter coils were different so I modified ours to match. The high voltage doorknob capacitors that I changed when the amp was first modified were correct. Since our amp was a revision E and the one borrowed from Kurt was revision C, I decided to leave the grid drive circuitry alone. The damage to our amp has been repaired and re-assembly is now in progress. I also added a Bird inline panel mount power meter to the system that will allow the forward and reverse power to be easily checked when at the site. I hope to re-install the tube amp sometime in January. I would like to run no less than 200W if possible making it easier to hear on my commute.



Cleaned-up 220 MHz receiver with external preamp on the right..

224.70: I added a PL board to the Weston 220 receiver. The receiver wiring was also cleaned up by removing the relay glued externally to the receiver. The COR input to the Scom 5K controller is now wired to the PL detect output of the PL board; this was done to avoid needing any changes to the controller. I found the trimmer cap for adjusting the frequency of the local oscillator to be broken. After re-installing the receiver I couldn't understand why it could not hear me on the HT just a few miles away. Then I realized that I forgot to screw in the antenna cable on the receiver, so I drove back to the site to hook up the antenna feed. Upon leaving the site I spoke with N1NOM on it and it sounded terrible, at this time I realized that my patched up trimmer capacitor must have failed. The following weekend I pulled out the receiver again. The receiver is now on my bench awaiting repair and hopefully after the fourth trip to the site it will be up and running again. The preamp mounted to the receiver was tuned up. I plan to try using the preamp since it seems to help out greatly with receiver sensitivity. It can be easily bypassed if so desired in case any difficulties. An LED was added to the front panel to indicate when a signal with the proper PL is being received.



Front panel of Weston 220 MHz receiver.

I tried using a donated 220 MHz power amplifier. It didn't work so I pulled the cover off and found the TX/RX relay contacts to be glued shut. I guess the original owner decided not to fix the carrier detect circuit that controls the relay. I put this aside for now until I finish the 53.81 tube amp. Thanks to Eddie N1NOM and Bob K1IW for lending me their 220 MHz radios for testing the amp.

223.94: The 223.94 repeater's link radio is a suspect for the frequent unwanted key ups of the Hub repeater. During the ARES Sunday night net the 223.94 repeater was making all kinds of strange noises. It might be that something is bothering the input to the 223.94 repeater or the PL board is faulty causing the link radio to key up without audio. I spoke with Andy, N1BHI, and hopefully soon we can gain access to the site to check out what might be causing the network key-ups. I believe that the 223.94 repeater is not linked at his time.

Photos from the November 20th MMRA Meeting



Our host Bill, WA1NLR, beside the AMR radios.



Bill, N1QPR, taking a close look at an AMR dispatcher station.

To the right, Brendan McNiff speaking. Attendees below include other clubs.



ARES Net on the move

The monthly Eastern Massachusetts ARES net that meets on the linked MMRA repeaters has been rescheduled. Effective January 2003, this net will meet the 3rd Sunday of each month at 8PM Eastern Time. The net control operators will need to manually link the repeaters for this net since the controllers have not been programmed to link the system automatically.



Youth Net Launch Success

Last edition of the Minuteman announced the CEMARC ("Council of Eastern MA Amateur Radio Clubs") Youth Net.

ACC and CEMARC president Frank Murphy, N1DHW, writes: "This week's CEMARC Youth Net reached its second milestone. Young Kelsey McGovern, using her father John's call, W1JMC, acted as Net Control for the net entirely on her own this week. She performed her net control duties perfectly by maintaining control, generating a platform for participant discussion, and overall, sounded like a professional net control with years of experience."

The Youth Net meets weekly at 7 P.M. Sundays on the MMRA linked repeater system. Although restricted to youths up to 12th grade, it heartwarming for us older Hams to listen to the future of Amateur Radio.

New 6-Meter Repeaters by George Cleveland, WA1QGU, 6-Meter Coordinator, New England Spectrum Management Council

Just a quick note to update you on 6-Meter repeater activity in our territory. As recently as five years ago, 6-Meter repeaters were few and far between here in the Northeast. The data available was quite often inaccurate or the repeater site had been down for years. There seemed to be less excitement for builders to construct a site, there were fewer radios on the market to purchase and the TVI factor was greater with more home television antennas in use then than we have today.

Here we are nearing the end of 2002, and things are looking up for the "magic band". Most television households rent cable or a dish service allowing us to emit 52 MHz RF with fewer if any complaints, also the onslaught of HDTV will be a UHF only issue. There are now six or more manufacturers of 6-Meter handhelds and mobiles not including the great commercial gear available to modify. With a few square feet of mountaintop property more difficult than ever to procure there are some very aggressive site builders who somehow manage to end up on top of great topographical bumps. There has been

a major turnaround in usage of 6 Meters, including AM, SSB, CW. Now if someone could just make those great band openings appear more often!

All of the 51 and 52 NESMC 6-Meter repeaters are open to all licensed hams. In the past six months there have been four new additions: 53.03 in Weymouth MA, 53.65/PL 71.9 in Salem NH, 51.90/PL 71.9 in Holland Mass and 53.25/PL 100.0 in Cooper Maine. The owners/trustees tell me they welcome any and all users and look forward to feedback on coverage.

For up to date information on Six, NESMC reminds the public to browse our website at www.nesmc.org or check the latest ARRL repeater directory. Questions regarding Six can be sent to me at rcvxmt@aol.com. [George supplied a NESMC list of 6-Meter repeaters that appears in the email version of the newsletter. Another excellent information resource is the New England Repeater Directory at: http://www.nerepeaters.com/ — Ed.]



"Acton-1"
Relay Station
Team with
MMRA
members
during the
November
9th
Mass.
A.R.E.S.
Simulated
Emergency
Test.



Marconi 100th Anniversary Special Event

K1VV and the Marconi Radio Club are proud to announce a special celebration to commemorate the 100th Anniversary of Guglielmo Marconi's first wireless transmission between the United States and Europe.

"From atop high, sandy cliffs overlooking the Atlantic, Marconi transmitted a simple, 54-word greeting from President Theodore Roosevelt to Great Britain's King Edward VII. Within hours, the King acknowledged receiving the message, and the spark of global communications was lit."

The Marconi Radio Club, W1AA, and the Marconi Cape Cod Memorial Radio Club, KM1CC, working in partnership with the National Park Service at Cape Cod National Seashore, will operate a Special Event station on January 11 through 19, 2003 at the former Coast Guard station at Coast Guard Beach in Eastham, Massachusetts, near the site of the Marconi's original 1903 station. From 9:00 AM to 5:00 PM each day, the public will be able to tour the station, listen to voice and Morse Code communications with other radio operators around the world, and learn about wireless technology and the significance of Marconi's achievement. For more details see: http://personal.tmlp.com/k1vv/w1aa.

6-Meter Sites courtesy of the New England Spectrum Management Council

Location	Region	State	Output	Input	Call-ID	Notes, Tones Out / In	Sponsor
Coventry	NorthEastern	СТ	51.000	50.400	K1JCL	O Amplitude Modulation L	K1JCL
Burlington	West.Central	СТ	53.010	52.010	WA1LMV	O T-162.2/162.2 L	WA1LMV
Bristol	West Central	СТ	53.050	52.050	WA1IXU	O T-162.2/162.2	WA1IXU
Tolland	NorthCentral	СТ	53.150	52.150	W1GPO	O E ca T-100.0/162.2	W1GPO
E.Hartland	Northern	СТ	53.190	52.190	W10BQ	T-162.2/162.2 L	NYNES
Vernon	Central	СТ	53.390	52.390	KJ1Q	O T-162.2/ 71.9 L	KJ1Q
Montvale	Southeastern	СТ	53.410	52.410	K1IKE	O T-156.7/ 156.7	K1IKE
Bridgeport	South Western	СТ	53.590	52.590	KD1RJ	O T-ca 103.5/100.0 L	FCSP
Groton	Southeastern	СТ	53.850	52.850	W1NLC	O T- XXX/156.7	SCRAMS
Whitman	South Shore	MA	51.700	51.200	TBA	0	
Holland	Central	MA	51.900	51.400	N1NTE	O T- 71.9/ 71.9	N1NTE
Weymouth	South Shore	MA	53.030	52.030	W1SM	O XXX/CSQ	W1SM
Billerica	Merrimack Valley	MA	53.070	52.070	W1DC	O DS-100.0/ 71.9	1200 RC
Pelham	Pioneer Valley	MA	53.090	52.090	N1PAH	O T-100.0/162.2	N1PAH
Windsor	Berkshires	MA	53.190	52.190	W10BQ	T-162.2/114.8	NYNES
North Adams	Berkshires	MA	53.230	52.230	K1FFK	O T-162.2/162.2 X	NoBARC
Waltham	Boston	MA	53.250	52.250	WA1HU	O T- XXX/ 71.9	WA1HUD
Framingham	MetroWest	MA	53.270	52.270	WA1NVC	O T-100.0/ 71.9 X	WA1NVC
Princeton	Central	MA	53.310	52.310	K1KZE	O T-100.0/162.2 or 71.9 EXLR	MEMA
Quincy	Boston	MA	53.330	52.330	K1USN	O T-100.0/100.0	USSSRC
Amherst	Pioneer Valley	MA	53.350	52.350	KD1XP	O T-71.9/ 71.9 e	KD1XP
Oakham	Central	MA	53.670	52.670	KA10XQ	O E-sun T-XXX/123.0	KA10XQ
Marlborough	MetroWest	MA	53.810	52.810	W1BRI	O T- 71.9/ 71.9 or	MMRA
Sharon	Boston South	MA	53.850	52.850	N1UEC	O T-XXX/ 71.9	N1UEC
Pepperell	Merrimack Valley	MA	53.890	52.890	N1MNX	O T-100.0/100.0 L	N1MNX
Fall River	South Coastal	MA	53.910	52.910	N1LDY	O CA E-Sun R T-XXX/ 71.9	N1LDY
Arundel	Southern Coast	ME	53.050	52.050	K1AAM	O T XXX/136.5	K1AAM
Woodstock	Lakes + Mountains	ME	53.090	52.090	W1IMD	O T XXX/136.5	W1IMD
Winthrop	Moose River Valley	ME	53.150	52.150	KA1SHU	O XXX/CSQ	KA1SHU
Cooper	Downeast Acadia	ME	53.250	52.250	КВ1НХС	O XXX/100.0	SCRG
Parsonsfield	Southern Coast	ME	53.370	52.370	W1ZOU	O T-136.5/136.5	PWAWA
Washington	Washington	ME	53.550	52.550	KC1CG	O T XXX/ 91.5	KC1GC
Portland	Greater Portland	ME	53.570	52.570	N3LYT	O T XXX/103.5	K1AAM

6-Meter Sites (cont.)

Location	Region	State	Output	Input	Call-ID	Notes, Tones Out / In	Sponsor
Bald Mtn.	Ashe county	NC	53.330	52.330	AB4JJ	O T-XXX/100.0	AB4JJ
Mt. Mitchell	Burnsville	NC	53.630	52.630	AB4JJ	O T-XXX/100.0	AB4JJ
Hudson	Merrimack Valley	NH	53.130	52.130	N1EB	O T- 88.5/100.0	RRA
Peterborough	Monadnock	NH	53.190	52.190	W1OBQ	T-162.2/203.5	NYNES
Sargents Pur-	White Mountains	NH	53.190	52.190	W1OBQ	T-162.2/141.3	NYNES
Pelham	Merrimack Valley	NH	53.410	52.410	K1SI	O T- 127.3/127.3 L-443.150@131.8	K1SI
Walpole	Monadnock	NH	53.430	52.430	N1SJK	O T- 88.5/88.5 {HD}	N1SJK
N.Pembroke	Merrimack Valley	NH	53.590	52.590	KA10KQ	O T-100.0/ 71.9 {HD}	NHRC
Salem	Merrimack Valley	NH	53.650	52.650	N1WPN	O T-100.0/ 71.9	N1WPN
Brookline	Merrimack Valley	NH	53.930	52.930	N1IMO	O T-88.5/ 88.5 L	N1IMO
Hudson	Merrimack Valley	NH	53.970	52.970	N1VQQ	O T-71.9/ 71.9 L	N1VQQ
Holmdel	East Central	NJ	53.470	52.470	W2GEZ	O T-131.8/136.5	WB2MAZ
Paramus	Northeastern	NJ	53.490	52.470	W2GEZ	O T-131.8/136.5	WB2MAZ
Olivebridge	Hudson/Catskills	NY	51.760	51.260	N2NCP	O T-XXX/103.5	N2NCP
West Hills	Central L.I.	NY	53.110	52.110	WB2CIK	O T-XXX/ 107.2 L	WB2CIK
Schroon Lake	NorthEastern	NY	53.130	52.130	KE2LS	O T-XXX/118.8	KE2LS
Harriman	Southeastern	NY	53.170	52.170	WA2LVY	O T-XXX/136.5	WA2LVY
Stamford	Catskills	NY	53.270	52.270	K2NK	O T-XXX/107.2	K2NK
Beacon	SouthEastern	NY	53.310	52.310	K2ROB	O T-114.8/114.8 X	K2ROB
Rochester	Northwest	NY	53.330	52.330	N2HJD	O T-123.0/123.0 L	N2HJD
Woodstock	Northeastern	NY	53.330	52.330	W1OBQ	T-162.2/162.2	NYNES
Albany	NorthEastern	NY	53.410	52.410	W2GBO	O XXX/CSQ E W	W2GBO
Manhattan	Southeast	NY	53.730	52.730	KQ2H	T-XXX/107.2 L X	KQ2H
Hoosick Falls	Eastern	NY	53.810	52.810	K2RBR	O XXX/CSQ	K2RBR
Wallkill	Southeast	NY	53.870	52.870	N2TMT	O T-136.5/136.5	N2TMT
Cranston	Greater Providence	RI	53.290	52.290	W1IMD	O T-162.2/162.2 X	W1IMD
Corinth	East Central	VT	53.210	52.210	ТВА	O T-XXX/131.8	

Next Meeting — Wednesday January 15, 2003 John Wardle: Radio Astronomy

John Wardle, http://www.physics. brandeis.edu/faculty/ward.htm teaches physics and astronomy at Brandeis University. His research, http://pc.astro. brandeis.edu/ is mostly on radio astronomy, especially looking at the nuclei of lives in Wrentham, makes wine, and

very distant galaxies and quasars, using the Very Long Baseline Array:

http://www.aoc.nrao.edu/vlba/html/ vlbahome/thesites.html

When he is not at his day job, John

raises boys.

This talk will be an introduction to large antennas, arrays of antennas, the sorts of measurements made and the images seen, when peering across the universe at radio wavelengths.

Calendar of Ham Radio Events

Jan 11-19: Marconi 100th Anniversary

Special Event Station

Jan 15: **MMRA** meeting

Feb 8: Billerica License-In-A-Day Class

Feb 15: Marlborough Algonquin Flea Feb 16: Westford Antique Radio Flea

Feb 19: MMRA board meeting with

K1LJN, EMA OOC.

Feb 28: **MMRA Newsletter Deadline**

Mar 14-16: Framingham License Class

Mar 19: MMRA meeting

May 21: MMRA elections & 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

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

Email: mmra@mmra.org



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

Minuteman Repeater Association Quick Membership Renewal (Please use reverse side for new memberships)

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Dues paid (please check one):
☐ Individual Membership (Dues: \$25 per year)
Family Membership (Dues: \$35 per year)
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