The Minuteman Repeater Association

The Minuteman

Volume 34, Number 2 November 2004

President's Corner by Bob DeMattia, K1IW

With winter just around the corner, the ham radio busy season winds down. The spring and fall seasons are full of public service events, with something happening just about every weekend. Club events are better attended due to the generally dry and predictable weather and everyone back from their summer vacations. The cold and unpredictable weather of winter quickly brings this to a halt. Early winter is also a time when everyone starts focusing on the holidays. Who's going to go to whose house for that holiday dinner, party etc? For ham radio clubs, it is a very challenging time of year. Members simply don't have the time for extracurricular activities.

At MMRA, we've tried to address this problem by making our wintertime meetings (November and January) as interesting as possible. I hope you will be able to join us for one or both of them. Our November meeting will be held at the Massachusetts Emergency Management Agency in Framingham, and features a very interesting discussion on the U.S. Air Force's radar system on Cape Cod, called "PAVE-PAWS". This topic is especially relevant to ham radio operators because the system operates on the frequency range from 420 to 450 MHz — that's correct — right on top of the amateur 70 cm band. In fact, the military is the primary user on this band. Amateurs, as secondary users must yield the frequency (including all of our glorious repeaters) should we interfere with their operations. Fortunately for us, the two services peacefully coexist. Our featured speaker, Lew Collins, W1GXT, is a consultant that has done work at the facility and has a very interesting presentation. I hope I will see you there, Wednesday night, November 17th at 7:30 pm.

In other news, many of us have been "lucky" to hear the infamous "buzz-buzz" interference on our 146.61 repeater in Marlborough. What's even more interesting is that this same interference has been heard on 146.955 in Westford, and 147.00 in Dartmouth. Furthermore, I've tuned my 2m AM receiver to 143 MHz in my car and found three other sources that sound like the same thing just driving from home to work. No one seems to know what it is! Can you hear it in your neighborhood? If you have a receiver with AM mode, tune the range from 141 to 153 MHz and listen for a wide-band (500 KHz or greater) buzzing sound - 1 second on, 1 second off. If you hear it, let me know! If you don't have an AM mode receiver, you can often hear the interference with a standard FM receiver, but you have to open the squelch.

Finally, please read the article on MMRA's newest repeater. It operates from the Slygo Hill site on 224.880 MHz. The club is now operating fourteen repeaters and is affiliated with six others. All but a few are currently linkable, and we have plans to make all the FM repeaters linkable by late spring. We are also in early discussions to make our repeater network linkable to neighboring networks in New Hampshire and Rhode Island. Stay tuned to this newsletter for all the details as they become available.

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 maintains a web site at: http://www.mmra.org/

An email distribution list for club members named "MMRA" has been established on: http://www.yahoogroups.com/

MMRA requests that no part of this newsletter be copied or posted elsewhere without prior approval from the club. Your cooperation in this matter is greatly appreciated.

Repeater and Frequency Information

Location	MHz	PL	Call	Note
Bolton	29.620	131.8	W1OJ	Affiliated, FTL
Marlboro	53.810	71.9	W1BRI	PTL
Belmont	145.430	67.0	WA1RTT	Affiliated, 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	N1NOM	FTL
Marlboro	224.880	103.5	W1MRA	FTL (to 10 Meters)
Stoneham	446.725	88.5	N1NVK	NA
Milford	446.825	100.0	WA1QGU	Affiliated, PTL
Brookline	447.875	136.5	K1IW	Affiliated, FTL
Shrewsbury	449.575	88.5	W1BRI	FTL
Belmont	449.650	67.0	WA1RTT	Affiliated, 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 (usually to the Hub).
PTL = Part Time Linked (on schedule or demand).
NA = linking is Not Available.
Additional repeater information is on the MMRA web site.

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 Board Minutes — by Bob Evans, N1BE

The MMRA Board met at 7:00 PM in the offices of Stratus Technologies on October 20th. Present were K1IW, N1QPR, N1VJE, W1DYJ, N1BE, W1JMC, W1NAU, N1NVK and W3EVE. The following items were discussed.

The MMRA corporation annual report was filed with the MA Secretary of State. N1BE provided copies for the President and Secretary.

K1KWP's written Treasurer's report gave details of our funds since the annual meeting and a projection to the end of this fiscal year. We're solvent and due to reduced expenses, able to maintain our finances comparable to the past when there were three times as many MMRA members.

Secretary W1JMC reported 93 renewals have been processed and that about 50 more are outstanding.

K1IW and W1BRI are still investigating the buzzing interference on 146.01. Similar interference has been recently observed by K1IW in other locations and other nearby clubs are reportedly also having a similar problem.

Upcoming meetings were discussed. November at MEMA with W1GXT speaker, January a pizza social, and the March meeting plan is a tour of Hudson Light and Power. The board approved a $100 expenditure for food at the January meeting.

The board requested that bylaw changes suggested by N1BE first be reviewed by an attorney. W1JMC will provide names of MMRA members who indicated that they can help with legal matters; N1BE to follow up with them.

The Fox Box was discussed. Information posted on the box needs to be updated; in particular, a 24-hour cell phone number for a contact person is needed. An information packet for local police should be compiled to explain what it is. Consensus was that a volunteer is needed to come forward to drive these activities to completion. The board passed a motion that the box is not to be used without prior board approval.

Live fox hunts are encouraged, but we need about 4+ participants to make it interesting. N1NVK and N1BE are available and the team of N1QPR and N1VJE will be able to hunt after their boat is closed in November.

Net Manager W1NAU reported that KB1KZI, Jimmy from Quincy, will be TIAOS net control operator on the 3rd Tuesdays of the month. A control op is sought for 2nd Tuesdays.

Creation of a CD of all MMRA newsletters was considered. N1BE has electronic editions since 2001. W1JMC will inventory paper copies in the secretary's files — missing issues will be borrowed from club members. N1BE volunteered to compile the contents, scan paper issues and make a PDF file for each issue. Creation of a searchable index of all articles was also suggested. N1NVL offered to help with CD reproduction, labeling and packaging. N1QPR volunteered to help with CD reproduction and ideas from a similar project he did for NE QRP.

IRLP was on the agenda but not discussed since no one was prepared to present the issue raised by N1BDA.

Repeater affiliation was approved for CPSG's UHF repeater in Belmont, MA. Affiliated repeaters can be linked to the MMRA system, MMRA has a method to disable the link, and the repeater owner agrees to affiliation and listing as such in MMRA publications. K1IW will be contacting W1OJ (10-Meters), N1IMO (NH), and N1JBC (RI) about additional affiliations.

K1IW donated radios and duplexer for a W1MRA 224.88 MHz repeater at MRW. The plan is to share a controller with 147.27; 224.88 would be full time linked to W1OJ 10-Meters and 2-meters would link to the other two during daytime. With a change of link radio frequency, 2-M and 1.25-M could instead link to the MMRA hub.

The board supported the requests by multiple club members to run a "fun" MMRA Field Day event. We agreed to contact Marlboro and request the use of the field at Slygo for the event. The board is seeking a volunteer Field Day coordinator to get a consensus of what types of operation to plan and to organize the activity.

The topic of whether we need equipment insurance led to a round-table about what should the role of MMRA be: Repeater corporation, resource to members who are supporting local events, or something else? Should we look at setting up a high speed digital network from current repeater sites? This could provide email, web pages, VoIP, etc. for emergency communications when the Internet is not available. (See related article by W3EVE.)

MMRA Leaders

President	Bob DeMattia	K1IW
Vice President	Steve Telsey	N1BDA
Secretary	John McGovern	W1JMC
Treasurer	Kevin Paetzold	K1KWP
Clerk	Bob Evans	N1BE
Technical Officer	Bryan Cerqua	W1BRI
Director	Larry Banks	W1DYJ
Director	Tom Muise	W1CDA
Director	Steve Schwarm	W3EVE
Director	Bill Thorpe	WA1NLR
Emergency Coordinator	Bill Northup	N1QPR
Net Manager	Tim Nau	W1NAU
Newsletter Editor	Bob Evans	N1BE
Public Service Coordinator	Kevin Paetzold	K1KWP
VEC Liaison	Bill Wade	K1IJ
Web Page Editor	Bob DeMattia	K1IW

Repeater Report — by Bryan Cerqua, W1BRI

Quincy 2 Meter and 220 repeaters: Thanks to Andy, N1BHI, we have a new 2 Meter GE MASTR II low boy station to replace the previous station that was in poor condition. One of the main motivations for re-building the Quincy repeaters was to implement the new SCOM 7K controller strategy of using one controller for two repeaters and the link radio.

The previous system was in a much smaller cabinet. The new station has plenty of room for both Quincy repeaters, but it lacked an antenna matching board at the power amp output. The matching board was removed from the original station and placed in this new station, a fairly simple job.

The old repeater had the 220 repeater mounted to the rear door of the low boy cabinet making it difficult to service and gain access to the 2 meter repeater. The new station that Andy got for the 147.27 repeater came with a digital modem that was rack mounted. Removing the guts from this rack made a perfect enclosure for the Quincy 220 repeater; the front panel already had holes in it for mounting some LEDs for COR, PLDET, TX and power. The 220 MHz Mirage power amplifier donated by Bill, N1KUG, is also mounted to this rack.

Quincy 220 in new enclosure

I had a nice rack mounted shelf to support the UHF link radio and the interface box for connecting up all the wires. Since the 7K is an older type, it has no LEDs on it. Instead, the LEDs are mounted on the interface box with the appropriate buffering transistors. Microsoft word was used to make a front panel label that was laminated to the front of the interface box. The interface box was by far the most time consuming part of rebuilding the Quincy repeater system; I just kept working away at it a little each night until it was all finished. All audio lines are shielded using RG 174 coax.

Inside the Quincy interface box

I also constructed a small fan control box to turn on the fans for both repeaters anytime one of the PTT lines goes low. This way the fans are not running all the time like in the past. Wheels were installed on the bottom of the rack to make it easy to move the rack around in the small closet space at the repeater site.

GE Test Set

I would like to thank Dick, K1RWS, for donating a like new GE test set that made tuning up this MASTR II station a breeze. This is the first time I ever used one of these test sets; I felt like a real pro using it. In the past I would just use my digital multimeter to poke the test connector.

Since the UHF link radio has two channels, it has crystals for both the hub 449.925 and Stoneham 446.725 frequencies. Having the second channel on 446.725 will allow the Stoneham repeaters to be linked to Quincy without tying up the hub, establishing a mini-network covering much of the coast of Massachusetts. This link will become operational once 88.5 Hz PL tone is added to the Stoneham UHF repeater.

New Quincy rack closeup

I would also like to thank Wayne, N1XXI, his buddy Tim and my nephew Mathew for helping out transporting and installing this new repeater system. Wayne and Tim did a great job mounting an alarm switch to the door. Now the Quincy site, like the Marlboro sites, has a voice alarm that announces over the air that the door is open.

(Continued on page 5)

Minuteman Repeater Association
Quick Membership Renewal

Please use reverse side for new memberships.

(**Renew online** — Use the Member's Login on www.mmra.org)

Name: _____

Callsign: _____

Email: _____

Dues paid (please check one):

☐ Individual Membership (Dues: $25 per year)

☐ Family Membership (Dues: $35 per year)

Do you want to receive the newsletter via email? If so, you'll receive more content earlier.

☐ Check box for Electronic Newsletter: You must supply an email address.

Any other info changed since your last application was filed?

☐ If yes, please check here and please fill in new info on the reverse side.

Please submit completed application forms with your dues
at the MMRA meeting
or mail to:

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

Form Revised: 2003-11-01

Minuteman Repeater Association, Inc.
P.O. Box 669
Stow MA 01775-0669

A Non-Profit Communications Organization Serving the Public in Time of Emergency.

— Membership Form —

☐ **New or** ☐ **Renewal**

☐ **Individual Membership (Dues: $25 per year) or** ☐ **Family Membership (Dues: $35 per year) or** ☐ **Novice Membership (1st year Dues: $10)**

I hereby apply for membership in the MINUTEMAN REPEATER ASSOCIATION, INC. I agree to abide by the rules and regulations of the Association as stated in the bylaws., and understand that acceptance of this application entitles me to all rights and privileges of membership as provided under the bylaws.

☐ **Check box for Electronic Newsletter: Receive more content earlier. Must supply email address.**

Name: _____ **Callsign:** _____ **Class of License:** _____

Address: _____ **Home Phone:** _____

Town, State, Zip: _____ **Work Phone:** _____

Email Address: _____

Occupation: _____ **Employer:** _____

Member of the ARRL? _____ **Other Clubs?** _____

Bands and Modes you operate. Please check all that apply:

	Fixed	Mobile	Portable	FM	DTMF	CW	RTTY	PSK31	APRS	Packet	SSB
HF											
VHF											
UHF											
Satellite											

I can and am willing to assist/serve the Association and/or help maintain the Repeaters in the following ways:

- ☐ **Antennas**
- ☐ **Association Officer**
- ☐ **Board of Directors**
- ☐ **Education**
- ☐ **Emergency Communications**
- ☐ **Equipment Construction**
- ☐ **Equipment Transportation**
- ☐ **Grant Writing**
- ☐ **Legal Aid**
- ☐ **Medical Aid**
- ☐ **Meeting Setup**
- ☐ **Net Control**
- ☐ **Newsletter**
- ☐ **Public Service**
- ☐ **Publicity**
- ☐ **Radio Shelters**
- ☐ **Refreshments**
- ☐ **Repeater Control Operator**
- ☐ **Repeater Technical Committee**
- ☐ **Social Events**
- ☐ **Speaking at a meeting**
- ☐ **Special Projects**
- ☐ **Technical Library**
- ☐ **Web Site**

Other—Please specify:

_____

_____

_____

_____

_____

Other family members:

Name: _____ **Callsign:** _____ **Class of License:** _____

Name: _____ **Callsign:** _____ **Class of License:** _____

Name: _____ **Callsign:** _____ **Class of License:** _____

Name: _____ **Callsign:** _____ **Class of License:** _____

Form Revised: 2002-02-24

Repeater Report (cont.)

(Continued from page 4)

The old Quincy repeater system was fixed up and traded to the Haverhill 146.625 repeater club for a new UHF duplexer to be used in our upcoming 449.925 Motorola Micor repeater. This was a very good deal since we really needed a new duplexer for 449.925 and it helped one of our neighboring clubs.

A few weeks after installing this new repeater, a trip back occurred to adjust the audio levels. Roger, WA1NVC, Bill, N1KUG, and I got to meet the chief engineer and station manager of the WUMB HD radio station that shares the Quincy site with us. If you think we are lacking space in our shelter, you should see the stuff that's crammed into the other side for the HD radio station. The heat from the HD radio power amps is enough to croak you.

The new Quincy 2 meter and 220 repeaters are working better than ever these days. I worked the 2 meter repeater all the way up to North Chelmsford. I can work the 220 repeater from my home in Milford on my VX7 with only 300 mW.

Marlboro East & West Repeater sites: We had a nearby lightning strike that took out one of the audio line cards in the 146.61 base station. This was removed and the audio picked up from an alternate location on the station. The audio line card shouldn't have been used but, once upon a time, this was my first time working on a GE MASTR II station and I didn't realize the other option. The CAS squelch IO was also damaged so I moved over to the RUS signal instead. The SCOM 7K controller also got hung up; Bob, K1IW, and I tried swapping memory chips and mother boards to figure out what was going on. The link radio was dropping out of transmit when both 6 and 2 meters were linked to the hub. Also there was a large AC hum getting into the 6 meter audio path. Actually Bob and I went to the MRE site many times in attempt to recover after this nearby lightning strike.

Tim, W1NAU, and I went up to both Marlboro sites on Sunday October 17th to re-install the 6 meter voter at Slygo, to work on the AC hum on 6 meters and fix the link radio TX dropout problem at MRE. The UHF link frequency for connecting the six meter receive site to the transmit site is now being used for a satellite FM downlink. We figured it would be a good idea to move off this frequency so Bob, K1IW, did the coordination paper work and I ordered and installed new crystals in both the UHF transmitter and receiver.

The AC hum getting into both the 6 and 2 meter stations was solved by plugging in both AC line cords into the same outlet. The link radio is now running on it's own 12V power supply. This solved all problems at the MRE repeater site and the audio sounds clean again. By the way we always had a slight hum on the audio from the MRE link radio but now that it is on it's own supply we have no sign of any AC hum.

Tim and I also swept out the MRE shelter and cleaned up the site. The cabinets were moved to allow easy access to each station. The link radio is now mounted to the side of the '61 cabinet using some very strong disk drive magnets. All the wires for both stations were tie wrapped and dressed neatly. Many thanks to Tim for helping me out.

New 147.27 Repeater update: A custom wiring harness is now complete, I just need to connect about 6 wires to the base station for TX, RX audio, PTT, PLDET etc. The duplexer that we got with this station was pass band only and needed to be converted to pass-reject type. To accomplish this task, six new inserts were ordered from Telewave for $19 each. Also ordered were round metal plugs to cover one of the holes in each cavity. Each can now uses a single port with a tee connector instead of two ports. K1IW ordered interconnecting cables for the cavities from Tessco. For about $300, we have a like-new pass-reject duplexer; if purchased new it would cost the club over $1400. I plan to take the duplexer to work this week for tune-up. Hopefully Telewave told us the correct interconnecting cable lengths, I'll know real soon.

At Hosstraders, for $20, I bought a two channel UHF GE Phoenix radio that hopefully will cover the frequencies for both 449.925 and the 10 meter link. This will allow me to get the new system up and running at home without having to touch the present repeater. The plan is to just swap out the old station cabinet with the new one to minimize the down time.

I still need to install the crystals for 147.27 into the channel elements and build an anti-kerchunk circuit to eliminate key ups due to short bursts of noise when the 10 meter link is active. This new system will also have the new 224.88 repeater wired in. When all is complete we can tie 147.27 and 224.88 to 10 meters or to our network hub on 449.925. The 224.88 repeater is already located at the Slygo site, please give it a try.

I hope to have the new 147.27 system on the air before the snow flies.

New 449.925 Motorola Micor base station: I received the crystals for this station just the other day. Work will start on this project once the 147.27 project is complete. We have a new duplexer for '925 that is tuned up and ready to go, as mentioned above. We also got some TxRx commercial preamps from a rack of stuff donated by Tom, W1CDA,. I plan to try one of these preamps on the new station and see how it works.

Interference problem on 146.61: Many of you have heard a buzzing interference on '61. Bob, K1IW, has been spending most of his free time tracking this down. So far he has located four different locations in new neighborhoods that have this interference. The source of the interference that is bothering '61 is coming from a street just behind the repeater site. The exact source and device remains to be identified. Bob has written letters to the ARRL and the FCC informing them of the locations, frequencies and times this interference is heard. Bob and I have spent a few days and nights chasing this also. We have created a word document with time, frequency and sound files photographed off the clubs service monitor. I will spare the details here since Bob has already sent out email to MMRA members. Once the source is found there will be a write up in the clubs newsletter for sure on it. *[See the MMRA web site for the latest news on this interference — Ed.]*

A High Speed MMRA Network — by Steve Schwarm, W3EVE

At the Board meeting we were discussing what makes the MMRA special. The first thing to come to mind is the great set of linked repeaters that cover a wide area. We are working on plans to connect into other similar networks thus supplying one of the most valuable communications resources in the area.

How can we take advantage of what were have to start a next generation infrastructure? There has been a working group established by the ARRL to look into the use of high speed digital communication on the ham bands. I'd like to have us consider establishing a high speed digital RF network that will allow us to connect the MMRA network together.

As you may know, WiFi operates as a part 15 (unlicensed low power) service on the 2.4GHz band. Some of the frequencies used are on ham bands. We can look into using WiFi access point technology for local access to the network and use something similar to connect the main sites together.

What could we do with the net? Of course it could be used as an internet replacement for emergencies. This could include some VERY limited real access to the Internet, allowing access to sites like the government emergency site, emergency services sites like the Red Cross and other non commercial sites. We could also support echolink, IRLP, and other point to point voice over IP (VoIP) connections. We could add servers so that multi-media email, audio and video conferencing could be supported. It would be neat to sign up for the Boston Marathon online via ham radio. I'm not talking about packet as we know it today but using an online web form at 1 Megabit/second data rates. That would be faster than DSL or Cable modem connections!

How can we create this network? It just so happens that the day after the board meeting my QEX arrived. It has a long article on this very topic. It included some ideas on what to do to establish just such a network. I'd like to hear from others that may be interested to do some initial brain storming on approaches to start on such a project. It is an area of personal interest, but I surely can not to it myself. MMRA has the advantage of some very good repeater locations that could be used as hubs in the network.

I'm interested in what others think. I'd like to put a proposal of the next steps for the next newsletter. I will need some help so anyone interested please feel free to contact me at w3eve@arrl.net.

Last Meeting

Thanks to John Rogers and Dave St.Onge of WGBH for giving us a detailed tour. We saw the new digital TV transmitters and the analog channel 2 and 44 equipment. Everything was on a large scale, feedlines as fat as your thigh, water cooled tubes running 33KV at 1.5A on the plate, and the huge tower.

This was very interesting and enjoyable — many MMRA members want to convey our thanks for the tour!

John Rogers explaining a TV transmitter

K1USN Special Event

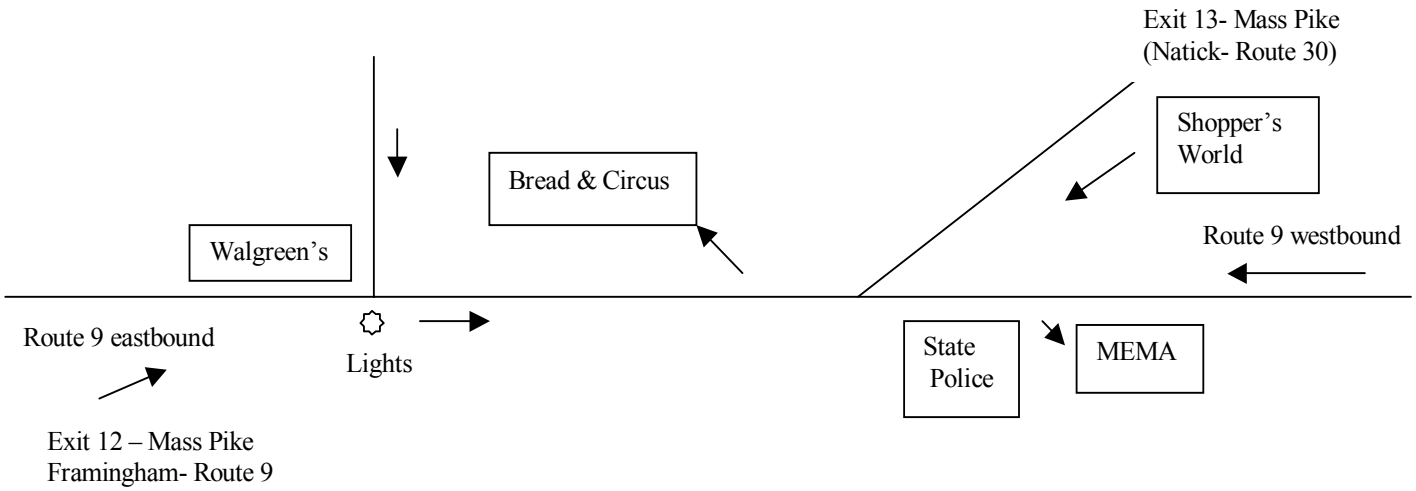
K1USN aboard the USS Salem in Quincy will be active on most amateur bands during Veteran's Day, November 11th. The ship will be open to the public, and all amateur operators.

A special QSL card has been created from the official 2004 Veterans Day Poster. K1USN will QSL all requests received. DX QSL via the W1 Bureau. Stateside QSLs are via: Harold "Pi" Pugh - K1RV, 78 Temple St.. Abington, MA 02351. Please include a S.A.S.E. with QSL requests.

K1USN DX Packet cluster spots will be appreciated.

More info is available on the USS Salem Amateur Radio Club web page: http://www.qsl.net/k1usn

224.88 MMRA's newest repeater



Directions to the MMRA Meeting

We will be meeting at the Massachusetts Emergency Management Agency, 400 Worcester Road (Route 9 eastbound), Framingham, MA. The MEMA telephone is (508) 820-2000. **Please monitor the talk-in on 146.82 in case we must make a last-minute change of plans.**

From the West:

1. Take Mass Pike East to Exit 12 (Framingham Route 9).
2. Travel approximately 2 miles to MA State Police Headquarters on the right, immediately followed by MEMA. (MEMA has several tall communications towers).
3. Enter through the gate.
4. MEMA is underground. Enter building and follow the ramp to the reception desk.

From the East:

1. Take the Mass Pike West to Exit 13 (Natick/Framingham Route 30).
2. Take Route 30 West towards Framingham and drive for approximately 2 miles going through all lights until the end.
3. Take a right onto Route 9 Westbound. (Note that the MEMA communication towers are visible across Route 9 on the eastbound side.)
4. Continue approximately ½ miles on Route 9 Westbound.
5. Turn right into the Bread & Circus parking lot to turn around.
6. Take a left out of Bread & Circus onto Prospect Street.
7. Take a left at the lights heading Eastbound on Route 9. MEMA is approximately 1.5 miles on the right.
8. Enter through gate.
9. MEMA is underground. Enter building and follow ramp to reception desk.

From the South:

1. Take Route 128 (95) North to Route 9 West (Exit 20B).
2. Follow Route 9 for approximately 8 miles. MEMA is on the Eastbound side of Route 9 and is marked by several tall communications towers.
3. Take your next right into the Bread & Circus parking lot to turn around.
4. Take a left out of Bread & Circus onto Prospect Street.
5. Take a left at the lights heading Eastbound on Route 9. MEMA is approximately 1.5 miles on the right.
6. Enter through gate.
7. MEMA is underground. Enter building and follow ramp to reception desk.

From the North:

1. Take Route 93 South to Route 128 (95).
2. Follow above directions, from the South step 2

MMRA's Newest Repeater by Bob DeMattia, K1IW

At its last meeting, the MMRA board voted to accept the donation of a 222 MHz repeater with duplexer. The repeater is currently operating on 224.880 MHz, with standard receive offset, at Slygo under the callsign K1IW. This is the club's fourteenth repeater.

In the near future, it will be coupled to the SCOM 7K controller on the replacement 147.270 repeater, at which time it will change to the club callsign W1MRA. At the same time, the 224.88 repeater will become fulltime linked to the W1OJ affiliated repeater in Bolton.

The 147.270 repeater operates during the day with a link to the W1OJ Bolton repeater. On 29.62 MHz, W1OJ often receives stations from all over the United States and the world! If you hear someone with a southern accent on '27 in the afternoon, they could be headed east on I-40 out of Amarillo!

'27 will continue to be part-time linked from 10AM to 4PM weekdays and 9AM to 7PM weekends. Club members may also change the link status on a temporary basis with the current member codes. If you do not have these codes, contact the club secretary w1jmc@mmra.org..

Next Meeting — Wednesday November 17, 2004
W1GXT: PAVE PAWS RADAR, our 70 cm neighbor

Lew Collins, W1GXT, is an RF consultant who has worked with the PAVE PAWS RADAR system. The Air Force operates these radar systems from several sites, including one as close as Cape Cod.

In addition to physical proximity, this RADAR system is the primary user of the 70 cm frequencies also used by radio amateurs. This proximity is a mixed blessing since we occasionally receive interference, yet it keeps other services from vying to also use 70 cm.

Directions and map are on the previous page and on www.mmra.org.

The meeting will start at 7:30PM.

Please monitor talk-in on 146.820, a last minute change in plans may be necessary if MEMA needs to respond to an emergency or if there is a change in the Homeland Security Threat Advisory Level.

Calendar of Ham Radio Events

Nov 7:	FARA Flea, Framingham MA
Nov 13:	FARA Flea, E. Falmouth MA
Nov 17:	**MMRA meeting @ MEMA**
Dec 15:	**MMRA board meeting**
Dec 31:	**MMRA Newsletter Deadline**
Jan 19:	**MMRA meeting @ UNOs**
Feb 16:	**MMRA board meeting**
Feb 19:	AARC Flea, Marlborough MA
Feb 25:	**MMRA Newsletter Deadline**
Mar 16:	**MMRA meeting @ Hudson L+P**
Apr 29:	**MMRA Newsletter Deadline**
May 18:	**MMRA annual 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!
HTTP://WWW.MMRA.ORG/