



The Minuteman Repeater Association

A non-profit organization providing communications infrastructure and volunteers for community and emergency events.



The Minuteman

Volume 45, Number 3

January 2016

Membership Meeting ~ Wednesday, January 20 ~ 7 PM

Aduino, Raspberry Pi and Radio Applications

Bob Evans, N1BE

Location: The Campion Center, 319 Concord Road, Weston [see page 3 for directions]

Talk-in 147.27

This presentation will cover computer basics and technology changes that led to the construction of single board computers. With that background, we will look at the Arduino and Raspberry Pi; the capabilities of each board and how do they differ; and how you decide if one or the other is more appropriate for a particular application. A demonstration of Arduino programming and discussion of some radio applications for Arduino and Raspberry Pi will conclude the talk. *An Arduino Uno will be given away as a door prize.*

Bob Evans, N1BE was first licensed as WN2EVS in 1972. Since receiving his BS in Computer Science and Engineering, Bob has been employed as an engineer for over 40 years by companies that design and manufacture computers. At home Bob uses multiple Raspberry Pi's for controlling lights, running web cameras, as a video recorder and as a file server. When not pursuing his technical interests, Bob and his wife Anne, N1MPF, enjoy boating, gourmet cooking and wine. (Bob is also the Clerk of the MMRA, a member of the MMRA Board of Directors, and trustee of the Weston 146.790 repeater.)

Note: MMRA bylaws require that anyone who wishes to receive a paper copy of the Newsletter remit an additional \$10 each membership year. Most of those receiving a paper copy **HAVE NOT PAID THIS EXTRA AMOUNT**. Paper copies will no longer be mailed to members who have not paid this additional fee after this fiscal year.

**ARE YOU ONE OF THE
~ 100 MEMBERS WHO
HAVE NOT YET
RENEWED?**

All 2014 memberships expired on August 31st! Renew on the member's login link at www.mmra.org or by U.S. Mail with a check to MMRA, PO Box 669, Stow, MA 01665.

Boston Marathon Announcement

The MMRA is no longer involved in organizing the Boston Marathon. (See the President's Corner on page 3.)

If you are interested in participating, go to:

<http://www.baa.org/races/boston-marathon/event-information/volunteer-information.aspx>

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Band	XMTR Location	Freq	PL	Call	Linking	
					To Hub 1	To Hub 2
MMRA Voice Repeaters						
10m	Marlborough	29.680	131.8	W1MRA	PTL	PTL
6m	Marlborough	53.810	71.9	W1BRI	PTL	PTL
2m	Brookline	145.160	na	K1MRA	D-Star	
	Belmont	145.430	146.2	N1DDK	PTL	FTL: DARI
	Mendon	146.610		AE1C	FTL	PTL
	Quincy	146.670		W1BRI	PTL	PTL
	Burlington	146.715		KC1US	PTL	PTL
	Weston	146.790		N1BE	PTL	PTL
	Boston	146.820		K1BOS	FTL	PTL
	Remote receive in Brookline Boston: PLin = 127.3					
Marlborough	147.270	146.2	W1MRA	PTL	PTL	
1½m	Hopkinton	223.940	103.5	KB1LOY	PTL	FTL
	Quincy	224.400		N1KUG	PTL	FTL
	Weston	224.700		N1NOM	PTL	FTL
	Marlborough	224.880		W1MRA	PTL	FTL
70cm	Lowell	442.250	88.5	K1LVF	FTL	PTL: 446.775
	Weston *	442.700		KG1H	Network Hub 2 (PTL to Hub 1)	
	Burlington	446.775		W1DYJ	FTL	PTL
	Marlborough	448.225	na	W1MRA	D-Star	
	Marlborough	449.575	88.5	W1BRI	PTL	PTL
	Marlborough *	449.925		W1MRA	Network Hub 1	
33cm	Boston *	927.0625	D244	K1RJZ	PTL	PTL
	Marlborough *	927.700		W1MRA	PTL	PTL
PL out = 131.8						
Marlborough		144.390	none	W1MRA	APRS Digipeater	
???		145.630	146.2	W1MRA	Fox Box	
*Internet	HUB1— 449.925: IRLP node 4133 / Echolink node 4133					
	HUB2 — 442.700: IRLP node 4136; Connected to 220 Reflector 9124 on Tuesdays					
	927.0625: IRLP 4977		Normally linked to the NE900 Reflector, 9125. Linked to MMRA via IRLP for the TIAOS net. Normally linked			
	927.700: IRLP 4978					
Notes: FTL = Full Time Linked (or default state) PTL = Part Time Linked (on schedule or demand)						

President's Corner ~ Bob DeMattia ~ K1IW

MMRA and the Boston Marathon

Prior to 2004, the amateur radio effort at the Boston Marathon was organized by three individuals. Although the individuals communicated with each other, they worked fairly independently. In 2004, a consortium was organized between MMRA, Framingham Amateur Radio Association, and Boston Amateur Radio Club to consolidate the effort. MMRA took the lead role. Over the next ten years, we saw the voluntary departure of Boston Amateur Radio Club from the consortium and the addition of other clubs. However the general operation remained more or less the same. The consortium remained in place until last year when BAA chose to form a committee of amateur radio operators to run the effort.

Earlier this month, I stated the MMRA position on this in an email to all BAA volunteers. It would be worthy to reprint that email, so here goes:

As you may have seen in an earlier email from BAA, for 2016 the BAA communications committee will be performing all the planning and execution functions associated with the amateur radio volunteer effort. As such, MMRA will not be involved in any pre-race activities. Please direct any questions you may have to the BAA committee directly. MMRA will still support the BAA committee efforts in whatever ways we are needed - for example - supplying repeaters for use during the event. The MMRA board wishes the BAA committee the best in their new endeavor.

There has been some public expression of negative sentiment toward this change. In particular, the undiplomatic way in which this was done led to negative feelings among some key individuals. Regardless of past mistakes, the new organization is likely to remain in place. The public service opportunity afforded by the marathon is still a boon to our hobby. As such, it is time to put away the past and move forward. MMRA fully supports the efforts of the new committee. As I stated in my email, the MMRA board wishes the committee success and we encourage our volunteers to participate and support the effort.

Directions to the Campion Center

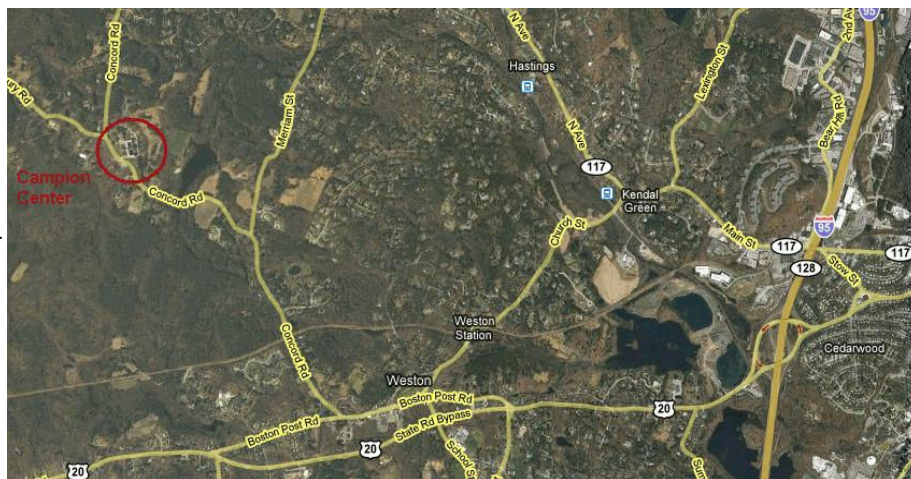
From Route 128 (I-95):

From Route 128 (I-95) in Waltham, take the Route 20 exit and head west to the town of Weston. At the first major intersection, turn RIGHT on to Boston Post Road. Drive straight through the town center. After the center, turn right on to Concord Road. Then see below.

From Route 20 heading East towards Weston:

Head East on Route 20. After entering Weston on Route 20 bear left onto Boston Post Road. From Boston Post Road turn left onto Concord Road.

The **Campion Center** is on Concord Road. However, before you get to it, there will be a fork on Concord Road where Concord road takes a turn to the left. You will find Campion a short distance after the fork. It will be a large building, with a dome, on your right.



MMRA Hopkinton Site Visit ~ 223.940MHz. James Cahill, KB1LOY and Bryan Cerqua ~ W1BRI

Bryan Cerqua, W1BRI, and James Cahill, KB1LOY, visited the Hopkinton Repeater site on 25 September, 2015, to conduct routine inspection and maintenance. Access to the site is restricted and requires an appointment for all visitors. Upon arrival we were given access into the shelter where the repeater was found to be functioning but not putting out the intended power. We immediately noticed that new ceiling tiles were installed by the shelter host since our last visit.

ANTENNA PROPERLY TUNED

Feedlines, grounding, and power cables were visually inspected and appeared in order. The repeater was opened, visually inspected and tested. The transmit SWR was measured using Bryan's new toy: the MFJ-226, 1-230 MHz antenna Expert Times Graphic Analyzer and found to be a respectable 1.33:1 (optimum frequency measured to be 224.31 @ SWR of 1.09:1). Feedlines from the shelter to the tower were inspected, found in order and without issues.

OUTPUT POWER DISCOVERED EXTREMELY LOW, CORRECTED WITH TEMP CABLE

The output power to the antenna was tested with the Bird Watt Meter and found extremely low, less than 1 watt. Investigating further, the input to the RF Concepts Amplifier was measured to be acceptable at 6 watts. The output of the amplifier was acceptable at 58 watts. The duplexer output cable to the antenna was removed and when replaced with a temporary jumper the power output was measured to be a reasonable 42 watts. The existing output cable was removed from service and a temporary cable was left in place. The end connections of the non-performing cable were suspect and brought back to W1BRI's shop for reworking. The final observation was the supply current at 17.5 Amps. A follow-up visit will be scheduled to return the cable to service.

CEILING TILE REPLACEMENT, BAD NEWS => GOOD NEWS

Comparing the 2014 pictures to the 2015 pictures, it appears the cabinet and duplexers were moved around. The loose connections likely are related to the ceiling tile replacement work done inside the shelter. However, the good news is that comparing the ceiling from 2014 to 2015 there is great improvement to the shelter environment and there was no cost to the MMRA.

We noted the SCOM 7K repeater controller appeared to function properly. The shelter was then secured.

Respectfully submitted,
Bryan, W1BRI and James, KB1LOY



**2014
repeater/
duplexer
positions**



**2015
repeater/
duplexer
positions**



**2014
ceiling
view**



**2015
ceiling
view**

Boston 900 Repair Trip ~ Roger Coulson, WA1NVC

John, K1BOS, Randy, N3HFK, and Steve, KC1HO, met Dave (WCVB's contact person) at 11:00 AM on 28 Nov, 2015 at the Boston 900 MHz repeater site. K1BOS, organized the work party. Both the low power and high power PA's in the MSF5000 repeater were replaced. The high power PA is definitely bad.

At 1:00 pm the crew determined that the forward and reflected power sampler in the repeater was also bad.

Roger, WA1NVC removed the power sampler from his backup 900 MHz repeater, drove into Boston, delivered the part, and returned home to continue assisting with the repair remotely.

Steve, KC1HO, supplied a new PiRLP node that he was about to install on the 145.39 repeater. The first problem was the audio was too loud coming out of the Scm 7K controller and could not be adjusted low enough on the PiRLP. With remote assistance from Roger, WA1NVC, Randy, N3HFK, located the Scm 7K output pot for IRLP was found to be set at maximum. Randy, N3HFK, changed this to the mid point and Steve, KC1HO, was then able to complete the standard IRLP audio setup.

There was a problem with constant beeping on the IRLP audio. After a lot of troubleshooting, it was determined to be a bad ground connection between the PiRLP and the MSF5000.

The audio levels were observed remotely on the service monitor by WA1NVC. Tests were made on the Near-900 net using the Marlboro, Marshfield, Cumberland, Barnstable, and Warwick repeaters. The levels and operation seemed just fine. The cause of the repeater failures was not obvious but WCVB reported that there was a lightning strike back in September.

Steve, KC1HO, took the old IRLP board home so he can continue with the 145.39 PiRLP project. The MMRA has purchased and replaced the parts

Steve, KC1HO, used to make the new PiRLP node.

John, K1BOS, has returned to Weston the power supply that was not needed, the two PA's of which the high power unit is known bad, and the old IRLP computer.

Randy, N3HFK, has provided a replacement forward and reflected power sampler to WA1NVC.

The PiRLP has worked out so well that at the last board meeting, K1IW, proposed that the MMRA replace the 4133 and 4978 IRLP nodes using old computers with PiRLP nodes. There are no plans to replace 4136 at this time.

Thanks go to John, K1BOS, for organizing the Boston 900 MHz repeater repair operation and providing the pizza.

The Amateur's Code

The Radio Amateur is:

CONSIDERATE...never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL...offers loyalty, encouragement and support to other amateurs, local clubs, and the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE...with knowledge abreast of science, a well-built and efficient station and operation above reproach.

FRIENDLY...slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for the interests of others. These are the hallmarks of the amateur spirit.

BALANCED...radio is an avocation, never interfering with duties owed to family, job, school or community.

PATRIOTIC...station and skill always ready for service to country and community.

Paul M. Segal, W9EEA, 1928

Mike Neilsen, W1MPN, will lead FY'16 budget process.

Mike, W1MPN, will lead the development of a budget for the next fiscal year. If you are interested in being involved in this task, please contact him at w1mpn@mmra.org or w1mpn@comcast.net

December Business Meeting

Bob Evans, Clerk, N1BE

The MMRA board met for a business meeting in Northborough at 7:30 PM on Dec 16 in Northborough. In attendance were K1KWP, N1DDK, W1DYJ, N1BE, WA1NVC, KG1H, W1MPN, N1BDA, N1NVK and K1IW who hosted the meeting. ***(Thanks Bob and Joyce for the great food and hospitality!)***

The first agenda item was a Treasurer's Report by K1KWP reviewing income, expenses and balances. Kevin noted that we are sending paper newsletters to a few members who have not paid the \$10 necessary to defray the costs associated with paper mailings. K1KWP also reviewed counts of members that have renewed or not. There are a hundred dues paying members that have not yet renewed by paying dues for the current membership year that began on Sept 1.

K1IW gave a repeater report as follows.

- ♦ The Boston 900 MHz IRLP node was replaced by a Raspberry Pi based node for less than \$150. The board approved an expenditure of up to \$250 to build a Raspberry Pi based replacement for the old and power hungry 4133 & 4978 nodes.
- ♦ Bob then discussed negotiations on a new contract for leasing space in the Kinder Morgan Hopkinton site. One concern is that the MMRA would have insurance that the landlord requires. The board approved an annual incremental expenditure of \$350 for Worker's Compensation, employee and vehicle insurance. This insurance will cover the MMRA at all sites, not just at Hopkinton.
- ♦ Bob next discussed the benefit of Internet connectivity to the remaining five MMRA repeater sites that do not yet have it (Marlborough East, Burlington, Hopkinton Quincy and Lowell). After a small expenditure of about \$50 per site, connectivity can be free for the first 500 megabytes each month. This would be sufficient for control purposes although we might need to add a board to the some 7K repeater controllers to add a serial port. The board approved

an up to \$100 expenditure to purchase one Raspberry Pi and the modem necessary for this connectivity at one site. After experimenting with this prototype, we will consider whether to deploy at the not presently connected sites. (This connection method uses a *Freedompop* U770 USB LTE modem).

W1DYJ re-opened a discussion of the proposal to affiliate with NEAR (New England Amateur Radio, Inc.). NEAR is an organization to promote Amateur Radio as an educational STEM activity. W1DYJ and N1DDK have a tentatively approved affiliation agreement with the MMRA. The MMRA board has a week to review and comment on this agreement and send comments back to W1DYJ, with the intent that K1IW would sign after this comment period and forward back to NEAR, Inc.

W1DYJ reports that Burlington 440 audio is distorted. K1IW suggested that he check to see if the transmitter is off frequency.

W1MPN is still looking for a volunteer from the membership to help draw up a budget for the next MMRA fiscal year.

The board approved a proposal that K1IW arrange for the MMRA to take possession of equipment from the shack of W1JDO (SK). This may occur the week of the January meeting. If so, we may have a mini flea market at that time.

The meeting adjourned at 9:10 PM.

**Next MMRA Business Meeting:
Wednesday 17 February, 7PM
Stratus, Maynard**

Upcoming MMRA Meetings

Wed, 23 Sept ~ Membership Meeting
The Greatest Hobby in the World ~ Rick Roderick, K5UR
Northborough Public Library

Wed, 21 Oct ~ Business Meeting
Stratus, Maynard

Wed, 18 Nov ~ Membership Meeting
New Approaches to VHF/UHF Frequency Sharing ~ Lee Lemoine, N3LEE
Holiday Inn, Boxborough

Wed, 16 Dec ~ Business Meeting
Stratus, Maynard

Wed, 20 Jan ~ Membership Meeting
Aduino, Raspberry Pi and Radio Applications
Bob Evans, N1BE
Clay Center, Brookline

Wed, 17 Feb ~ Business Meeting
Stratus, Maynard

Wed, 16 Mar ~ Membership Meeting
Antenna Modeling, It's Easier than (re) Building Them ~ Larry Banks,
W1DYJ
TBD

Wed, 20 Apr ~ Business Meeting
Stratus, Maynard

Wed, 18 May ~ Membership Meeting
Programming Your Radio with CHIRP ~ James Lee N1DDK
and Annual Meeting: Officers Report and General Elections
Campion Center, Weston

Wed, 15 June ~ Business Meeting
Stratus, Maynard

Saturday, 27 Aug ~ Mid-summer Get Together
Boxboro ARRL Convention
Holiday Inn, Boxborough

Don't Forget! Join Us.

Every Tuesday @ 8 PM
Technical, Informational and Other
Stuff Net

The MMRA's repeaters are linked Tuesday nights for the TIOS Net. Keep up with what's happening in the MMRA and ask your ham related questions.

Net Control Operators:

Week 1	WA1JIM	Jimmy Devaire
Week 2	W1DYJ	Larry Banks
Week 3	KC1CLA	Ed Curley
Week 4	K1KWP	Kevin Paetzold
Week 5	KB1OQA	Tom Turner

To connect using Echolink / IRLP during the Net:

- Echolink Conference *NEW-ENG2*
- IRLP node 4133

MMRA Leaders

Officers

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

Board of Directors

Director »2017	Steve Schwarm	W3EVE
Director »2017	Roger Coulson	WA1NVC
Director »2016	Clark Conti	N1NVK
Director »2016	Mike Neilsen	W1MPN

Repeater Trustees

* Belmont 145.430	James Lee	N1DDK
* Boston 927.0625	Rick Zach	K1RJZ
* Boston 146.820	John Mullaney	K1BOS
* Brookline 145.160	Joyce DeMattia	N1QPH
* Brookline 146.820 Rcvr	Bob Phinney	K5TEC
* Burlington 146.715	Bruce Pigott	KC1US
* Burlington 446.775	Larry Banks	W1DYJ
* Hopkinton 223.940	James Cahill	KB1LOY
* Lowell 442.250	Vince De La Flor	K1LVF
* Marlborough 53.810, 449.575; Quincy 146.670;	Bryan Cerqua	W1BRI
* Marlborough: 29.68, 144.390, 147.270, 224.880, 448.225, 449.925, 927.700 — all as W1MRA		
	Bill Northup	N1QPR
* Mendon 146.610	Jim Podsiadlo	AE1C
* Quincy 224.40	Bill Dunn	N1KUG
* Weston 146.790	Bob Evans	N1BE
* Weston 224.700	Eddie Mulhern	N1NOM
* Weston 442.700	David Wolfe	KG1H

Additional, non-Voting

* Newsletter Editor	Larry Banks	W1DYJ
* Emerg. Coord.	Kevin Paetzold	K1KWP
* Pub. Serv. Coord.	David Wolfe	KG1H
* VEC Liaison	Bill Wade	K1IJ
* Net Manager	Larry Banks	W1DYJ
* Web Page Editor	Bob DeMattia	K1IW

* Appointed

Previous issues of the MMRA Newsletter are available at:
www.mmra.org → [Newsletter Archive](#) (on the left)

MMRA VE Sessions

Third Saturday

9 AM at the Marlboro Public Library

Contact: Bill Wade, K1IJ 781-891-9079
Evenings 6 - 10 PM Weekends 8 AM to 10 PM.
Accredited by the ARRL VEC

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Aduino, Raspberry Pi and Radio Applications

Bob Evans, N1BE

Talk-in 147.27

Calendar of Ham Radio Flea Markets

For more information: <http://mit.edu/w1gsl/Public/ne-fleas>

6 Feb	Springfield VT	CVFMA.org @VFW
13 Feb	Marlboro MA	AARC @MS
27 Feb	S Burlington VT	RANV @HI
28 Feb	Hicksville NY	LIMARC @LevitHall
5 Mar	Chicopee MA	MtTomARA @MooseLodge
6 Mar	Westford MA	@Regency
19 Mar	Dayville CT E	CARA @StJosephCh
20 Mar	Southington CT	@HS
25,26 Mar	Lewiston ME	AARC ME Conv @Ramada
10 Ap	Framingham MA	FARA @KeefeTech
16 Apr	Gails Ferry CT	RASON Auction
17 Apr	Cambridge MA	Flea at MIT

29,30 Apr	Deerfield NH	NEARfest XIX @FG
14 May	E Greenbush NY	EGARA @FireCo
15 May	Cambridge MA	Flea at MIT
4 Jun	Hermon ME	PSARA @8 @HS
19 Jun	Cambridge	MA Flea at MIT
17 Jul	Cambridge	MA Flea at MIT
13 Aug	St Albans VT	STARC @VFW
21 Aug	Cambridge MA	Flea at MIT
26,28 Aug	Boxboro MA	FEMARA NE Conv
28 Aug	Adams MA	NoBARC @BoweFld
17 Sep	Forestdale RI	RIAFMRS @VFW
18 Sep	Cambridge MA	Flea at MIT

THE MINUTEMAN REPEATER ASSOCIATION

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

Email: contact@mmra.org



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

**Have you renewed your
membership yet?**

All 2014 memberships expired on August 31st!
Time to renew either on the Member's login link
at www.mmra.org or by U.S. Mail with a check