



The Minuteman Repeater Association

The Minuteman

Volume 34, Number 3

January 2005



MMRA News Summary

The big news this month is the cause of the infamous 2-Meter **"buzz-buzz"** was located due to months of dedicated effort by K1IW with assistance from W1BRI. Bob's preoccupation with this interference led the discovery — a real boon as the problem is wide spread and also affects VHF high band public service frequencies. It's amazing what problems result from fast, high gain devices in a poorly designed circuit.

Larry, W1DYJ, is organizing an MMRA team effort in the ARRL January VHF Sweepstakes. VHF/UHF contests are more relaxed and friendly than ones on HF. If you have a sideband or CW capability on VHF/UHF, consider adding your score to the MMRA total.

On Saturday, February 19th, the Algonquin ARC will use the MMRA hub and default linked repeaters for flea market talk-in. Although the repeaters will still be available for ordinary use, please allow AARC access as needed.

Meanwhile, MMRA will be at the Algonquin flea market in the Marlborough Middle School. Stop by and visit our table!

If your membership has not been renewed since Sept, your dues are overdue. The board is considering changing codes so that only current members will have access.

MMRA Board Minutes — by Bob Evans, N1BE

The MMRA Board met at 7:30 PM in the Horseshoe Pub, Hudson MA on December 15th. Present were K1IW, W3EVE, K1KWP, N1BDA, N1NVK, W1BRI, N1QPR, N1VJE and N1BE. The following items were discussed.

ARES nets, which use MMRA repeaters all linked, are moving to monthly first/second Monday nights after RACES. To better simulate an emergency, the repeaters will not automatically link up for ARES nets.

It was decided to send a letter to those who have not renewed their membership.

K1KWP's Treasurer's report projects a small increase in our balance over the entire fiscal year. At the previous board meeting, a loss of about \$500 was projected.

The board approved use of a table at the Algonquin flea to sell excess MMRA equipment.

W1BRI led a discussion of repeater status and user access code change on Jan 1:

- The replacement of 147.27 radios, controller, and duplexer is almost ready. (See Nov 2004 repeater report.)

- The new '27 will not have battery backup because it not feasible to run without the PA when utility power is absent.
- The board approved sale of the current duplexers and RC-850 controller. The Micor radio from '27 will be redeployed for our APRS station at MRW, allowing return of the APRS HTX-212 to N1QPR.
- Bryan is dissatisfied with 449.925 receiver performance.

Finally, W3EVE and K1IW discussed the opportunity to serve the BAA by coordinating communications for the Boston Marathon course. This will be decided by membership vote at the January meeting. Note that volunteers are needed for communications regardless of whether the MMRA coordinates.

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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 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
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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.

President's Corner — by Bob DeMattia, K1IW

"The MMRA is a non-profit communications organization serving the public in time of emergency". That is a subtitle that you sometimes see under the MMRA logo. It also appears at the top of our "About MMRA" web page. Historically, MMRA service has primarily been the provision of repeaters used for events such as the Walk for Hunger and Boston Marathon, ARES drills, and in some cases for emergencies such as hurricanes. This month, the MMRA has the opportunity to take an additional step: MMRA is being asked to co-sponsor the amateur radio communications effort for the Boston Marathon. The Framingham Amateur Radio Association (FARA), and the Boston Amateur Radio Club (BARC) are also being asked to participate.

What this means for MMRA is that the club will provide one or two "Project Managers" to handle various aspects of the

event. In return the club's name will be associated with the effort, garnering publicity for the club.

This undertaking is not without its risks. If we don't plan and execute properly, there are many pitfalls we can trip over. However, I believe the benefits we would provide to the general population, and well has the resulting publicity, is good for everyone — the public, amateur radio, and of course our club, far outweigh any "disasters" we might incur.

The club will have a general discussion and vote on this issue at our Meeting on January 15th. Your comments are invited. Also, if you would like to take a direct role in the pre-event effort, please contact me by email k1iw@mmra.org, or speak to me at the meeting. Aside from a meeting or two, the majority of the pre-event activity can be done from the comfort of your own home.

Join the MMRA VHF Contest Effort — by Larry Banks, W1DYJ

Some of us like to get involved in contesting. I do, especially the VHF contests. These contests are mostly on SSB and CW. There are very few on FM.

We have an opportunity to generate some publicity for the MMRA — we can enter the January VHF contest as a club! You operate from your home as you normally do, and send in your scores as usual — no change to your usual routine. Then we aggregate our scores to enter as a club. It's simple — we just mention the club in our contest entry to the ARRL. Scores really don't make much difference, no matter what score you earn, it all adds up. (If you are entering with another club, you can't enter with the MMRA. But then, who is more important, the N.E.W.S. group? YCCC? or MMRA!)

The VHF contest starts at 2 PM EST on 22 January 2005 and ends at 11 PM on 23 January. If there are at least two other MMRA members who are going to be in this contest and will send in their scores, I am willing to do the organizing. What do we get? The Club name in QST. (Only members "in good standing" can be involved, so if you like this idea, and haven't paid your dues, here is a good reason to do so.)

I am also willing to spend some time with you to help you get into contesting -- it's really easy on VHF! If you are interested, please reply to me at w1dyj@mmra.org

[More info about this contest is on page 104, December 2004 QST. Rules and forms are posted on www.arrl.org at: Operating Activities → Contests → Rules → January VHF Sweepstakes — Ed.]

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

New 147.27 Repeater update: I finished the new 147.27 repeater but won't have a write up until it gets installed at Slygo. I expect to have a lot to say about this system, the link radio anti-kerchunker filter and the duplexer conversions. I plan to install it the weekend of Jan 8th; hopefully the weather will cooperate.

Shrewsbury: Kevin, K1KWP, and I worked all day long on 449.575 on Tuesday December 28th. I found the exciter to be creating all kinds of spurs when feeding the PA. Apparently, a problem all along with 575 was strong out of band spurs killing the receiver, getting right thru the duplexer. We need to add a filter between the exciter output and PA input. Just adding a BNC elbow connector cleaned up the whole mess, maybe due to length change or extra capacitance. With the elbow it was very clean and Kevin could get into the repeater with 50 mW from his QTH.

But something happened to it the next day, On Wednesday, 575 wasn't not putting out the rated power and not hearing well. I did add a pig tail connector with N connectors on it for the antenna to duplexer tie. Maybe something happened to it. I'm pretty sure I can fix this repeater so it works correctly, when I get back to the site.

146.61 Buzz-Buzz: I wrote up a document that I sent the FCC and the ARRL about the source and cure of the 146.61 Buzz Buzz. Bob, K1IW purchased Motorola cordless extension handsets and discovered that the handset cradle battery charger is the interference source. He gave me one of the chargers and I modified it so it doesn't create the buzz buzz.

I did the technical side of it but Bob deserves the credit for all the email that he got about it, plus how much time we spent looking for it. Bob is going to modify the remaining chargers that he has and swap one with the guy on Robert Rd who was causing the '61 problem.

“Buzz-Buzz” Interference Resolved — by Bob DeMattia, K1IW

As many of you are aware, the '61 repeater has been affected by an odd interference pattern since early spring of last year. The interference was a 2 second on, 1 second off buzzing noise that would go continue for sometimes hours, sometimes days, sometimes weeks at a time. There were also times when it would disappear for hours, days, or weeks. Needless to say, many hours, days, and weeks were spent tracking the source of this interference! It was found to be emanating from the vicinity of a house in a residential neighborhood about ¼ mile from the repeater. Although we got this far, the cooperation of the homeowner was limited and we were not able to determine what in the home was actually causing the interference.

At the time that we were investigating this, we noticed one other detail which turned out to be quite important. A similar sounding interference, though weaker in strength, was coming out of another home in the same neighborhood. This led to the suspicion that perhaps it was some sort of utility problem. We reported the interference to all three utility companies, cable, telephone, and power. Each visited the neighborhood, but none could find any problems.

As things developed, I discovered additional sources of this strange interference. There were a total of six homes identified, three in Marlborough and three in Northborough, all with the same type of interference. Although the interference was similar in nature, each source appeared to be on different frequencies, but all were in the range of 141 to 152 MHz.

One of the last homes discovered turned out to be a neighbor of mine in the same neighborhood. I paid him a visit one day and he was very cooperative. Inside his home, the signal was more of a continuous buzz than intermittent. We disconnected power to each circuit in his home one at a time. One circuit in the kitchen changed the nature of the interfer-

House #	Frequency Range
1	144.5 – 146.5
2	142.5 – 143.5
3	142.5 – 143.5
4	142.5 – 143.5
5	151.5 – 152.5
6	144.5 – 146.5

Interference Sources

ence from the constant buzz back to the intermittent one. In the kitchen, we found that a cordless phone charger was causing the interference. When the phone was removed from the cradle, the noise would stop. Return the phone and it started again. The constant buzz was in the same frequency range as the intermittent one, but the whole time we could still hear the intermittent one in the background – even with the power completely turned off in his house. My suspicion was there was a second source of interference, perhaps in the next house over or elsewhere nearby. Since it was impracticable to shut down power in multiple homes at the same time, I took note of the phone model number and other information, thanked my neighbor, and went home.

Not much progress was made for several weeks after this – until providence stepped in. Amazon.com was having a sale on the accessory handset for my own cordless phone. When the handset arrived, I placed the remote charger on my desk, thinking nothing of it. Later in the day, I went to check on the local sources of the interference as I had been doing for some-

(Continued on page 5)

“Buzz-Buzz” Interference Resolved (cont.)



Motorola handset in its charger. The UL number on the bottom applies to several VTech cordless phone models.

(Continued from page 4)

time in an attempt to establish a pattern. As I listened to the noise on my receiver, the cordless phone caught my eye and something clicked. While my cooperative neighbor had a V-Tech phone, two of the other homes I had visited had the same model of Motorola

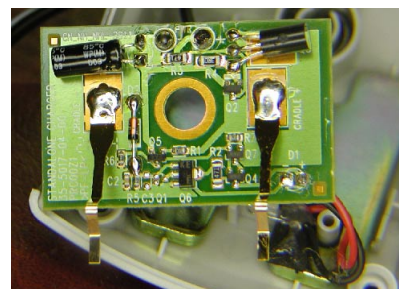
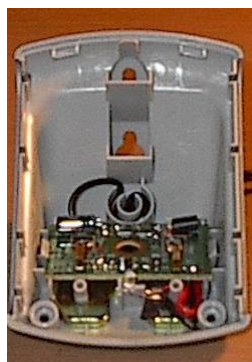
phone that I owned. I already had lower expectation of this as a source, since I had held my receiver right up against the base unit at both homes and found nothing. Besides, I had the phone myself and there was no interference coming out of my house. Anyhow, I wondered if the remote charging unit was the problem, as it was at my neighbor's house. If so, then my new purchase should have created a new interference source on a different frequency. I swept my receiver from 108 MHz going upwards. BINGO! From 162 to 168 MHz was a loud, continuous, previously undiscovered buzz. I removed the handset from its cradle and it stopped!

I informed Bryan of the discovery. He quickly made arrangements to retrieve a charger from me. Off to his workshop it went, and within four hours he had found the problem and created a solution! **There was a parasitic oscillation, tuned by the junction capacitance of the charging indicator LED and the leads that connect it to the circuit board.** Putting a 470-ohm resistor in series with the LED lowers the Q of the circuit and prevents the interference. *[See schematic diagram by W1BRI on the next page — Ed.]*

I made calls to the two homes that had the Motorola phones and both indicated they had accessory handsets. One of them is close enough to my house that I can hear it on my receiver. While I was on the phone with him, he removed his extension from the charger and the noise stopped! The second home was the original problem that was getting into our repeater. This person has purchased a second charger and will replace the original with it. If this solves the problem, he will let us modify the older one (which is now out of warranty).

Due to its source, this interference may occur again and again in different areas. The ARRL is going to report the problem to Motorola and it will hopefully be fixed in future production units. The ones that are already in use will have to be dealt with on a case-by-case basis.

Continuous vs. intermittent: the noise is continuous when the battery is charging. Once the charger goes into



Above and on left shows inside of the charger. Heavy red and black wires on lower right go to the LED.



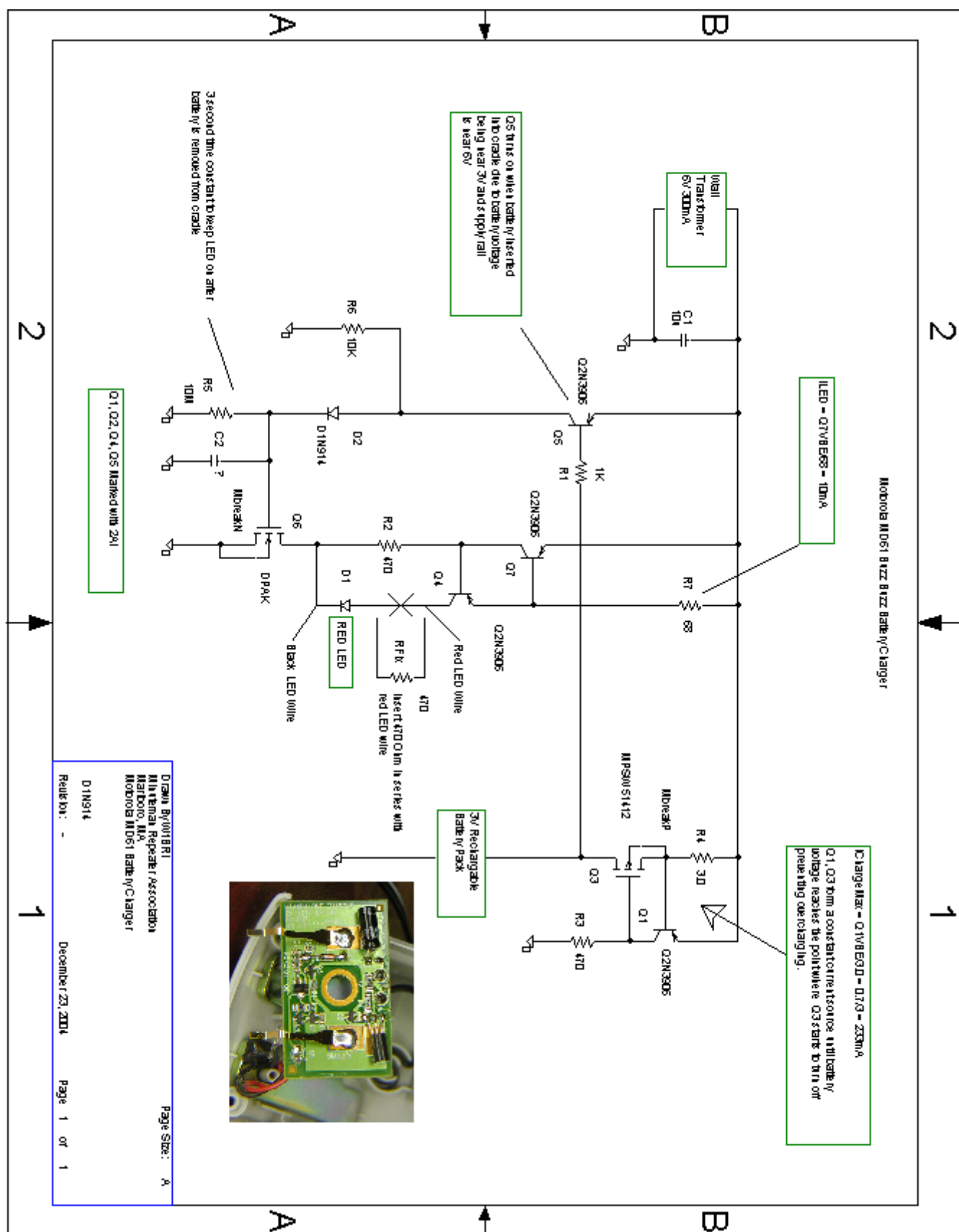
Below is the charger after modification.



trickle charge mode, the buzz establishes the 2-second on 1-second off pattern. After many hours in this state, the spectrum of the interference changes. At my house, when a phone is initially placed in the charger, the range is strictly from 162 – 168. If the phone is left undisturbed overnight, it will begin interfering with reception of television channel 7, which is at 174 – 180 MHz. If I remove the phone from the cradle, even for an instant, the spectrum reverts back to the lower range.

The interference on '61 should now be gone. If you hear a recurrence of this problem, please notify me or Bryan Cerqua.

“Buzz-Buzz” Interference Resolved (cont.)



Public Service Volunteer Opportunities in the New England Division

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.

The most up-to-date copy of this list is maintained as <http://purl.org/hamradio/publicservice/nediv>

Every event listed is looking for communications volunteers.

<u>Date</u>	<u>Location</u>	<u>Event</u>	<u>Contact</u>	<u>Tel/Email</u>
Dec 4	Sutton	MA Festival of Lights	Bob KA1OTQ	508-865-6957 ka1otq@arrl.net
Feb 5	Pelham	NH Boy Scout Klondike Derby	Bill AB1AV	603-465-7396 william.Noyce@hp.com

This list is published periodically as demand warrants by Stan, KD1LE, and Ralph, KD1SM. Our usual distribution is via packet to NEBBS, via Internet mail to the arrl-nediv-list and ema-arrl distribution lists, and on the World Wide Web (see URL above). If other mailing list owners wish us to distribute via their lists we will be happy to oblige. Permission is herewith granted to republish this list in its entirety provided credit is given to the authors and the URL below is included. Send comments, corrections, and updates to:

(via packet) KD1SM@K1UGM.#EMA.MA.USA,

(via Internet) KD1SM@ARRL.NET.

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.

Refer to <http://purl.org/hamradio/publicservice/nediv> for the most recent version of the PSLIST. AR

Concord MA Ham Radio class in February/March

The Colonial Wireless Association will be holding an Amateur Radio training course through Concord Carlisle Adult Education. This class will prepare students to take the Technician licensing exam, to be administered on the last night of the course. There is no Morse Code requirement for this license.

This course will be taught by Concord and Acton hams. Classes will be held in four sessions on consecutive Tuesdays and Thursdays on February 15, 17, March 1 and 3 at 7 PM. The class will be taught at Concord-Carlisle High School, 500

Walden St, Concord MA. The cost is \$30, plus \$14 to take the exam. Register through Concord Carlisle Adult Education at 978-318-1432 or via <http://ace.colonial.net/default.html>.

Currently-licensed hams who wish to take higher-level exams to upgrade their licenses may do so at the test period during the last class with prior notification to the instructors.

For more information, contact Fred Harrington at 978-371-9818 or harrington.email@comcast.net.

Web Sites of Interest

A frequency chart poster that we saw on display at the WGBH transmitter can be downloaded from:

http://www.cedmagazine.com/ced/2004/0704/0704_fa_chart.pdf

N2VKG's a big collection of ham radio and scanner links:

<http://www.panix.com/~clay/ham/>

<http://www.panix.com/~clay/scanning/>

N1MNX provided these tower and history related links:

<http://www.bostonradio.org/>

<http://www.manfrommars.com/wfeatowers.html>

<http://www.hawkins.pair.com/blaw-knox.html>

<http://www.qsl.net/w2xmn/Pages/antennafarm.html>

<http://www.fybush.com/sites/2004/site-040205.html>

<http://www.rwonline.com/reference-room/special-report/rwf-armstrong1.shtml>

<http://www.tvtechnology.com/features/news/n-armstrong.shtml>

<http://hawkins.pair.com/wor-tv-NBergenNJ.html>

http://www.geosnapper.com/view.php?coll_id=238&wyp_id=1931

Next Meeting — Wednesday January 19, 2005

Social at Newton Pizzeria Uno

MMRA is sponsoring a post-Holiday Pizza Party at Pizzeria Uno Chicago Grill, One Newton Place, 287 Washington Street in Newton. Come and enjoy some pizza with us, MMRA-style!

We will discuss and vote on MMRA support of the Boston Marathon.

At this meeting, the MMRA service monitor will be available to check-out your HT. Bob, K1IW, will also bring the MMRA "demo" repeater. You can use it to try the MMRA linking/unlinking commands without having to be on the air!

Directions and a map are available on the www.mmra.org web site. There is a parking lot behind the building which houses Pizzeria Uno.

The meeting will start at 7:30PM. A meeting room will be reserved for the MMRA. (Another party may be in the room until 7:15PM.) **Talk-in on 146.82.**

Calendar of Ham Radio Events

Jan 19: MMRA meeting @ Uno's
Jan 22: Antique Radio Flea, Nashua NH
Jan 22-23: ARRL VHF Sweepstakes Contest
Feb 5: "3936 Group" Flea, Tyngsboro MA
Feb 16: MMRA board meeting
Feb 19: AARC Flea, Marlborough MA
Feb 25: MMRA Newsletter Deadline
Mar 16: MMRA meeting @ Hudson L+P
Apr 18: Boston Marathon
Apr 29: MMRA Newsletter Deadline
May 1: Walk For Hunger
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/](http://www.mmra.org/)
