



The Minuteman Repeater Association

# The Minuteman

Volume 32, Number 1

September 2002



## President's Corner by Kevin Paetzold, K1KWP

First I would like to say thank you to all the members who voted to re-elect me as President of the MMRA. I would also like to thank all the other officers and directors, who put in so much time and effort in the past year, for their support.

As I write, it is less than a week since the **Boxborough ARRL New England Division Convention**. I would like to thank all those who stopped by the booth and especially all those who joined the MMRA or renewed their membership. I also want to especially thank all those who helped at the talk-in station, staffed the booth, produced displays, helped during setup, and helped during take down. Our booth seemed to generate a lot of interest and a lot of interesting discussions.

Like last time, the net controls for talk-in were asked to field various questions related to parking. It seems to me that if the MMRA ran the parking operation as well as running the talk-in operation things might work smoother for everyone. This would of course require a much larger commitment from people to work at Boxborough than we have needed before. Perhaps this is something to think about for 2004.



### May 2002 mug shot of the infamous MMRA FoxBox

The MMRA **FoxBox** was hidden at the convention. It was found on Saturday by WZ0C@11:55, W1DYJ@11:55,

KD1LE@12:18, and W1SJ@14:42. It was found on Sunday by: KD1SM@08:38, NF1A@12:00, and W1XP@12:00. Congratulations to those who found it!

In May after the previous newsletter went to press there was a situation where the MMRA FoxBox was investigated by various public safety agencies when it was hidden in Stow, MA. Using the information that is prominently displayed on the FoxBox the appropriate MMRA people were contacted; they responded to the site and after discussion removed the FoxBox. There was a small report of this event in the local newspaper and some Amateur Radio periodicals have also had some small reporting. The FoxBox is usually hidden on what is best described as conservation land (although those hiding it have been known to place it at the end of their driveway in a pile of snow). Indeed, I recall hunting the FoxBox a couple years ago in about the same place that it was hidden this time.

Because there were few active hunters and because of continuing discussion about what the FoxBox policies should be, the FoxBox has been on vacation except for guest appearances at events like Boxborough and the Mobile-a-thon Picnic.

Interestingly there has been some beneficial fallout from this event (for example Stow now has a new RACES radio officer) and hopefully there will be more to come.

**Membership** in the MMRA is slowly decreasing year to year. Last year (2001-2002) the officers made a concerted effort to drive renewals from people who were members in previous years but who had not recently renewed. This effort produced many renewals. However other people who were members in the 2000-2001 year did not renew in 2001-2002. This resulted in a net loss of over 20 members (\$500). Since the MMRA had less than 200 members this is greater than a 10% loss.

(Continued on page 3)

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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](mailto: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 web-site for details.

Email to the club leadership should be sent to [mmra@mmra.org](mailto: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	none	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 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 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)

I would once again like to thank those who renewed or joined recently. Unless you are one of these people or you are one of the few lifetime members, **your membership has almost certainly expired.**

Please continue to support the MMRA and renew your membership! To my knowledge the MMRA has never raised its basic membership dues. We have seen records from >20 years ago which show that memberships were \$25 a year then as they are now. I think there is wide consensus that raising the dues would be counterproductive. Because we do not want to raise dues it puts extra importance on our membership numbers to keep the necessary funds flowing to keep the system maintained and operational. Please use the enclosed application form to renew your membership.

**Donate \$5 to the MMRA at no cost to you:** The MMRA newsletter is available via email as a PDF file. The email version of the newsletter is available earlier and often there is either extra content and/or the photos and graphics are in color. Any member can ask to be put on the email distribution list for the newsletter. Receiving the newsletter via email will save the printing and postage cost for your newsletters. If you have email access please consider electing to receive the newsletter via email. You can make this choice on the membership form or via an email to [mmra@mmra.org](mailto:mmra@mmra.org).

I was very happy to see four **new directors and officers** elected to the board in May. I am sure that W1DYJ, K1IW, KZ1G, and W3EVE are well known to MMRA members due to their previous active involvement in MMRA activities and their involvement in other local amateur radio organizations. Having this amount of new blood and people of this caliber certainly makes me feel a lot better about the long-term future of the MMRA. I hope all members will show their appreciation for the time and effort that all board members, new and old, put into the MMRA.

**How can you become more involved in MMRA planning, decision making, and projects?** It is really very simple. Start attending board meetings. All members are welcome. Board meetings are generally held in Maynard, MA on the 3rd Wednesday of months when there is no general meeting (except in the summertime). Most club decisions (for example, anything involving spending) occur at the board meetings. Sometimes, if there is no agenda item, a board meeting will not occur, but that is rare. Board meetings are announced via email to the [mmra@mmra.org](mailto:mmra@mmra.org) and [mmra@yahoogroups.com](mailto:mmra@yahoogroups.com) mail lists and on the Tuesday night nets.

**The MMRA Operators' Guide** has been updated. This document contains details about the MMRA system and its features including detailed instructions. This document also describes the policies for the MMRA system and its usage. The new operators' guide will be available on both the [www.mmra.org](http://www.mmra.org) web site and the [mmra@mmra.org](mailto:mmra@mmra.org) mail list file area.

**Project Status:** From attending meetings or reading the newsletter closely, you are probably aware of various projects which have taken place in the last year. There are also some long term projects which may seem to be making little visible progress (for example the 53.81/146.610 tower). I can, however, report that behind the scenes there is momentum on many of these projects, and some significant progress was made this year. Hopefully we can bring some of these projects to completion in the 2002-2003 membership year.

At this time which is so close to the one year anniversary of the **9/11 attacks**, I am sure I do not need to remind anyone that there is still a significant terrorist threat imposed upon the United States. It is clearly prudent for people to be prepared, and I hope that everyone is continuing to do so. The web pages for Eastern Massachusetts ARRL ([ema.arrl.org](http://ema.arrl.org)) and ARES ([www.emaares.com](http://www.emaares.com)) have information about upcoming activities like training and drills. There is also information on how to be more prepared. Please take the time to check them out.

## Election Results by Clark Conti, N1NVK

On Wednesday, May 15, 2002, at the regular membership meeting, the Minuteman Repeater Association held its annual election of officers and board members. The results are as follows.

### Officers (1-year term):

President:.....Kevin Paetzold ...K1KWP  
 Vice President:.....Bob Evans.....N1BE  
 Treasurer: .....Bill Northup .....N1QPR  
 Secretary: .....Bob DeMattia .....K1IW  
 Clerk: .....Jon Titus.....KZ1G

### Directors (2-year term):

Shelley Northup.....N1VJE  
 Steve Schwarm.....W3EVE  
 Larry Banks .....W1DYJ \*  
 Bill Thorpe .....WA1NLR \*\*

\* 1 year replacement term.

\*\* Existing term, up for election next year.



## Repeater Report by Bryan Cerqua, W1BRI

It's been a fairly quiet summer as far as repeaters go, which is fine by me. Yet there have been numerous changes to the system since the last newsletter.

I'll start with a big thanks to Kevin, K1KWP, and Bill, WA1NLR, for repainting the shelter at the Marlboro Country Club. This site houses the 146.61 repeater and the 53.81 transmitter.

I placed an extra fan in the 53.81 MHz transmitter. The fan is supposed to run when it's hotter than 90° F in the rack. I don't know if it really is being used. I need to get up there with my hair dryer and infrared thermometer to check it out.

The new MMRA Secretary, Bob, K1IW, has arranged for the 447.875 repeater in Brookline to be linked to the MMRA system. This will give us much better coverage in Boston and improve our ability to support public service events. Thanks Bob!

I have plans, when it cools off some, to improve the Shrewsbury 449.575 repeater with better shielding and to remove the 900 MHz notch filter on the link radio since the 900 MHz paging transmitter was removed from the building. Also I want to improve the link to the Milford repeater.

We are considering increasing the Quincy 224.400 repeater TX power in the event we put something up on the Cape to tie into the MMRA. I'm hoping to find some kind of 220 MHz power amp to boost the 10W to say 50W or higher. This is just a long-range plan at this time.

At the hub site, I re-aligned the Quintron transmitter VHF

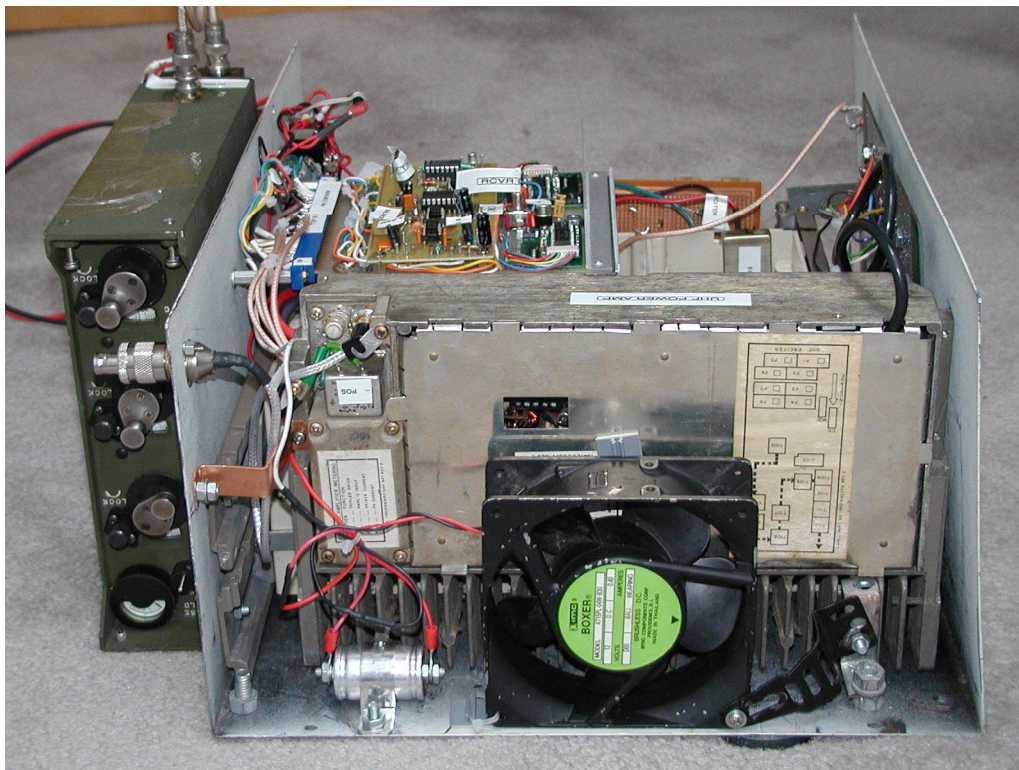
multiplier board, and it seems to have cured the problem with 449.925 output power drifting down on hot days.

A major change to the system was to add a **voter circuit for 6-meter reception** at the hub site. This allows us to use a 71.9 PL on both 6-meter receivers. The 173.8 PL radio is waiting for a new home where we might set up another 6-meter receiver. I don't have much to say about the voter except that I placed it in service some months ago, and it seems to be working great. I have not touched this thing since dropping on the bench up at Slygo; knock on wood.

The voter control board is basically the same as the original WB2WHC design, as shown in the October 1992 QST, with a few exceptions. The voter board runs on a regulated 10V supply instead of 12 volts. The 10V supply is also used to power the MASTR II receivers and exciter.

The system uses two Communications Specialists TS-64 encode/decode CTCSS boards. The one labeled CTCSSA, in addition to providing PL tone decode for receiver A, is also used to encode the PL for the UHF link TX via the CG HI input on the MASTR II exciter. The voter PTT is an active low open collector output that connects to the TX Input PTT on CTCSSA. The TX output on CTCSSA is used to turn on a PNP transistor that pulls the MASTR II TXOSC exciter pin to 10 volts causing the exciter to transmit. CTCSSB is used only to decode the PL for receiver B.

The COR A & B inputs are active low and are taken from the TS64 RX Audio Mute outputs. RX Audio Mute is an open collector pulldown. On the voter board there are 10KΩ pulldown resistors that set the de-asserted state to logic high or ~10V. Originally the raw VOL-SQHI discriminator audio was used to feed the audio A and B inputs. The TS64 has a 350 mS hang time after carrier drop that causes an annoying squelch tail to be heard on the link transmit output. The TS64 has a reverse



Electronics package for the 6-Meter RX: two receivers with tone squelch cards, voter, pre-selector, preamp, UHF link exciter and UHF PA.

## Repeater Report (cont.)

PL burst, but that happens after the hang. I called up Comm Spec and asked if this hang time could be shortened or eliminated. They said it was fixed in the microprocessor firmware and couldn't be changed.

This was unacceptable so a change was made to the voter gain stage input opamps to gate the audio using the CAS output from the MASTR IIs. To have CAS active you need to add the squelch pot to feed some of the raw audio into the MASTR II squelch circuit via SQARM. This was done using a small plug in board with a variable resistor on it to set the squelch threshold. CAS is about 9V with signal present and about zero V with no signal. Using a diode with the anode connected to the CAS output and the cathode connected to the inverting input (U1A pin2, U1A pin 6) of the audio input gain amp creates a muting function that prevents the squelch burst from being heard. When no signal is being received the diode pulls the inverting input to ground causing the opamp to de-bias itself which in turn causes the opamp output to slam positive, providing muted audio. With signal present the diode is reversed biased and the opamp works normally. (The audio input gain stages are biased to half the 10V supply voltage.) During the 350ms hang time the UHF transmitter is on with PL and muted audio, about 160ms after the hang comes the reverse PL burst. This eliminates any squelch tails on the users as well as when the UHF link transmitter drops.

The audio level fed into the voter inputs is quite large so a 200Ω resistor to ground was added to the other side of each 1KΩ input resistor. This was necessary because the MASTR II need to have enough audio amplitude on the VOLSQHI outputs so that the squelch circuit has adequate noise amplitude on the SQARM inputs. At the same time, you don't want to over drive the inputs stages on the voter board since the lowest adjustable gain for the input stages is unity with the R1 and R2 at the minimum resistance setting. With the proper amount of signal on TP1 and TP2, which are the outputs of the A and B gain stages, there is enough audio at J3 via R3 to drive the MIC HI input on the MASTR II exciter. There are two adjustment pots on the MASTR II exciter: one for setting the PL TX level and the other one for setting the maximum amount of deviation at 5KHz. One should not use the deviation limit pot on the exciter for setting the deviation, only the maximum deviation when driving it with full audio. R3 on the voter board is used to set the deviation.

Another change was to increase the no signal mux input for U4B pin 2 and U4C pin 5. Originally this voltage was  $10V/2 = 5V$ , but this was not high enough since the output of the noise rectifiers U2A and U2B could go higher than 5V with the gain setting of R1 and R2. This is because the amount of high frequency audio content that gets through the high pass filter capacitors C8 and C9 depends on receiver design. To fix this problem the voltage was increased to 6.3V by adding a 1.2KΩ resistor in parallel with the topside 1KΩ.

Since this is more of a diversity reception system instead of a voter system, the time constants set by C10 and C11 were shortened to about 0.5 seconds. C10 and C11 were reduced from 47μF to 10μF. The faster time constant allows the system to better follow mobile fading.

Receiver A is connected to the PD83 antenna on the south side of the water tower. A 3-stage adjustable helical pre-selector and 10dB preamp are used at the receiver input. The preamp provides about 10dB gain. The pre-selector is used for two reasons, to prevent out of band overload to the preamp and to prevent the mix between the 147.27 co-located repeater and the 94.5 MHz FM broadcast station. The mix of 147.27 - 94.5(+/- 75 KHz deviation) is 52.695 to 52.845 MHz; this mix splatters across our 52.81 receiver input frequency.

Receiver B is connected to the Diamond DP-GH62 ground plane that used to be the 173.8 PL receiver antenna.

The UHF link TX power is set to 15W and fed to a horizontally polarized UHF TV corner reflector. Slight adjustment of the MASTR II exciter last stage transformer was required since a longer jumper was added between the exciter output and the UHF PA input.

Since the receivers share the cabinet with the UHF power amplifier, I thought it might be a good idea to have a fan to keep the PA cool. The fan is controlled by a power MOSFET transistor in the negative supply line. TXOSC is fed through a diode to pull the gate of the MOSFET high. A 100μF cap in parallel with a 1MΩ resistor to ground holds the gate voltage high a few minutes to keep the fan from turning on and off during repeater usage. The fan slows down gradually after use since the gate drive is decreasing. Whenever the UHF link TX is on, the time constant is reset, putting the fan on at full speed.

The MOSFET source pin was connected to the same ground as the control card. This caused a fan whine in the UHF TX signal. The ground for this pin was directly routed to the negative supply banana jack which took out most of the fan whine. An automotive alternator feed-through capacitor in the +12V line to the fan cleaned up the rest of the noise.

**Voter Adjustment:** Voter audio levels were set with strong RF fed into each receiver modulated with a 1 KHz tone at 3 KHz deviation. Manually ground each CORA, B input while setting levels so the input opamps are not muted. The Mux gates U4B and U4C select the noise rectifier outputs instead of the 6.3V voltage divider input. I measured the audio levels with a Keithley model 179 true RMS AC voltmeter. A DMM was used to measure the DC voltages. A Motorola R2001A was used to feed the RF input to each radio via a splitter with ~3db insertion loss. TX PL level was set to 500 Hz deviation with no other audio present.

*[Unfortunately, Bryan overflowed beyond the available space in the printed newsletter. The email newsletter has more pictures, the schematic, and a table of adjustments — Ed.]*

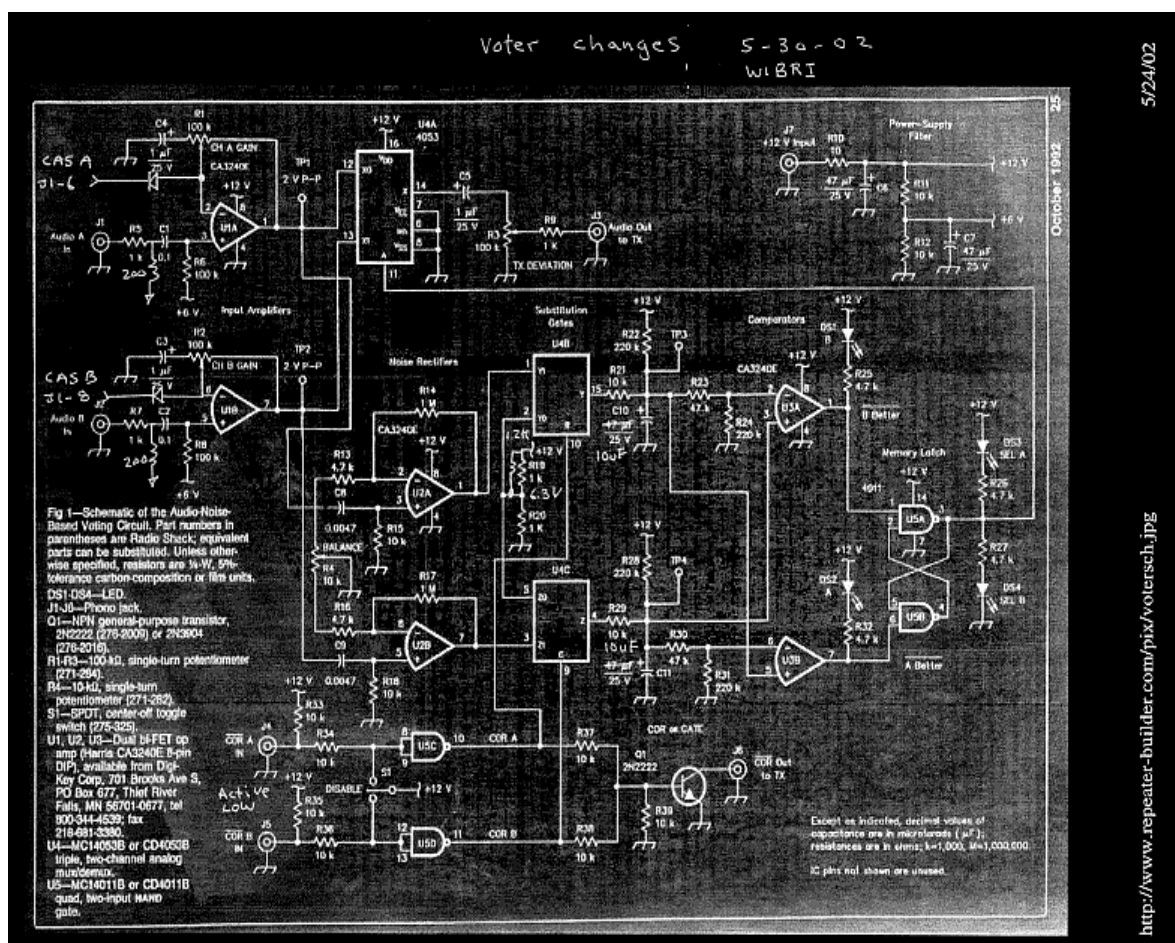


## Repeater Report (cont.)

Measured values during voter adjustment:

Measurement Location	Measured Value	Condition
IF AMP Receiver A	100 mVDC	RF input ~ 0.8 $\mu$ V
IF AMP Receiver B	103 mVDC	RF input ~ 0.8 $\mu$ V
Audio Input A	0.911 VRMS	1 KHz Tone @ 3 KHz Dev.
Audio Input B	0.895 VRMS	1 KHz Tone @ 3 KHz Dev.
TP1 (A)	0.294 VRMS	1 KHz Tone @ 3 KHz Dev.
TP2 (B)	0.287 VRMS	1 KHz Tone @ 3 KHz Dev.
TP3 (A)	3.54 VDC	1 KHz Tone @ 3 KHz Dev.
TP4 (B)	3.58 VDC	1 KHz Tone @ 3 KHz Dev.
J3 Output	0.075 VRMS	1 KHz Tone @ 3 KHz Dev.
UHF TX RF Output	15 W	Yaesu YS 500 Power Meter.
Regulated 10V	9.96 VDC	No Exciter Active

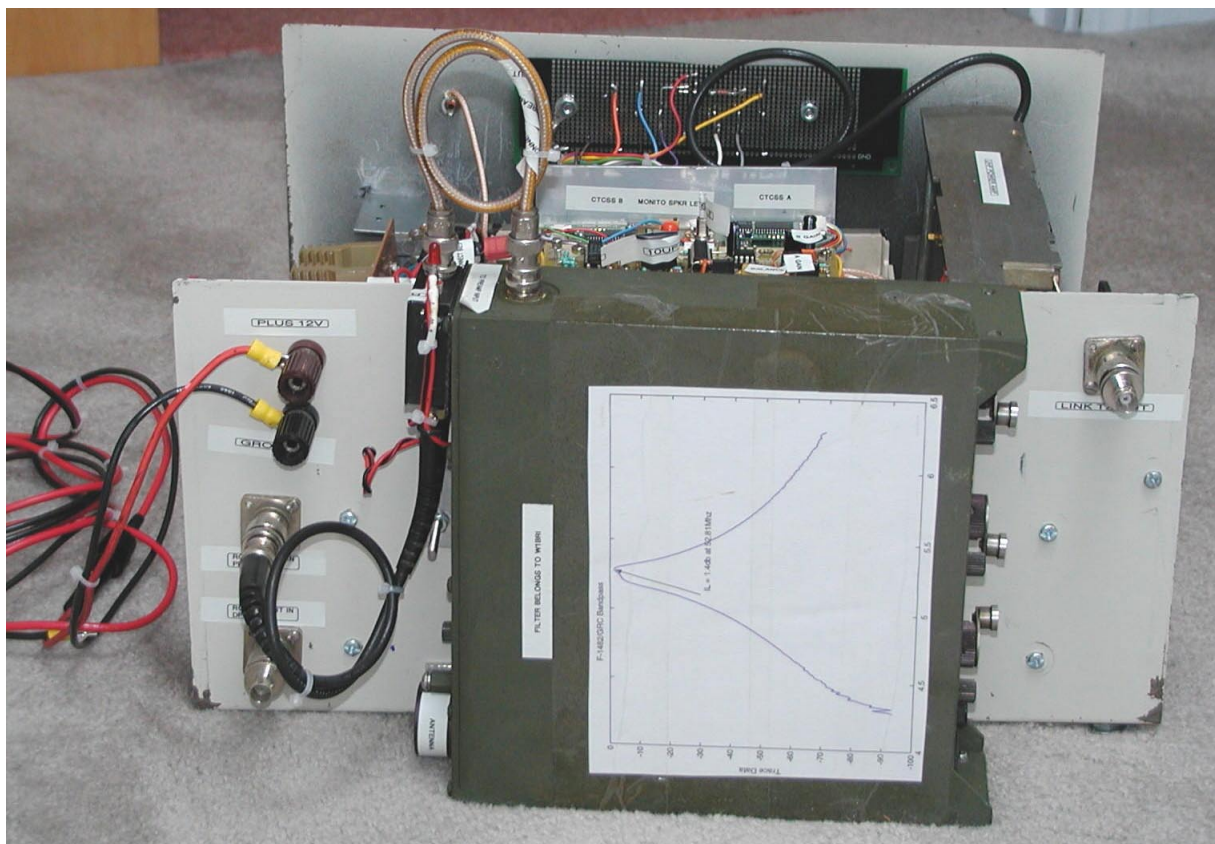
Voter  
schematic  
with  
changes  
by W1BRI:



## Repeater Report (cont.)

To the right is the complete 6-Meter RX site electronics package.

Below is a view of the package from the rear.





## 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. **Every event listed is looking for communications volunteers.**

<u>Date</u>	<u>Location</u>	<u>Event</u>	<u>Contact</u>	<u>Tel/Email</u>
Sep 13	Provincetown MA	MS Challenge walk	John N1PYN	508-588-3250 n1pyn@arrl.net
Sep 14	Boston	MA WGBH FunFest	Bob, WA1IDA	508-650-9440 walida@arrl.net
Sep 14	Truro	MA MS Challenge walk	John N1PYN	508-588-3250 n1pyn@arrl.net
Sep 15	Boston	MA WGBH FunFest	Bob, WA1IDA	508-650-9440 walida@arrl.net
Sep 15	Brewster&Dennis MA	MS Challenge walk	John N1PYN	508-588-3250 n1pyn@arrl.net
Sep 22	Natick to Grafton to Stow MA	MA Ride for Hunger	Bob K1IW	413-647-3060 cpsg@amateur-radio.net
Sep 29	Boston	MA Jimmy Fund walkathon (Marathon route)	Steve W3EVE	508-305-8919 w3eve@arrl.net
Oct 5	Boston	MA ADA walk for Diabetes	Bruce KC1US	781-275-3740 kc1us@net1plus.com
Oct 13	Boston	MA BAA Half Marathon	Bob, WA1IDA	508-650-9440 walida@arrl.net

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(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.

World Wide Web users: the most recent copy of this list is maintained as <http://purl.org/hamradio/publicservice/nediv>.

## Fox Hunting

Fox hunts, or hidden transmitter hunts, have long been a staple of MMRA activities. The 10 AM Saturday hunts happen almost every week on 146.01.

### Fox-a-thon:

Once again the MMRA will hold a Fox-a-thon on Saturday, October 19th. In this popular event, anyone who is interested is invited to ride along with experienced MMRA fox hunters during one of the weekly fox hunts. To provide a dif-

ferent coverage area, the Fox-a-thon will use the Stoneham 146.715 repeater. Although all details are not set, we expect to assemble at 9AM somewhere near that repeater. Further information will be announced on the Tuesday net or via yahoo groups e-mail (see pg. 2).

If you are interested in participating, please reserve your self a seat by email to [mmra@mmra.org](mailto:mmra@mmra.org) or by voice on a Tuesday net.

## My Day with the MMRA FoxBox by Eddie Mulhern, N1NOM

I hid the FoxBox after the Saturday fox hunt behind the Stow shopping center. I waited for it to transmit and when it did I left and went for my walk.

I heard Berlin Bill, WA1NLR, on the radio and said hello, and he said that he got a call about the box and was told that if it was not moved the state police were going to blow it up. I said I would go back and pick it up. Bill said he was on the

way there but he did not have a key.

When I got there the Stow police had the back of the shopping center blocked off with at least two police officers and there was an environmental police officer there. I talked to a Stow police sergeant who was just fine with the box but said we had to wait because the State Police Bomb Squad was on

*(Continued on page 9)*



## Fox Hunting Really Is More Than Just Fun by Andy Morrison, N1BHI

Here's a little anecdote about how Foxhunting techniques got a local electric utility out of some serious trouble. I've been consulting for the company, helping them with planning an upgrade of their voice radio systems. On July 4th at about 0630 I got a call from the VP I have been dealing with. He was looking for help. Their "RadSec" system was down.

To understand why that warranted a panicky call early on the morning of a major holiday, RadSec stands for Radio Sectionalization. When running an electric utility, with wires hanging on poles that various forms of lousy weather could take down, they need a way to turn off sections of the distribution circuits to isolate them while fixing them. They also need information about the voltages and currents from key places.

That's what RadSec does - it allows someone sitting in the control center to tell a computer to isolate a section of the circuit. The computer sends commands via radio. Two way radios on poles are connected to small computers that are listen for those commands. Without having someone climb a pole and flip a switch, the control center can turn the juice off. The crew can go directly to the problem area without having to worry about going to unplug things first.

When this system is not working, and we have impending bad weather, they still are responsible for managing outage restoration and might even be downright worried. That was the situation when I got that call the morning of July 4th. There was a possibility of significant thunderstorm activity that afternoon, and the RadSec system had been off the air for about 36 hours. The utility people were pulling their hair out by the roots.

The guy directly responsible for the system told me that his radio people had determined that there was some kind of interference that was blocking the input frequency of the RadSec repeaters; they transmit commands on one frequency and receive data on another in full duplex, just like our repeaters. They had no idea what the source of the interference was; after conferring for a while we agreed that it was either a pole radio stuck in transmit, or some external interference. I asked them to look at it with one of their IFR 1500's connected to a good antenna. In minutes they were able to tell me they saw a clean

spike sitting right on their input frequency. That made me pretty sure it was one of their transmitters stuck on.

They started to talk about equipping 20 or 30 people with handheld radios and sending them out to listen for the signal - I asked how long they figured that would take. When they realized that the total time to round up the radios, program them, get the people together, instruct them and get them into the field would be 10 or 12 hours, I suggested that there was a much quicker way.

After all, how hard is it to find a fox who transmits constantly? It's like shooting fish in a barrel.

I had them start rounding up some materials to make a couple of two element quad antennas which can be put together very quickly. They won't be pretty, but they will work. And I started the drive into Boston.

I tuned my ICOM 706 to the RadSec input frequency, figuring that I might be able to hear it, and there it was! On VHF the 706 is a fairly deaf rig, so to hear the signal with good quieting meant it was strong. As I went east on route 20, I noted that the signal dropped off significantly when I had Nobscott Hill to my right. Hmmm...it must be to the south.

I turned down Edgell Road towards Framingham center and the signal started getting stronger. By the time I reached Framingham center, I had measurable signal strength with the attenuator on; that's 40 db down from the level with the pre-amp on. I called the guy who was waiting for me in Boston. "We won't need the Quads. I hear it strong in Framingham."

I won't go into the details of the hunt but suffice it to say that using "manly foxhunting technique," we found the offending pole transmitter less than an hour after we started. When we got close enough for body fades to work, I stood in a parking lot, made three rotations and pointed.

When we got to the offending pole, a guy went up in a bucket and unplugged the radio — the interference disappeared. One of the guys who had been in the parking lot when I was rotating like some kind of fool looked over at me. "I gotta tell you, I thought you were crazy twirling around in that lot, but this is right where you pointed!"

*(FoxBox...Continued from page 8)*  
the way.

I found out later that the environmental cop was there because someone called them about a problem hawk that was flying around the area. Nonetheless he was giving me a bunch of crap even though he had nothing to do with it. I asked him if he could read (the label on the box) and he kind of shut up.

Next came the Stow police chief and he turned out to be OK after a minute. I think they were impressed that we showed up so quickly, had a good cause and a good label on the fox box.

Next came the Fire Chief and then after a few phone calls and elapsed time the State police bomb person and then the State police K-9 person and another call to the Fire academy in Stow for something.

That's when the bomb person took charge; he was a nice guy. We went to where the box was tied around the tree. He scoped it out, read the label, took some pictures and had us take it out and open it. At this point it seems they were using this as a practice session for their procedures. I think they all enjoyed it at this point.

The state police bomb guy said we should put a label on all four sides of the box and notify the police in the area of the hide but he in no way wanted us to stop our activities with the box. He thought it was a good practice and after the K-9 went pee we all shook hands and said goodbye.

Of note, the bomb guy said that since 9/11 they just blow things up using a high pressure water slug of some type that goes thru the bomb and explodes to open it up. Of course it ruins anything inside.

# Next Meeting — Wednesday September 18, 2002

## N1VUX: Atmospheric Modeling of VHF/UHF Tropo and Ducting

Bill Ricker, N1VUX, will speak about an interesting project he is working on. The goal of this project is to develop and validate a computer model for diagnosis, forecast, and retro-cast of the VHF/UHF/Microwave phenomenon known variously as "anomalous

propagation", "tropospheric ducting", "superrefraction", "lift" and "tropo". This includes both tropo-enhancement, nocturnal inversion superrefraction and true ducting, but not tropospheric scatter and back-scatter.

Bill Ricker is a mathematician working in software. Bill also holds an appointment as ARES District Emergency Coordinator (DEC) for Metro/Boston & Skywarn net control and backup-coordinator. This project connects his radio, math, weather, and programming interests.

## Calendar of Ham Radio Events

- Sep 18:** MMRA meeting  
**Sep 21:** FARA Extra "crash" Course  
**Oct 4-5:** Hopkinton NH Hosstraders Flea  
**Oct 19:** MMRA Fox-a-thon!  
**Oct 19:** FARA Extra "crash" Course  
**Oct 20:** Cambridge Flea at MIT  
**Oct 25:** MMRA Newsletter Deadline  
**Oct 24-27:** Enfield CT Microwave Update  
[www.microwaveupdate.org](http://www.microwaveupdate.org)  
**Nov 2:** MA Simulated Emergency Test  
**Nov 3:** Framingham FARA Flea  
**Nov 20:** MMRA meeting

(Flea market info from W1GSL list. <http://mit.edu/w1gsl/Public/ne-fleas>)



### MMRA VE Sessions

3rd Saturday of each Month

9 AM at the Marlboro Public Library

**Contact: Bill Wade, K1IJ**

781-891-9079 Evenings 6 to 10 PM,

Weekends 8 AM to 10 PM.

**Accredited by the ARRL VEC**

### THE MINUTEMAN REPEATER ASSOCIATION

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

Email: [mmra@mmra.org](mailto:mmra@mmra.org)



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

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# **Minuteman Repeater Association**

## **Quick Membership Renewal**

(Please use reverse side for new memberships)

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 Boxboro suite or mail to:

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

**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:

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Antennas                 | <input type="checkbox"/> Meeting Setup                | <input type="checkbox"/> Speaking at a meeting |
| <input type="checkbox"/> Association Officer      | <input type="checkbox"/> Net Control                  | <input type="checkbox"/> Special Projects      |
| <input type="checkbox"/> Board of Directors       | <input type="checkbox"/> Newsletter                   | <input type="checkbox"/> Technical Library     |
| <input type="checkbox"/> Education                | <input type="checkbox"/> Public Service               | <input type="checkbox"/> Web Site              |
| <input type="checkbox"/> Emergency Communications | <input type="checkbox"/> Publicity                    | Other—Please specify:                          |
| <input type="checkbox"/> Equipment Construction   | <input type="checkbox"/> Radio Shelters               | _____  |
| <input type="checkbox"/> Equipment Transportation | <input type="checkbox"/> Refreshments                 | _____  |
| <input type="checkbox"/> Grant Writing            | <input type="checkbox"/> Repeater Control Operator    | _____  |
| <input type="checkbox"/> Legal Aid                | <input type="checkbox"/> Repeater Technical Committee | _____  |
| <input type="checkbox"/> Medical Aid              | <input type="checkbox"/> Social Events                | _____  |

Other family members:

Name: \_\_\_\_\_ Callsign: \_\_\_\_\_ Class of License: \_\_\_\_\_

Name: \_\_\_\_\_ Callsign: \_\_\_\_\_ Class of License: \_\_\_\_\_

Name: \_\_\_\_\_ Callsign: \_\_\_\_\_ Class of License: \_\_\_\_\_

Name: \_\_\_\_\_ Callsign: \_\_\_\_\_ Class of License: \_\_\_\_\_