



♦ The Minuteman ♦

Volume 25 Issue 3

January 1998



A LITTLE BIT OF HISTORY

By Steve Rudin, W1WSN

Once upon a time there was a group of radio amateurs who were busily trying a new communications technology... FM communications using repeaters. The year was 1965, and while in graduate school in Illinois (using the additional station call sign of W9IZF), I learned quite a bit about the new rage which was then sweeping the country from West to East.

There were no amateur radios manufactured for two meter FM communications, and so we used commercial radios taken out of police, fire, or taxi service. They were usually one-channel jobs, with at least 17 tubes, dynamotor and vibrator power supplies, and required precision crystals operating in thermally stable ovens. You really had to be a service tech to get them operating well and on frequency! There was one lonesome repeater operating downstate, while there were THREE (yep, three) operational in Chicago!

When I got back to Massachusetts, I crystallized up on the one machine in our area, which was on 22 - 94. This was done so that hams with two-frequency radios would only need to buy a .34 transmit crystal and switch to WIALE repeater in Concord NH on 34 - 94 (Ted's machine is still on the air). Our local repeater was a technical marvel of its time, the brainchild of Paul, W1ELU, and was located in Marlboro.

As the number of hams using the repeater grew, and as summer ducting created havoc with QRM from WIALE, the repeater switched to the present frequency pair of 22 - 82, and the Marlboro FM Association was born. Now in those days, the FCC tried to deal with the increasing number of repeaters with both frequency coordination (still used today), and a complex licensing procedure and rules package which are no doubt suited for WBZ-TV, but were not to be believed for ham radio! Remote control points were needed, as was

logging of all transmissions!! Autopatch operation had to be justified, and public service was the reason for our first autopatch (though we have some wild stories to tell you some other time!!). Repeater operation was becoming much more complicated.

With all this and more going on, Paul, W1ELU, became disenchanted when he realized that serving the technical needs of a large (150) group of hams was taking more and more of his time and energy. What had started as a personal exercise in technology was now becoming more of a political operation, and so one fateful day early in 1971, he announced that on a day soon to be publicized, W1ELU would cease operation as a repeater station.

We were aghast! What could we do to keep 22 - 82 alive and well after the plug was pulled at W1ELU? An organizational meeting was held by the membership at that time, and the group concluded that if we could get a location, equipment, and manpower, we could at least get a no-frills machine on the air. The call for help went out, and was immediately answered by Bob Waters, W1PRI, and the late Father Dan Linehan, W1HWK. Bob announced that he and Jeanie were going to Europe, but we could use their home, tower, electricity, kitchen, and, of course, the bathroom as well!! With that statement, he gave me the key to their home, and informed the police that we would be using his property. Father Dan talked to the powers-that-be at Campion Center (Weston College in those days), and we got permission to use a room on the top floor as well as to erect an antenna on the roof. We were first told that only priests could have keys, and Father Dan asked me if I had children, to which I responded in the affirmative. "Then that makes you a father", he told me, after which I was promptly issued a key!

(Continued on page 2)

The President's Corner

A few things have been happening this winter....first, our plans for a flea market are taking shape. Walter Ching, N1HBR, kicked it all off by arranging for the Westborough High School, getting Lentini Communications to agree to come up from Connecticut again and getting all the magazine notices placed. We should have final confirmation before the meeting Wednesday. This issue includes a flea market flyer, even though we do not have final paperwork from Westborough in hand. This is so that members can make copies and give them to friends or leave them where they may do some good.

We will need people at the flea market to help — remember that if you show up to work the event, you get free eats and drinks, get to hang out with a great bunch of guys and get the first shot at the good deals as the vendors unload!

(Continued on page 2)

JANUARY MEMBERSHIP MEETING

WEDNESDAY, JAN 17, 1998 - 1950 HRS
CAMPION CENTER, WESTON MA
PROGRAM:

Easter Island DX-pedition
Joe Rich, N10CS

Raffle

A Little Bit of History....

The President's Corner

(Continued from page 1)

We could not get a duplexer on short order and with short money, so it was decided to put a split-site repeater on the air. A Motorola surplus station was quickly assembled, and a .22 receiver on top of the Campion Center transmitted the signal on 448 MHz to a UHF receiver at WIPRI's home (a couple of miles away), which was then rebroadcast on 146.82! With a bunch of dedicated hams, lots of burned fingers, censored vocabulary, and a ton of luck, 146.22 - .82 was on the air as WIPRI repeat. A good thing, too, as we narrowly averted a "repeater war" with another group who wanted the frequency pair.

In the summer of 1971 we not only had a repeater on the air, but a new organization as well. With Attorney Paul Zonderman, K1JDF (still a member as W2ILM), drafting the constitution and by-laws, the MMRA was duly incorporated. A good thing, too, because many decisions, both electronic and legal, had to be made and acted upon. Crystal controlled ham receivers had made their appearance on the market, such as Regency HR2As and ICOM IC2Fs. Our numbers continued to grow. Our technology grew as well, moving from relays to solid state and computerized repeater functions. If you look on page 5 of the Minuteman for November 1995, you will see the newsletter which lists the nucleus group of amateurs that guided the MMRA in its early stages.

What you WONT see is a list of the many hams who brought food, cold drinks (all soda, of course), needed parts, muscle, good cheer, and encouragement. Many, like Larry MacDonald and Bud Miller, are now silent keys. Many, like yours truly and Bob Waters, are often "in the weeds", listening and keeping an eye on the ol' machine.

Yes, we grew, expanded operations, and eventually had four 2 meter repeaters on the air. This involved many mergers, arguments, hassles, frustrations, and more cut and solder-burned fingers. But then, those stories are for a later installment!

Editor's Note: We do hope that Steve will have the time to give us more installments....if you hear him on the air, exhort him for more! Look elsewhere in this issue for more memorabilia from early Minuteman issues.....and if there are any other MMRA plank holders who would like to contribute-get in touch!



MMRA VE Sessions

2nd Saturday of Each Month
Marlboro Public Library, 9AM
Contact: Bill Wade, K1IJZ
617-891-9079 Evenings 6 to 10 PM,
Weekends 8 AM to 10 PM.
Accredited - ARRL VE Program

(Continued from page 1)

meter band. Bryan, KA1YQB, is working on the details of putting a repeater on the air. There's a lot to be done — coordination, site planning, equipment preparation — and I'll bet he would love to have some more guys get involved to help. If you are a 6 meter enthusiast, or would like to become one, get in touch with Bryan and offer him some assistance. One of the key things in this project is hardware — we have come into possession of a GE Master II low band base station that can be moved onto 6 meters... So we'll have commercial grade equipment on that band.

Along with the low-band base we acquired two GE Master II high band stations. As hams, you will know what I mean when I say that the "price was right..." All the stations were working when pulled out, in daily use. we will use them to upgrade and/or improve operations....Chris will write more about that in upcoming repeater reports.

Our compliments and thanks go to the crew that got 449.575 back on the air in Taunton. Only a bunch of hams would go out and climb or stand under a tower in the middle of winter...and only a group of dedicated (read crazy, obsessed) guys at that. Bob, WA1ZJE, Armando, N1TYG, Ed, N1NOM, and..... all went down on a Friday morning to do the job. The repeater plays a lot better at its home site now....since the cavity repairs, Bob tells us that before it took 20 watts from his mobile to get into the machine. Now he can do it with an HT from inside the house.

The meeting program this month should be pretty interesting. Have you ever dreamed of going off to some exotic place, setting up a station and working pileups? Well for those of you who have, the presentation about the Easter Island DXpedition should whet your appetite. If you haven't yet delved into the world of HF operating and DXing, you may all of a sudden find new incentives to give it a try.

One of our members, Ken, WB1APS, had a close call recently. He had an accident in his company car — someone slid into him because of slippery conditions....we're glad he wasn't hurt. He's a regular user of all the repeaters; he gets around a lot while on the job.

While it may seem premature to mention Field Day while there is 20 to 30 inches of snow on the ground, I just want to remind everyone that we are going to do it again this June. We have a small but enthusiastic Field Day group—the emphasis is on fun, and we have a lot of it. It would be nice to see a few more people come out and join in. It's a valuable experience; if you have any interest in emergency communications, Field Day provides an opportunity to see how amateur radio could support public officials in an emergency. I know there are a few of you who are fairly new to the hobby, and if you haven't seen or participated in a Field Day yet, come to Slygo Hill and see how it works. You might find it as much fun as we do....

Hope to see you at the meeting Wednesday!

H-2782 Becomes Law!**PRB-1 clone in MA (ARRL Bulletin 106 ARLB106)**

A new law in Massachusetts will put the language of the FCC's federal preemption of state and local laws affecting amateurs (PRB-1) on the books in that state when it takes effect next year.

H-2782, a bill in the Massachusetts legislature, was written by ARRL Volunteer Counsel Thomas Carrigan, WA1NVS, in 1992. The bill was passed by both chambers of the legislature earlier this year, then sent back to the legislature by Governor William Weld, for modification. Both chambers of the legislature then enacted the bill in the last week of this year's legislative session and sent it to the governor, who signed the bill into law on November 21.

The bill becomes law 90 days after signing, and is assigned to Chapter 225 of the Massachusetts General Laws.

Eastern Massachusetts ARRL Section Manager Phil Temples, K9HI, said "Like PRB-1, the new Chapter 225 does not give amateurs a green light to do anything they want to do with their antennas. You are still bound by the zoning laws of your city or town, and you will still have to go through the same process for approval that you have to go through now.

"So what's the difference? Now, when you go to your town hall, you can point to Chapter 225 as requiring that local regulations be reasonable. If you should find it necessary to go to court for satisfaction, you can choose state court or federal court. State court trials would be less expensive, but the precedents set in PRB-1 cases do not transfer to Massachusetts courts," Temples said.

Carrigan has written a primer for Massachusetts hams on what the new law means. It is available on the World Wide Web at:

<http://www.ultranet.com/~shawn/wa1nvs.html>

Temples also suggested that Massachusetts amateurs who contacted their representatives and senators in support of H-2782 now send a note thanking them for their support.

(Editor's Note: For those of you who have not yet traveled the on-ramp to the information super-highway, we include the above referenced Web document.)

Summary of H-2782 Effects

by Thomas C. Carrigan, Attorney at Law
WA1NVS

The following is a summary of the anticipated effect of Chapter 225 of the Acts of 1995 [of the Massachusetts Legislature], formerly known as House Bill 2782 (H-2782) entitled "An Act Relative to Local By-laws and Ordinances Regulating Antenna Structures used by Federally Licensed Amateur Radio Operators," and commonly called the Ham Radio Tower Bill.

WARNING: THIS SUMMARY IS NOT LEGAL ADVICE AND IS NOT A SUBSTITUTE FOR COMPETENT LEGAL COUNSEL AS TO ANY PARTICULAR SITUATION. NOR IS THIS SUMMARY OF THIS ONE ACT A COMPREHENSIVE

ANALYSIS OF THE LAW. THERE MAY BE LEGAL RESTRICTIONS OTHER THAN THOSE DEALT WITH BY THIS ACT WHICH SIGNIFICANTLY AFFECT A PERSON'S RIGHTS AND OBLIGATIONS WITH RESPECT TO TOWER CONSTRUCTION AND LOCATION. ADDITIONALLY, THIS ACT HAS NOT BEEN REVIEWED BY ANY COURT AS TO ITS VALIDITY, INTERPRETATION, OR APPLICATION TO SPECIFIC CIRCUMSTANCES. THEREFORE, THIS SUMMARY SHOULD BE READ AS ONE LAWYER'S OPINION ABOUT WHAT THE ACT MEANS.

The Act, now a state law, which becomes effective 90 days after it was signed (i.e. 90 days after November 23, 1995), provides the following:

"No zoning ordinances or by-law shall prohibit the construction or use of an antenna structure by a federally licensed amateur radio operator. Zoning ordinances and by-laws may reasonably regulate the location and height of such antenna structures for the purposes of health, safety, or aesthetics; provided, however, that such ordinances and by-laws, reasonably allow for sufficient height of such antenna structures so as to effectively accommodate amateur radio communications by federally licensed amateur radio operators and constitute the minimum practicable regulation necessary to accomplish the legitimate purposes of the city or town enacting such ordinance or by-law.

"Nothing in this act shall be construed as limiting the authority of any architectural or historic district commission established pursuant to any general or special law."

The Act was intended to resolve confusion which exists between amateur radio operators and code enforcement officers by establishing a single standard for the regulation of Amateur Radio antenna structures. By incorporating the substance of the federal law, which does not come readily to the attention of the local code enforcement officers, into the state Zoning Law (General Laws chapter 40A), it is hoped that Amateur Radio operators and code enforcement officials can begin "reading off the same page" with respect to the application of zoning

by-laws and ordinances to Amateur Radio antenna structures

The Act mirrors provisions already in the federal law (at 47 CFR 97.15(e)). See PRB-1. It does not create any new rights for amateurs, nor any new (substantial) restrictions on local officials, since, in my opinion, they were already subject to the federal law. The problem was that the federal law did not come to the attention of local officials. Frequently, when the federal law was pointed out to them, the local officials still were unsure of its relevance to them. Local officials should have no question about the

(Continued on page 5)

Items of Interest.....**ARLB111 New 2300 MHz uses**

An October report by the National Telecommunications and Information Administration (NTIA), entitled Land Mobile Spectrum Planning Options, suggests a new use for the band 2300-2310 MHz, now allocated to the Amateur Service on a secondary basis. The report states that the band has potential for new, non-Federal radiolocation, fixed and mobile communication technologies. The report also notes that constraints are necessary for the protection of NASA's Deep Space Network and Planetary Radar operations in an adjacent band. A table in the report describes a possible future use of the band as Wide Area Land Mobile.

The 2300-2310 MHz band is expected to be the subject of an FCC allocation proceeding as a follow-on to ET Docket No. 94-32, which dealt with 2390-2400 and 2402-2417 MHz.

ARLB112 Spread spectrum changes

The ARRL has asked the Federal Communications Commission to relax its spread-spectrum regulations to give Amateur Radio more opportunity to contribute to spread-spectrum development. The League's petition for rulemaking, filed in December, seeks relaxed restrictions on spreading sequences and greater flexibility in spreading modulation. The spread-spectrum technique, which distributes information among several synchronized frequencies within a band at the transmitter and reassembles the information at the receiver, was first approved for Amateur Radio in 1985 for bands above 225 MHz, and there has been some experimental amateur operation since then.

The petition proposes that the FCC permit brief test spread-spectrum transmissions and allow international spread-spectrum communications between amateurs in the US and those in countries that permit hams to use spread-spectrum techniques. The current rules allow only domestic communication. The petition also asks for automatic power-control provisions to insure use of minimum necessary power to conduct spread-spectrum communication and limit the potential for interference to narrowband modes. The petition does not ask for any changes in frequency restrictions on SS emissions, the 100 watt power limit or logging and identification requirements.

In urging the FCC to adopt the changes, the League's petition calls the proposals the minimum necessary changes in order to foster SS experimentation in the Amateur Service.

ARLB109 FCC Vanity Call Sign

FCC vanity call sign application Form 610V is now available, but the FCC is not yet accepting completed forms for filing.

In response to requests by radio amateurs, the ARRL has mailed 9000 copies of the form. If you requested one from the ARRL and do not receive it by December 16, call 860-594-0300.

The FCC is expected to announce opening dates for the first vanity call sign filing gate in early 1996. You can obtain FCC Form 610V (along with FCC form 1070V and FCC vanity call sign information fact sheet PR 9000, number 206v) by writing ARRL, 225 Main Street, Newington, CT 06111. Please include an SASE.

Form 610v also is available from the FCC via the internet at <http://www.fcc.gov/Forms/Form610V> or <ftp://ftp.fcc.gov/pub/Forms/Form610V/>, or by fax at 202-418-0177. Ask for Form 006108.

The FCC Forms Distribution Center will accept orders in about one month. Call 800-418-3676.

SETI

The nonprofit Search for Extra Terrestrial Intelligence League has entered into an agreement with Down East Microwave Inc. The company, owned by Steve Kostro, N2CEI since 1994, is located in Frenchtown, New Jersey, and manufactures equipment for amateurs for 6 meters and above.

Under the agreement Down East Microwave will produce and market amplifiers, filters, down-converters, and other receive equipment designed by SETI League engineers, with profits to be donated to the SETI League's research fund.

Kostro says that radio amateurs are in a unique position to succeed where government agencies have thus far failed. SETI is no longer science fiction, says Kostro. It is mainstream science, and Down East Microwave is pleased to have a role in this important research.

CB Is Still Alive....

If you think that 11 meter CB is dead, you're wrong. It's alive and growing almost as fast as the early 1970's. Several of the major on-line services are now dedicating space to Class D 11 meter citizens radio operators and a number of publications dedicated to day to day CB operation are starting to appear. One of the newest and most popular is the new Popular Communications CB Radio Buyers Guide.

More than just a lot of ads and pretty pictures of radios, the Pop Comm "CB Radio Buyer's Guide" offers 17 articles that cover everything from handles to antenna safety. Contributing authors are well known people such as Tom Kneitel, Bill Price, and Jock Elliott. The publication includes comprehensive product listings and a guide to the growing number of CB radio manufacturers and dealers.

H-2782 Summary.....

Repeater Report....de N1NVL

(Continued from page 3)

applicability of the state zoning law. Most of them are quite familiar with its provisions as they deal with it routinely

Presumably, now that local officials and Amateur Radio operators seeking to erect towers can gree on what the law says, what exactly does it mean? This is what I think Chapter 225 of the Acts of 1995 says:

1) A city or town may not lawfully enact or enforce a zoning ordinance or by-law which prohibits the construction or use of an antenna structure by a federally licensed Amateur Radio operator. Thus, a city or town probably cannot prohibit Amateur Radio towers by adopting a "no towers here"-type ordinance or by-law.

2) While zoning ordinances and by-laws MAY restrict the height and location of antenna structures, the cities and towns enacting the ordinances and by-laws must do the following:

- a) base their restrictions on health, safety or aesthetic (appearance) criteria,
- b) reasonably allow sufficient height of such antenna structures so as to effectively accommodate Amateur Radio communications, and
- c) make the restrictions in such a way as to constitute the minimum practicable regulation which will accomplish the legitimate [health, safety or aesthetic] purposes of the city or town.

The Act limits only ZONING ordinances and by-laws. It does not affect building codes, electrical codes, fire codes, health codes or the like, which may be in effect. It also does not affect restrictive covenants (i.e. restrictions upon the possible uses of land, mandated by previous owners of the land). It specifically does not affect restrictions adopted by architectural or historic district commissions.

The Act does not eliminate the requirement of obtaining a building permit before erecting an "antenna mast" (in the words of the state building code), or other structure.

The Act is not a "carte blanche" to put up whatever antenna structure one wants, simply because he or she is a federally licensed amateur radio operator. It should, however, overcome some of the seemingly arbitrary height limitations, contained in most zoning ordinances and by-laws, which have been so frustrating to so many hams. It may, also, have some application in overcoming other restrictions.

The Act applies only to antenna structures used by federally licensed Amateur Radio operators.

The H-2782 summary was taken from the Web page of K3HI. The MMRA adds its thanks to all those who made this happen, and to the ARRL Section Staff for keeping us all well informed about progress.

146.820 KA1AL/R Weston, MA

Recently 82 has been exhibiting poor receive sensitivity. The loss of sensitivity was actually some desense in the duplexer of the repeater. For those not familiar with the term desense is when some of the RF from the transmitter gets into the receiver causing the first stages to overload and ignore weak signals. Close in stations can get in but far off, weak ones get intermittent coverage. Just as they start to access the machine they appear to get cut out as if someone were keying over them. The cause seems to be a bad "T" harness on the duplexer. This harness splits signals between the transmit and receive sides of the duplexers. A temporary fix was put in place and the connectors cleaned up. A new "T" harness has to be made up, and the duplexer needs retuning. For now it's running fairly well. I expect to be rebuilding this harness during this snowstorm and replacing it sometime before the week of Jan 7th is out.

449.575 N1NVL/R Taunton, MA

Before Christmas a crew went down to Taunton to re-install the repeater. Bob, WA1ZJE, Armando, N1TYG, Ed, N1OM, and Bill, WA1NLR braved the cold to put up the antenna and get the machine on the air. If I missed a name, forgive me. They were lucky - there was not much wind. That funny sound on the link is the fan on the power amp inducing noise on the link radio. It should be fixed fairly soon - a little filtering ought to do it.

146.715 N1NVL/R Stoneham, MA

This machine has now found a new way to act up. If you talk loud and your deviation runs up around 4Khz-5Khz, the receiver cuts you out. If you talk quiet and back off the mic, everything works fine. Go Figure! Anyway this little gem is being looked at and I should be back to the site soon to see what can be done.

Minuteman Articles — Solicitation

If you have ever built anything, fixed something, or have an experience that you want to share, then you should submit an article to the MMRA Minuteman. Contact Andy Morrison, N1BHI if you want to talk about it. We can scan artwork and schematics to make an article more interesting and useful. Give it a try!



MINUTEMAN REPEATER ASSOCIATION

P.O. BOX 381 --- HUDSON, MA. 01749



WIPRI - REPEAT

SEPTEMBER 1971

OM—Two months into the flight and here's what's happened since our last QSO. The August 21 move from WIPRI's basement to Weston College went off without a hitch. An honest attempt to keep the rig on the air was considered but finally it was decided to shut-down for a few days in the interest of more permanently packaging the RF rack, the logic rack and improving the interconnecting cables.

A few nights later the repeater went back on, transmitting well but a little hard of hearing. The parts for our duplexer were held up at the plating shop, so we operated through a separate receiving antenna temporarily. Through the night's of August 27 and 28 the duplexer was constructed and rough tuned and on Sunday we were back in operation with equal transmitting-receiving capability.

The name of the game since then has been, and will continue to be, optimising the performance of the repeater at its present site with current projects including the final duplexer tuning, installing a new 6db Hy-Gain antenna and final debugging of the auto-patch—which, by the way, has been on the air.

This and the material on page 7 were excerpted from the September 1971 issue of the Minuteman....just after the Weston 146.82 repeater was born. The original was typed with a machine that used the Courier font. This reproduction changes only the font — everything else is exactly as it was printed 25 years ago....we've come a long way, from one repeater to 10!

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Give the MMRA World Wide Web Home Page a try.... let us know what you think.... any ideas are welcome. We are looking into things like an MMRA list server. We now have our own domain name - mmra.org. The Web Page keeps getting better.....

WWW Address:

<http://www.mmra.org/~mmra/mmrainfo.html>

146.82 Repeater Logic Description — September 1971 Minuteman

John, WA1NPN

By now most of our members are aware that the repeater is controlled by some form of logic. It is my attempt in this short article to familiarize you with the present logic system.

The initial control circuitry began to take shape in the basement at 715 Winter St. over 2 months ago. It has grown since then, and with the help of others has blossomed into a relatively large solid state controller.

The prototype system, consisting of the ID control, timers, and logging control was debugged as much as possible in Holliston and then on the big day (16 July) was transported to Derby Lane where it was placed in W1PRI's (Bob's) shack. Many hours were spent interfacing the logic to the RF gear but at last we had a system we could call a repeater.

Since the prototype began functioning many problems have been eliminated and some of the control circuits modified to provide more efficient operation.

The system as it stands today consists of a logging control circuit, an ID generator, an ID control with timer, and soon to come, a 4 digit access code for the autopatch with protection against toll calls billed to the repeater, a deviation monitor and an off frequency indicator.

A brief description of some of the controls follows to show you what happens when you key the repeater.

As you drop your carrier a 30 second timer starts and if there is no additional keying for 30 seconds the logic assumes the repeater to be idle. The next carrier received is examined for 1 second (hence the button pusher delay). The recorder is then activated and will record providing the carrier remains active for up to 10 seconds. If you should drop your carrier in 5 seconds it will shut off the recorder after the station called has been recorded. The logic remembers that it has recorded a transmission and it waits for the CHU marker pulse and restarts the recorder to log the time of day. After the recorder shuts down the logic waits for the idle repeater condition again and again restarts the recorder to log the time. The operation records the initial call and time, and sign off time.

The ID generator assembles the code word W1PRI and keys the oscillator to provide the signal. The ID control contains a 3 minute timer which starts after the ID has played. The timer runs for 3 minutes irregardless of repeater activity. When it times out the logic waits for the next drop in carrier, to start the ID generator. The carrier operated relay logic turns the 82 transmitter on when a signal is present on 22. The tail timer controls the width of the squelch tail.

The auto-patch control has been temporarily modified so that it can be keyed on with a 1477 Hz signal of 1-1/2 seconds duration. However, when the touchtone decoder and associated logic is debugged, the 4 digit access code will be necessary to use the auto-patch. Presently a 1 1/2 second burst of 1477 Hz (3 & 6 on the touchtone pad) will activate the auto-patch.

If the patch is active a timer is triggered when a carrier is dropped. This timer will timeout if the repeater is not keyed for 30 seconds. The timer is defeated if keyed within this period. If you make a call and the telephone party holds a conversation approaching 30 seconds you can recycle the timer by keying the repeater. If for any reason the logic terminates the call, the ID will play before the transmitter shuts down. If the operator should intervene do not give her the repeater telephone number—any 891XXXX will do.

The future holds many things for the control logic...remote receivers, transmitters, selective telephone exchange, and many more.

Ralph, WA1DNG, has done a great deal of circuit design and has also spent time on the touchtone decoder which will make our 4 digit access possible in the near future. Ray, W1IRH, has made the audio throughput the repeater as clean as with his audio summing board. There is still a large amount of work to be done documenting the logic. Anyone interested in drafting some logic schematics can get in touch with me, your help would be appreciated.

In closing, I will offer my training services to anyone who desires to learn more about the logic. Contact myself or Ralph, WA1DNG.

Our controllers today are somewhat more sophisticated than the one described above....but all that sophistication began back then. Just look at what that controller did — all built with TTL (transistor to transistor logic). Today we have it easy....if something in the controller program isn't right, we just change the program. But in 1971 if you had a problem you had to re-wire a board to make the logic behave differently to correct it.

We wonder if any of the original documentation that John referred to is still around...it might be interesting for some of the more technically minded guys to see it. The functions performed by that design were built into a series of controllers conceived and implemented by Bob Clements, K1BC. For years three of them — 146.82, 146.61 and 449.925 — served without a glitch. They were bullet proof, surviving extreme temperature swings, lightening hits — you name it. They were based on Z80 processors; their programs were "burned" into Eprom chips. We still have the original source code; Bob's programs were soundly designed and well documented.

In the last 5 or so years, we have moved up to a series of controllers manufactured by SCOM Industries in Colorado. These controllers have integrated autopatches, voice synthesis, multiple logic inputs and outputs and a sophisticated Macro programming capability. Scott Bullock, KA1CLX, implemented the first SCOM 7K at 449.925, building the macros that formed the basis of the programs that run our controllers today. Enhancements have been made by Walter, N1HBR, Chris, N1NVL, and Andy, N1BHI.

All this makes one wonder....what will it be like in 2020? What will ham radio be like then? What will the technologies we use look like.....it's gonna be interesting.

Amateur Radio Flea Sale

Sponsored by The Minuteman Repeater Association

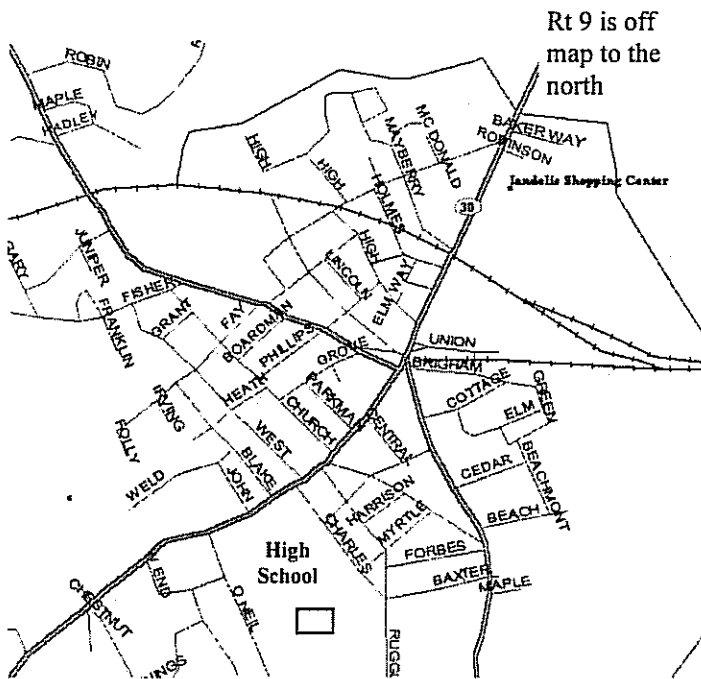
For Information or reservations call:

MMRA Voice Mail: 508-489-2282 — or

Andy Morrison, N1BHI: 508-481-3878 — or

WWW Home Page: <http://www.ultranet.com/~mmra/mmrainfo.html> — or

Email to: alm@n1bhi.ultranet.com



Directions:

Take Rt 495 to Rt 9 west. From the intersection of Rt. 9 and 30, take route 30 "West" (goes south from Rt. 9). About 1 mile south you come into Westboro Center, entering a traffic circle. Go as straight as possible through the center, continuing on Rt. 30. As you approach the High School, you will see Church steeples right and left. The High School is just beyond the churches on the left.

Westboro High School
Saturday, March 16, 1996
1000 - 1400 Hrs for Buyers
Open at 0800 for Sellers

General Admission: \$2.00

TABLES

	Before March 10	After March 10
5 foot table (1/2 of 10 foot)	\$7.50	\$11.00
8 foot table	\$12.00	\$18.00
10 foot table	\$15.00	\$22.00
Floor Space (BYO Table)	\$.75 per foot 3 foot width	\$1.25 per foot 3 foot width

Featured Vendor: *Lentini Communications* of Newington, CT. A Flea Market Special may be available.

Minuteman Repeater Association, Inc.
P. O. Box 2282
Lexington, MA 02173
Voice Mailbox: (508) 489-2282

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

-Application for Membership-

☐ New or ☐ Renewal

☐ Individual Membership (Dues \$25 per year)

☐ Family Membership (Dues: \$35 per year)

☐ 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 by-laws, and understand that acceptance of this application entitles me to all rights and privileges of membership as provided under the by-laws.

Signature: _____ Date: _____

Name: _____ Callsign: _____ Class of License: _____

Home Address: _____

E-Mail Address: _____

Occupation: _____ Employer: _____

Work Phone#: _____ Home Phone: _____

Member of: _____ ARRL? _____ Other Clubs? _____

Equipment Available for Your Use:

Type	No.	Mobile	Port.	Fixed	DTMF	FM	SSB	Packet	CW	Patch	Rtty
HF	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VHF	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
UHF	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I can and am willing to assist/serve the Association and/or help maintain the Repeaters in the following ways (check all appropriate boxes)

- | | | |
|---|---|--|
| <input type="checkbox"/> Antennas | <input type="checkbox"/> Technical Documentation | <input type="checkbox"/> Teach Code |
| <input type="checkbox"/> Flea Market | <input type="checkbox"/> Shelters | <input type="checkbox"/> Teach Theory |
| <input type="checkbox"/> Receiver | <input type="checkbox"/> Medical Aid | <input type="checkbox"/> Repeater Tech Committee |
| <input type="checkbox"/> Publicity | <input type="checkbox"/> Equipment Construction | <input type="checkbox"/> Special Projects |
| <input type="checkbox"/> Transmitters | <input type="checkbox"/> Meeting Set-up | <input type="checkbox"/> Repeater Control Operator |
| <input type="checkbox"/> Newsletter | <input type="checkbox"/> Equipment Transportation | <input type="checkbox"/> Association Officer |
| <input type="checkbox"/> Logic | <input type="checkbox"/> Social Events | <input type="checkbox"/> Board of Directors |
| <input type="checkbox"/> Public Service | <input type="checkbox"/> Technical Documentation | <input type="checkbox"/> Field Day |
| <input type="checkbox"/> Telephone | <input type="checkbox"/> Refreshment | <input type="checkbox"/> Emergency Communications |
| <input type="checkbox"/> Legal Aid | <input type="checkbox"/> Schematic Drawing | <input type="checkbox"/> CW Operation |
| <input type="checkbox"/> Education: | <input type="checkbox"/> Technical Library | Other-Specify: _____ |

Send this form with your

Dues to: MMRA, PO Box 2282, Lexington, MA 02173

MMRA Information - Repeaters, Officers and Board Members

MMRA Repeaters:

Marlboro	146.61	N1BHI/R	FTL	P	
Marlboro	449.925	N1HBR/R	FTL	P	PL - 88.5 out, none in
Quincy	146.67	KA1HKP/R	PTL	P	
Quincy	224.40	N1KUG/R	FTL	L	PL - 103.5 in, none out
Weston	146.82	KA1AL/R	PTL	P	PL - 146.2 out, none in
Weston	224.70	N1HBR/R	FTL	L	
Hopkinton	223.94	N1BHI/R	FTL	L	PL - 103.5 in and out
Stoneham	146.715	N1NVL/R	PTL	P	PL - 146.2 out, none in.
Stoneham	446.725	N1NVK/R	PTL	L	PL - 88.5 in, none out
Taunton	449.575	N1NVL/R	FTL	L	PL - 88.5 in, none out

[FTL = Full Time Linked] PTL = Part Time Linked]

[L = Patch available via link] P = Local Autopatch]

MMRA Officers:

President:	Andy Morrison, N1BHI
Vice President:	Clark Conti, N1NVK
Secretary:	David Croll, KT1X
Treasurer:	Ian MacLennon, AF1R
Clerk:	Ed Mulhern, N1NOM
Directors:	Tom Qualtieri, WB1GMA
	Al Kunian, KA1AL
	Chris Conti, N1NVL
	Bob Feltmate, WA1ZJE
	Andy Morrison, N1BHI
	Walter Ching, N1HBR

Newsletter Editor:

Associate Editor:

Important MMRA Club Information:

Membership Meetings:

3rd Wed of Sept, Nov, Jan, Mar, May at Campion Center, Weston at 7:30 PM
Meeting Dates for 1995-96 Season: September 20, November 15, January 17, March 20, & May 15.

Board Meetings:

3rd Wed of Oct, Dec, Feb, Apr. Meetings are open and members are welcome.

If a visiting member wants to be on the agenda, please contact Andy Morrison beforehand.

MMRA Voice Mailbox

Newsletter Information

Mailing Date

Submission Deadline

<u>September issue</u>	<u>November issue</u>	<u>January Issue</u>	<u>March Issue</u>	<u>May issue</u>
Sept 14, 1995	Nov 9, 1995	Jan 11, 1996	Mar 8, 1996	May 10, 1996
Sept 1, 1995	Oct 26, 1995	Dec 28, 1995	Feb 22, 1996	Apr 26, 1996

The MMRA is dedicated to Amateur Radio and the public service. The MMRA is a registered non-profit Massachusetts corporation. Membership is open to all amateurs. Annual dues are \$25.00 individual, \$35.00 family.

Mail Return Address:

MMRA

P.O. Box 2282

Lexington, MA 02173

TO:

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