The Minuteman

Volume 25 Issue 2 November 1995

Twenty-Fifth Anniversary Issue

Twenty-Five years ago, a small group of hams got together and formed what became todays MMRA. This issue is dedicated to that event....you will see some memorabilia from the early days, and read a little history. A lot of what you will see came to us from George Palmer, W1AQI, and Jack Clayton, WA1OQK. Both members of the original group, they came across a pile of stuff from the first year of the MMRA's life. So take a look inside to see what the very first issue of the Minuteman looked like. We think you will enjoy it. Anyone else who has memorabilia, get in touch!

November Meeting Program

November's guest speaker will be Tom Kinehan, N1CPE, who will be showing the latest improvements in one of the most popular applications for packet radio, APRS.

APRS is a combination of packet communications, mapping software and automatic update reporting especially suited to plotting events in real time. It is used for the Boston Marathon to track runners and logistic assets (busses). APRS is also in Skywarn to follow fronts and storm tracks, and on the cluster it literally puts spots on the map, showing you ducts, sporadic E and similar phenomenon.

Anyone interested in storm tracking, race watching, cluster monitoring, or just anyone who has a TNC collecting dust because they don't get any excitement from bulletin boards, should plan to attend.

NOVEMBER MEMBERSHIP MEETING

WEDNESDAY, NOV 15, 1995 - 1930 HRS
CAMPION CENTER, WESTON MA
PROGRAM:

APRS
Tom Kinehan, N1CPE

Raffle

The "PL" Controversy.....Issues and Answers.

Since we first began talking about putting PL on the input of our repeaters, we have been hearing from members, both for and against. It's important that we make one thing clear to everyone: **The MMRA will not do anything that makes a member without PL on his radio's output unable to access our 2 meter repeaters.** If we implement PL, we will find a way to do it that allows a member without PL to disable tone squelch at the repeater for the duration of his use of the machine. **If we cannot find a practical way to do it, we won't.**

The technical crew has been thinking about this for a long time; here are the issues that have been discussed:

- The amount of RF that emanates from commercial radio systems has increased in the last 10 years in staggering proportions. Intermod from fixed and mobile operation has become a problem. In order to allow our users to listen to our repeaters without having to listen also to the garbage that opens mobile radio squelches, we added PL on the output of 146.82 and 146.715.
- Our repeaters often hear the same garbage...and they transmit in response to RF presence on their inputs. We've heard our systems "pumped" repeatedly for hours by transient intermod that comes and goes with changing local conditions and even tropospheric ducting. *This "pumping" takes life out of our repeaters, reducing the time between failures. This increases maintenance effort and cost.*
- If we add tone squelch to all our repeaters' inputs, these conditions will be alleviated.
- We also know that some of the membership might still possess radios that do not have PL output capability. We have delayed PL for over 5 years because of this. It first came up as we began linking repeaters. We decided against it because it would adversely affect some of our members.
- Since the problems mentioned above have become more prevalent, we have started working on how to activate PL without inconveniencing the membership. Part of our strategy in accomplishing this was the installation of modern controllers that can be programmed to do things based on DTMF codes sent by users. While this was not the driving force behind moving up to new controllers, it was an important consideration.
- Since we are now technically capable of doing something, we have discussed ways to implement PL. The approach that we thought might be the best involves using DTMF to enable a user to access a repeater if he does not have PL. It might work something like this: The user would send a DTMF sequence to the repeater that would *disable* PL. As long as there is activity on the machine, PL would remain disabled. After the activity stops and a short period time elapses, PL would re-activate automatically.
- Technology has produced tone encode-decode devices that can fit into microphones or small niches inside a radio. They are inexpensive and easy to install. We have thought about the possibility of making a quantity purchase on behalf of members who want to have PL on older rigs. This might reduce an already low cost to a very reasonable level.
- In addition to a quantity purchase of PL chips, we have considered having a workshop that would be run by our tech committee to assist members who want help to install the PL capability in their radios.

All these ideas have been kicked around for a long time. We need to hear from you, the members. There are several ways you can get your thoughts to us:

- Use the Internet—send us Email at mmra@mmra.org.
- Check into the Tuesday night net and talk about it there. That would be a good forum; a good discussion might get going. Our net controllers will begin asking specifically for people who have something to say about PL.
- Send a letter....a couple of people have already done this.
- When you hear N1BHI, N1NVL, N1NVK, KT1X, AF1R, KA1AL, WA1ZJE, WB1GMA or N1NOM on the air, jump in and let us know what you think.
- Leave a message on our MMRA Hotline (508-489-2282). It's contents will be Emailed to members of the board and officers.

In the next newsletter issue, we'll publish a compendium of the response we've gotten. Don't sit out there silent...this is **your** club, and **your** repeaters.

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

If you are a 94-95 member who has not renewed, this is the last newsletter you will receive. To continue getting the Minuteman, renew now! The MMRA does not want to lose your support.

Float Charge Controller for Lead-Acid Storage Batteries

By Clark Conti - N1NVK

Here is another one evening project anyone can build.

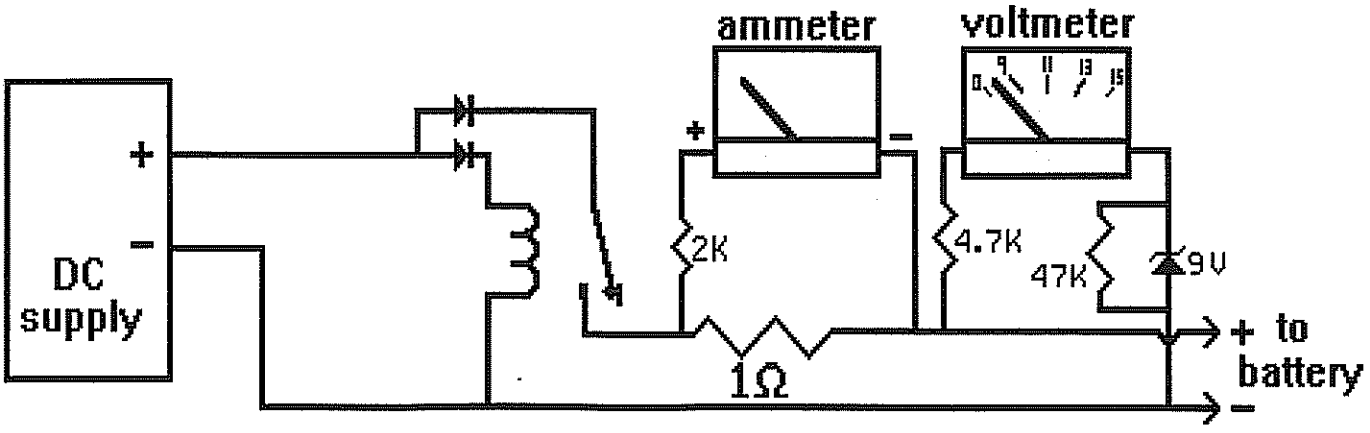
This circuit is designed to maintain a float charge on storage batteries like marine deep cycle and sealed gel/lead types. I originally built the circuit without the meters for my cell phone, but it worked so well that I built more for my home back-up radio supply, and one with a lighter plug and 2Ah for my fox hunting gear. At home I am using a small charging supply with a 100Ah 12v storage battery to power my rigs.

The 1 ohm resistor limits the charging current to about 2 amps since the battery rarely drops below 10 volts, but just in case I included a 2.5A fuse. The diodes prevent the relay from holding in when the charge source drops out. Without the relay providing full isolation, the battery can drain into the charger. I first discovered this because the lighter in my new car is not live without the ignition on. The first time I got everything hooked up and switched the car off, the AM/FM radio kept playing by drawing current from the transportable phone's internal battery through the lighter socket. It was a confusing moment to say the least, but if I hadn't stopped to figure it out, I probably would have ruined the phone battery by draining it dry.

In the home version the meters have been added. To monitor charging current I measure a 0-2 volt drop across the 1 ohm limiting resistor, and the volt meter has had the scale expanded from 9-16 volts by adding the zener diode / resistor combination shown. I used 1mA meters because I always have plenty of them around, (I build them for a living) I added resistors of 1000 ohm/volt, 2K for the current, and 4.7K +47K parallel with the zener for the split range. If you don't have this type of meter you can recalculate for whatever you have, or skip them altogether, but don't leave out the 1 ohm resistor unless the charging source is current limited!

Remember this circuit was designed for float charge only, and will not provide equalization, or run hi/low charge configurations. DO NOT use this with NiCad batteries as they don't like float chargers. As for equalization, lead-acid cells occasionally like to be charged at a slightly higher voltage, usually 14.5 to 15.5 for about half an hour a month, which balances or equalizes the charge across all the cells. This should be done manually for longest battery life. Failure to do so will cause individual cells to break down an become weak. (I also make battery cell testers, just in case you want to check old batteries.)

CUL de Clark, N1NVK



CAN DO!

We were all surprised with the lackluster performance of the 449.575 (Taunton) repeater after its many years of excellent service as the worldnet 10m link. It seamed to have intermittent symptoms of poor sensitivity and low transmit power.

We took it off the Taunton site back in the summer and moved it to Weston so that we could look at it on the bench while it was operating, Here we noticed that it sometimes seemed to key up the network link, especially when the power was low. This generally indicates drifting and/or spurs in the transmitter. Unfortunately it never seemed to happen when someone was standing there watching, so at the close of the September meeting Brian KA1YQB decided to take it home and give it a full tune-up. He reworked the cables, replacing anything that looked worn and mounted the whole thing, including the new 50W power amp in a nice small rack, and in the process found the problem.

One of the resonant cavities, commonly called "cans" had come unsoldered causing severe detuning at the slightest movement or temperature change. The leak was also making "crunchies" and most likely the much dreaded spurs as well. The tuning was just bad enough that the can would heat itself up and further distort, causing more self-heating, more detuning, etc..

The next day he put in a call to the manufacturer, and got an estimate of $75 to $125 for repair or $150 for a replacement. They explained that it was a very special labor intensive product,

(Continued on page 6)

25 Years Ago, It Looked Like This:

This is what the very first newsletter of the MMRA looked like. Look at the list of officers below...The first trustee of 146.82 was Bob Waters, also the Vice-President. George, W1AQI, then President, is the guy whose efforts made this material available to us. Steve Rudin, W1WSN, gave a talk at one of our meetings about the early days of the MMRA. We hope to be able to get him to write a few articles for us about how the organization began and grew. We might even get Bob Waters to contribute; you'll hear Bob once in a while on '82 or '61.

It was a different back then....repeaters were relatively new, and guys used re-furbished commercial VHF rigs — Motorola, GE and others. They were big — mobile boat anchors. Most had to be trunk mounted with remotes mounted under the dash. The remotes were as big as some of the rigs we use today, and they only switched a few channels. The rigs were all crystal controlled, and those who used them had to get crystals and retune transmitters and receivers to work down on the amateur two meter band. The repeaters also were cludged together from mobile or base transceivers.

In the early days, CW id generators were often made sort of like a player piano. physical motion was translated into varied duration switching to generate a CW identifier.

Back in those days people built their own duplexers — the large cylindrical "cans" that allow a transmitter and receiver working simultaneously to share the same antenna.

In those days, just about everyone was very much involved in the work to build and maintain the repeater systems. It was new, and everyone was eager to be in on the fun.

If you were around during the late 70's and early 80's, you may have been at MMRA election meetings and listened to guys actually give speeches, campaigning for office!

There was a lot of participation in the newsletter....just about every issue had a couple of technical articles from members. We'll reprint some of those this year; on the next page is one written by Bob Waters. We'd like to see more of this from everyone!

AUGUST 1971

OM---22-82 is alive and growing. On 16 July 1971 at approximately 0035 EDT, our new repeater was given a smack on the rump and it squeaked out its first transmitted ID-W1PRI. Like any youngster, its first few weeks of operation was a little shakey. Now, just a few short weeks later, its voice is being heard and maturity is in sight. The total repeater system is going to be a good one--one that we, as members of the Minuteman Repeater Association, can work and talk about with a great deal of pride.

A repeater is only a machine and the better it is, the more ravenous it is. It can subsist only if the supporting association is strong, loyal in financial obligations, and generous in the donation of time and talent.

So--what do we do? Well, if you are a member of our association keep your dues paid up. Dues are payable one year from the time you last paid. If you're not a member, contact K1CCK and join--what better time is there than to get in on the ground floor and support a new association and repeater system. Finally offer your help--its immaterial what your "thing" is, we can use you. Contact K1NZQ or WA1NPN.

The roster of elected officers of the Minuteman Repeater Association is listed below:

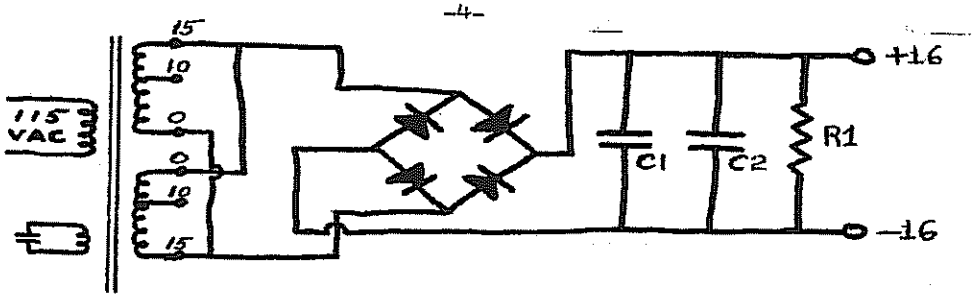
PRESIDENT---------Steve Rudin, W1WSN
VICE-PRESIDENT----Bob Waters, W1PRI
SECRETARY---------George Palmer, W1AQI
TREASURER---------Ken Powers, K1CCK
CLERK-------------Paul Zoderman, K1JDF
DIRECTORS---------Gene Herman, W1EZA
Al Muise, K1NZQ
Joe Shenette, K1WPO
John Pratt, WA1NPN

The comments above apply to the MMRA just as much now as they did then. We are a lot bigger, but we still need the support of every member from year to year—both financial and talent.

POWER SUPPLIES

FROM BOB WATERS, W1PRI

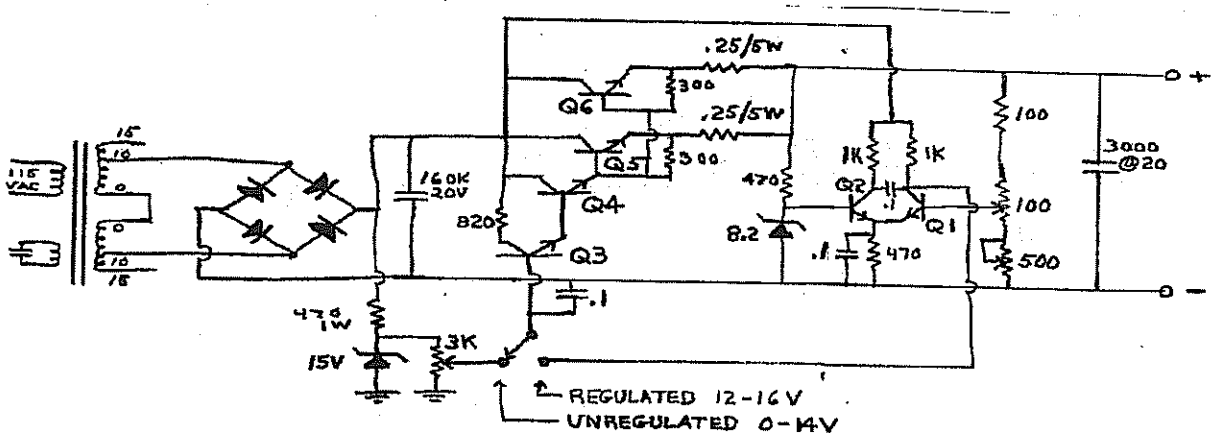
"Two meter FM, transistors and logic all seem to have come together at one time, making us aware of the need for good low voltage, high current regulated DC supplies. After all, who wants to be bothered with a storage battery in the shack.. they're never charged and the acid puts water in the rug! MMRA has been able to obtain some very good "surplus" AC/DC supplies. These units have a resonant type regulating transformer that has two separate secondary windings...0-10, 15 volts at 8 amperes. In addition, the supplies have a rectifier that has four diodes with connections available to permit use as either 2 full-wave rectifiers or as a bridge. In the simplest form, the supplies are used as brute force, bridge rectifiers with an output of plus 16 volts and a current rating of 8 to 10 amps. The regulation is good enough to run the usual transistor type transceiver such as Regency, IC-20, etc.



C1, C2 - 160,000 @ 20V
R1 - 15Ω, 25W

On receive, the voltage is just under 16V but don't worry about your rig; it has Zener regulation that drops the voltage on the transistors. On transmit, drawing 2 or 3 amperes, the voltage of the supply is about 14.5, a totally safe value for all cigar boxes. For those who like to experiment in the shack with the new logic packages, it is possible to reconnect the taps to get 5 volts, and for the op-amp boys, you can have both plus and minus 15 volts simultaneously.

Here in my shack, I wanted to have a super-regulated job with variable voltage output (for some of my screwdriver experiments). Using the MMRA special, here's how it came out.



Construction of the regulator is simple. All resistors are 1/2 watt carbon, unless marked otherwise. The output transistors, Q5 and Q6 must be on a large aluminum heat sink, 4" x 4" using insulating washers and silicone grease. The other transistors and resistors can be made up on a circuit board or on perforated vector board."

The above article was originally published in Volume 1, Issue 5, December, 1971. The design is still applicable today, and would serve just as well now as it did for Bob 25 years ago....

The President's Corner.....

The editor didn't leave me much room this month....I'll have to complain to the management.... I hope you enjoy the material from the days of yesteryear. I was really very pleased when George Palmer (W1AQI) showed me a sample of it and told me that there was a lot more available.

One of the things that kind of stands out is that the newsletters of 1971 started a tradition of quality content that the MMRA has maintained pretty successfully....at least we hope you think so. The only real difference is that modern desktop publishing tools have made it easy to produce a fairly professional looking rag.

But what really stands out as I peruse the pile of stuff from George, Jack and Al (all members of the 147.27 gang) is the enthusiasm for the hobby and the organization that existed back then. Sometimes I wonder where all that energy went....we just do not get the same level of participation that started the MMRA.

I suppose there are a lot of reasons why that should be so; like any other hobby or interest, ham radio has gotten "old" to a lot of people. That, along with the pressures of living in the nineties, makes it hard for people to devote as much time as they used to. Priorities change and we move on to other things, relegating ham radio pursuits to a background activity. We are very lucky that there are some new people who have jumped in, and that there are a few diehards who continue to lend their time and expertise to furthering the hobby.

The relative newcomers who give of their time to the group are all appreciative of those whose support has become limited to loyal maintenance of membership. And there have been times when people came out of the woodwork to help when the feces hit the fan blades....enough times to give the active workers pride in the organization they serve.

The key to it all is learning, communicating, helping others and having some fun along the way. That's what most hobbies are all about...and this is a specially good one.

Can Do.....

(Continued from page 3)

and offered a ham discount, but it is still a lot of green. Figuring on replacement as the best course of action, Brian and I decided we had absolutely nothing to lose if we tried to fix the old one ourselves, even if it might never tune up right again, after all these tuned cavity things are pretty tricky, RIGHT?

In fact cans are very simple basic devices that can be made from scratch, and if built solidly can tune and maintain excellent stability for years. What else could any self respecting, penny-pinching ham do? We grabbed a hammer and a screwdriver and finished breaking off the already broken end. Using a rather odd set of tools for radio work, like a drill, wire brush, and dremel tool with a dental smoothing bit, we removed all of the old solder, and prepared the can for re-assembly. We then started heating the can very slowly with a propane torch and soldered the can back together forming a RF leak-proof seal.

After tuning the can we found the repeater was back to or better than its old self with no self-heating at all. Brian then spent the next few days replacing the internal RG58 jumpers and power amplifier connectors with semi-rigid co-ax to keep leaks and losses to near zero. Then, for the finishing touch I added a racing stripe to the can to make it look as cool as it worked. End result, 0.1 uV/m receive with 50W out ... NOT BAD!

We plan to have this repeater back on-line in the Taunton area soon! We are just waiting for some cold rainy or snowy day. After all...every ham knows winter is the only time to put up antennas...

We need more of this kind of involvement from people! Bryan and Clark both do a lot for the association; you could too — more people doing stuff means less time per person to get things done. If you have the ability and a little time, help us out....get in touch!

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

Hamfests....ARRL Listing as of 10-23-95 as downloaded from ARRL Web Page.....

April 21
May 19
June 16
July 21
August 18
x MIT RS & Harvard Wireless Club, Camb, MA
Steve Finberg, W1GSL
PO Box 397082, MIT Branch, Cambridge, MA 02139
Nick Alternburnd, KA1MQX, 617-253-3776

November 12
+ Eastern CT ARA, Putnam, CT
Mike Therrien, MD, N1OPZ
476 River Rd., Putnam, CT 06260
203-928-7151

January 13
+ Skyline ARC, Marathon, NY
Barb Mudge, KB2TIK
3364 Rt. 221 West, Marathon, NY 13045
607-849-6751

January 21
+ Metro 70cm Network, Yonkers, NY
Otto Supliski, WB2SLQ
53 Hayward St., Yonkers, NY 10704
914-969-1053

May 5
x Metro 70cm Network, Yonkers, NY
Otto Supliski, WB2SLQ
53 Hayward St., Yonkers, NY 10704
914-969-1053

May 31-June 2
* Atlantic Division/New York State Convention, Rochester, NY
Harold Smith, K2HC
300 White Spruce Blvd., Rochester, NY 14623
716-424-7184

*** = Conventions + = ARRL Hamfest x = Non-ARRL Hamfest**

The MMRA is planning a Flea Market for March or April. The exact date will depend on the availability of the Westboro High School facilities. Watch for an announcement soon.....

Fox Hunting Becomes an Obsession.....

When we started our weekly fox-hunts we had no idea that it would become so much fun. When we started, there was only one doppler system — that owned by the MMRA, for use in interference situations. If you don't believe our group takes it seriously, you might change your mind when you learn that there are now four other doppler systems being used by our group. Ed, N1NOM, Bill, N1QPR, Stu, W1UVE, and Clark, N1NVK, have acquired them. Andy, N1BHI, and Walter, N1HBR, pioneered use of these systems three years ago....Walter even wrote a computer program that listens to information coming from the doppler and produces a graphics display along with filtering that all but eliminates the ambiguity produced by multi-path phenomena. Bill, N1QPR, is working on his own version of a program to do the same thing.

Early this year Bryan, KA1YQB, built a "FoxBox" — a transmitter, battery, digital audio recorder and timing logic in an old ammunition box. Every couple of weeks it gets moved to a new location, and rather well hidden....the photo on the left shows the FoxBox....well, if you look closely, you can see the antenna sticking up out of a pile of leaves...organic detritus as N1BHI characterizes it. The FoxBox transmits every 5 minutes on 145.63 MHz for 30 seconds. Hunters barge around the landscape looking for it, and have a lot of fun in the process.

Every Saturday morning, the group hunts a live fox. Whoever found the fox the previous Saturday hides for the next hunt. If you don't believe we take fox hunting seriously, look at N1BHI administering the coup de grace to Dave's (KT1X) automobile. We figured that if we killed his car, he would go out and buy a "manly vehicle." N1NOM furnished the cutlery and the photos....

If you've never tried it, we exhort you to come out and hunt either a live fox or the FoxBox. The group is growing in size and expertise, so join in and have a little fun. The Saturday hunts start at 10 AM, and use one of our 2 meter systems each week.

Items of Interest.....

ARRL EMA SECTION MANAGER
WATERTOWN, MA
OCTOBER 19, 1995
EMA SM LETTER 95-15

H-2782 UPDATE

The Governor's office has decided not to sign off on H-2782. The Governor will send the bill back to the legislature with amendments to include aesthetics and health, in addition to public safety, as criteria by which local governments may regulate towers.

In short, the Governor's advisers would like to see H-2782 look more like PRB-1. We have been reasonably well-served by PRB-1, and having the Massachusetts regulation look more like PRB-1 is probably in our best long-term interests.

WHAT'S NEXT:

Fortunately, the revised bill does not have to go through the 14-step legislative process again. The new draft of the bill will go straight to the House floor for a vote, then straight to the Senate floor for approval, then back to the Governor. This could go quickly if we all contact our Reps & Senators.

•THANK YOU! to everyone who has called the Governor's office in the last two days. This was our most successful squeaky-wheel effort to date. I hope you will all be able to make phone calls in the coming weeks as we push this through one more time. But...

Late Breaking News.... The House has approved the Governors changes. The Senate is expected to do the same, and by the time you read this, the bill may even be back on the Governor's desk.

[Courtesy K3HI, State Government Liaison, MA]

ARLX061 Call for microwave hams

A professional microwave engineering group will include Amateur Radio for the first time in its symposium.

The Institute of Electrical and Electronics Engineers' Microwave Theory and Techniques Society (IEEE MTTS) will hold its 1996 International Microwave Engineering Symposium in San Francisco June 17 to 21, 1996. The sponsors have approved and will officially sponsor a microwave Amateur Radio reception and swap meet, according to Jeffrey Pawlan, WA6KBL, who is active in the Society.

Licensed amateurs who have a bona fide interest in VHF-microwave experimentation as well as all Symposium attendees will be invited to the reception.

Also planned for the reception are live demonstrations of attendees' microwave equipment and antennas. The organizers hope to arrange live 2-way demonstrations of amateur stations on all bands from 2.4 to 76 GHz. Amateur Radio microwave clubs also are invited to display information on their activities, members' stations, and newsletters.

Those interested in participating should contact Pawlan as follows: electronic mail: jpawlan@pawlan.com; 24-hour facsimile: 408-371-4302; or write to 14908 Sandy Lane, San Jose, CA 95124.

ARLB096 FCC OKs closings plan

The FCC has approved a field office restructuring plan that it says will improve operations and save money. The plan, submitted to the Commissioners by FCC Chairman Reed Hundt on August 17, would automate the FCC's network of airwave monitoring stations and reduce the number of field offices and field personnel in the Compliance and Information Bureau (CIB).

The plan also will improve public information services by establishing a new toll-free national call center, the FCC said. The Commission's field enforcement activities would be maintained at current levels.

The plan would close nine separate attended high frequency monitoring stations, and three additional monitoring sites within FCC field offices. Technological advances permit the replacement of these monitoring stations with a national automated monitoring network by the summer of 1996, the FCC said, and "overall, monitoring capacities will be enhanced." One facility in Laurel/Columbia, Maryland, will remain as the network central station.

The new FCC Call Center would, for the first time, enable the public anywhere in the United States to call one toll-free number to reach the FCC for information or to report complaints. The Center will handle this function more efficiently, and with greater convenience to the public, than is now possible in the dispersed field offices, the FCC said.

The FCC said that, under the plan, authorized staffing in the CIB will decrease by about one-third by the beginning of FY 1997. The CIB plan will require an investment of 5 to 7 million dollars in equipment and personnel in fiscal years 1996 and 1997 and the Commission estimates it would save more than 8 million (in current dollars) annually thereafter.

Hundt said, "The CIB restructuring plan will enable us to enforce the rules that govern the nation's airwaves better and cheaper. We will also be able to provide information services to the public better and cheaper."

As is required for all major FCC reorganizations, the CIB restructuring plan must be reviewed by the House and Senate Appropriations Committees. At the same time, the FCC will begin required negotiations with the union that represents FCC employees.

More information is in November 1995 QST, page 92.

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	_____	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
VHF	_____	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
UHF	_____	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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

☐ Antennas
☐ Flea Market
☐ Receiver
☐ Publicity
☐ Transmitters
☐ Newsletter
☐ Logic
☐ Public Service
☐ Telephone
☐ Legal Aid
☐ Education:
☐ Technical Documentation
☐ Shelters
☐ Medical Aid
☐ Equipment Construction
☐ Meeting Set-up
☐ Equipment Transportation
☐ Social Events
☐ Technical Documentation
☐ Refreshment
☐ Schematic Drawing
☐ Technical Library
☐ Teach Code
☐ Teach Theory
☐ Repeater Tech Committee
☐ Special Projects
☐ Repeater Control Operator
☐ Association Officer
☐ Board of Directors
☐ Field Day
☐ Emergency Communications
☐ CW Operation
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
Newsletter Editor:	Andy Morrison, N1BHI
Associate Editor:	Walter Ching, N1HBR

To Contact Officers or Board Members Call MMRA Voice Mail Line:

508 - 489 - 2282
Toll Free from 508 and 617 Areas

MMRA E-Mail
mmra@mmra.org

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 (508) 489-2282. -- This is a local call from any 508 exchange phone, and is a free call from both 617 and 508 areas.

Newsletter Information	September issue	November issue	January Issue	March Issue	May issue
Mailing Date	Sept 14, 1995!	Nov 9, 1995	Jan 11, 1996	Mar 8, 1996	May 10, 1996
Submission Deadline	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: